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Corporate Governance and Environmental Accounting Reporting in Selected Quoted African Companies

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Abstract

Being a destination for investors around the globe, there are increasing concerns about climate change, pollution and biodegradation as well as the disposition of companies towards reporting environmental concerns in Africa. This necessitated the interest in a comparative study of corporate governance mechanisms and environmental accounting reporting (EAR) in selected African quoted companies. Using ex-post facto research design, the study's population comprised of quoted companies in six sectors located in four Africa countries (Egypt, Nigeria, Kenya and South Africa). A content analysis was carried out to obtain environmental disclosure and reporting score, while static panel regression model was used to analyse the data. Findings revealed that board committee has a significant influence on EAR in the African countries, board diversity in Kenya and Nigeria, board size in South Africa and Nigeria, board independence in Egypt and Kenya, and institutional ownership in Nigeria, Egypt and South Africa were found to have significant influence on EAR. This result implies that extant laws and codes on corporate governance should be followed, and most importantly, other countries studied should emulate South Africa and adopt integrated reporting and application of Global Reporting Initiative (GRI) index score in their corporate reporting.

Keywords

Environmental reporting, corporate governance, Africa, institutional ownership, content analysis

Introduction

The business community is a subset of the society; therefore, it has a moral obligation to the society. In the context of this study, an environment is regarded as surrounding influences and a natural world where we live, operate and earn our daily living. The business environment is very important; thus, its study and how it is managed must not be overlooked. The call for a sustainable business cannot be attained without paying adequate attention to the environment. A sustainable business environment is one that ensures a strong, healthy and just society. This, therefore, means meeting the different needs of all people in the existing and future communities, promoting individual well-being, social cohesion, inclusion and creating equal opportunity. Sustainable development is of four basic dimensions, namely economic, social, environmental and ethical dimensions (Sustainable Development Commission, 2011). From the environmental dimension, which is the thrust of this study, economic and social goals of an organization need to be pursued in a manner that little or no harm can be caused to the quality of the environment and also limit the exhaustion of irreplaceable resources (Stern, 2006).

The fast-changing business environment has made corporate governance to be taken seriously than ever. The effects of industrialization, oil extraction, gas flaring, farming, mining, manufacturing and agro-allied services on the environment are giving serious concern to all the players in the business sector. Increased climate change, greenhouse gas (GHG) emissions, pollution, biodegradation, non-biodegradation, global warming, etc. have led to a lot of environmental and social issues. As expressed in the study of Osemene and Olaoye (2009), dangerous hydrocarbons from oil spillage and mining activities, fumes from machinery and generating plants; which are harmful to man and other living organisms are often emitted into the air in the course of economic pursuits and activities. The explosion of population, urbanization, affluence, new technologies, industrialization and diversification of the economy are leading to serious concerns for the care of the environment. Consequently, there is an increased global concern for sustainable development and call for firms to be environmentally friendly and sensitive (Asaolu & Osemene, 2009; Campos-Soria et al., 2021; Chaklader & Gulati, 2015; Yilmaz & Can, 2020). A clean and qualitative environment is inevitable for businesses to thrive. This incidentally impacts owners of business, as businesses need people to thrive and be sustained in the long run. Where healthy environment is lacking, survival of business and operators becomes unpredictable, while achievement of set objectives becomes almost impossible. Furthermore, many corporations often fail to include the impact of their operations on the environment in the financial statements probably because of the high cost perceived to be involved. Agitations and disturbances from host communities also pose serious threats for the survival of those corporations in the future. In the quest to care for the environment, accounting and reporting are brought to the front burner because accounting helps to record and report the financial position and performance of an entity. It keeps the users informed and educated about the company they have an interest or stake in.

Information disclosed under corporate responsibility reports are incoherent in that they fail to bring out clear linkages between economic drivers, financial information and social and environmental impacts of corporate strategies (PwC, 2012). Corporate disclosure of information on activities that have impact on the environment are on the increase, but gaps still exist on what constitutes key information to be disclosed and reported (Umoren et al., 2015; Senn & Giordano-Spring, 2020). A possible reason for this limitation is that there could be a lack of ability and expertise within the decision-makers (Kruger, 2009). More so, with the complex nature of today's business world, the need for a diverse board becomes imperative. Users of financial information need adequate data to assess and evaluate whether the entities are financially, socially and environmentally responsible. Thus, corporate governance attributes such as board committees, board diversity, board size, non-executive directors (NEDs) and institutional ownership structure have a vital role to play in achieving these, since they affect how corporations are directed, governed and administered. Hence, a study of this nature is germane to address the identified challenges. The rest of the article is structured as follows: the next section reviews conceptual, theoretical and empirical literature related to the study. The objectives and the rationale of the study are given in the third and fourth sections, respectively. The methodology adopted and the operationalization of variables are discussed in the fifth section. The next section provides the empirical results obtained and its discussion. Finally, conclusions are given in the penultimate section, while implications and suggestions for future research are provided in the final section.

Review of Literature

Environmental Accounting Reporting

Environmental accounting reporting (EAR) is described as green accounting, carbon accounting and reporting, social accounting, corporate social responsibility (CSR) and sustainability reporting (Deegan & Ranking, 1996; Goswami, 2014; Ijeoma, 2015; Maama-Green, 2016; Portella & Bora, 2020; Van-Zyl, 2013; Wild & Van-Staden, 2013; Wong, 2011). EAR is an avenue through which corporations present and disclose their environmental and societal activities to the public. It is a means of communicating their various environmental activities and involvement with the immediate community, especially the host community to stakeholders. Environmental accounting, therefore, aims at achieving sustainable development, maintaining a favourable relationship with the community and pursuing effective and efficient environmental conservation activities (Adediran & Alade, 2013, Marrone et al., 2020). This process gives the business managers the ability to identify environmental costs and the benefits therein, thus providing the best suitable and possible measurement basis in quantitative terms and communicating the results thereof. As opined by Peskin (1989), environmental accounting is viewed as a tool that can be employed to determine less tangible and external costs for activities, like biodiversity, human health and aesthetic values. In broad terms, it is aimed at implementation of sustainable business practices to preserve and conserve natural resources for future generations. In this study, therefore, EAR entails the financial and non-financial, qualitative and quantitative, physical and monetary information relating to corporate environmental performance and measurement to ensure a sustainable business.

Corporate Governance

The survival and sustenance of any organization depends largely on their corporate governance structure. Strong and reliable corporate governance is the firm's indispensable financial reporting structure. Corporate governance is much broader than just corporate management but includes a fair, efficient and transparent administration to meet certain well-defined objectives (Badi & Badi, 2012). It is about giving direction and leadership, controlling and monitoring the management decisions to ensure the goals of the corporation is achieved.

Good corporate governance is a system of managing the affairs of corporations with a view to increasing shareholder value and meeting the expectations of the other stakeholders (Shleifer & Vishny, 1997). Corporate governance systems can be addressed by examining to what extent they incorporate two different corporate worldviews, namely communitarianism and contractarianism. Communitarianism considers that companies are social beings that are socially and environmentally responsible beyond just the maximization of corporate financial performance. They support the stakeholders' theory. This perception is common in European countries, as they exhibit acts of protecting the interests and rights of employee, environment and society. The supporters of contractarianism view companies as a nexus of contracts between the agents and shareholders for the maximization of shareholders wealth. This is common in the US and Anglo-American countries (Gallego-Alvarez et al., 2017). It, therefore, shows that a well and completely structured mechanism of corporate governance from the communitarianism point of view would enhance EAR, as it is an indispensable financial reporting structure.

Good corporate governance around the globe is supported by laws. In Nigeria, for instance, the Companies and Allied Matters Act (2004), Securities and Exchange Commission also issued a code of corporate governance which stipulates that all public companies listed on the Nigerian Stock Exchange comply with the provisions and principles of the code, as it forms the minimum standard of their corporate behaviour and actions. There is also a more general set of codes of

corporate governance issued by the Organisation for Economic Cooperation and Development (OECD). Sarbanes Oxley Act, 2002 is in use in the USA, while in the UK, voluntary guidelines or code of corporate governance principles and practices is in place. In South Africa, King III report on corporate governance, Johannesburg Stock Exchange (JSE) listing requirements and Companies Act 71 of 2008 are in place. Egypt has the Company Law 159/1981 and the Capital Market law No. 95 of 1992. Aside from these laws, the Egyptian corporate governance code issued by Egyptian Institute of Directors is also in existence. In Kenya, the statutory law governing corporate governance in public listed companies is embodied in the Companies Act 1962 c.486. Other rules that govern Kenya's corporate governance are the Capital Markets Authority Act 2002, the Nairobi Stock Exchange (NSE) rules and the Penal Code c.63.

The dimensions of corporate governance and its measurement are diverse. These dimensions include board committee, board diversity, board size and board independence. Theses dimensions can collectively be referred to as board characteristics.

Board Characteristics

In an attempt to drive corporate governance, corporations constitute committees will help the administration with the governance of the corporations to work effectively and efficiently. Thus, corporate responsibility committee, audit committee, environmental committee or risk management committee as a board committee is a sign of companies' involvement in environmental concerns (Ionel-Alin et al., 2012; Odia, 2014). The board committees are responsible for monitoring, reviewing the integrity of the financial statement, the effectiveness of the accounting internal control and business risk system, including environmental issues. Similarly, board diversity has been used in literature, and it is described as heterogeneity among board members and has an infinite number of dimensions ranging from age to nationality, religious background to functional background, task skills to relational skills and from political preference to sexual preference (Amorelli & García-Sánchez, 2020; Beji et al., 2020; Hassan et al., 2020; Horton et al., 2012; Khatib et al., 2021; Van Knipperberg et al., 2004). A board that is made of people with different ethnicity, age, gender, geographical background, technological know-how and class is assumed to be concerned with matters that concern the environment.

Board size is another dimension of corporate governance. Board size allows for a large number of members with diverse experience and expertise on the board and is associated with the communication of environmental information (Agyemang et al., 2020; De-Villiers et al., 2011). Mixed results on this dimension are notable in literature (Coffie et al., 2017; Kolsi, 2017; Moussa, 2019; Oba & Fodio, 2012; Odia, 2014; Trireksani & Djajadikerta, 2016). Furthermore, board independence is another which emphasises that independent directors have a significantly higher level of voluntary disclosure than companies with a balanced board (Agyemang et al., 2020; Cheng & Courtenay, 2006). The independence of the board is usually measured by the presence of NEDs; this is due to the fact that they are considered a mechanism for governance which helps to ameliorate agency conflicts between owners and the agents.

Institutional Characteristics

Institutional ownership has been considered as a key part of effective control over a company and an influential structure of corporate governance that is used to influence social, ethical and environmental matters as a result of their substantial shareholdings (Alnabsha et al., 2018). They comprise powerful and legitimate stakeholder group for companies and as such affect companies'

management strategies in relation to environmental disclosures (Cotter & Najah, 2012). When there is the presence of powerful stakeholders in a company, the company will be more thoughtful in managing and dealing with those stakeholders (Filatotchev et al., 2005). Institutional investors seek greater accountability, transparency and a higher standard of corporate behaviour towards the community and the natural environment (Bose et al., 2017; Cotter & Najah, 2012). However, there have been varied results on this dimension (Ahmed et al., 2017; Barnea & Rubin, 2010; Bose et al., 2018; Garcia-Meca & Pucheta-Martinez, 2017; Odia, 2014; Shahab & Ye, 2018).

Theoretical Background

The theories that underpin this study are the stakeholders' theory and social contract theory. The stakeholders' theory was the ideology of Johnson (1971) who conceived that a socially responsible firm is one that balances a multiple of interests alongside that of the shareholders, which while striving to achieve larger profits for the owners, also considers the interests of the employees, suppliers, investors, local communities, and the society at large. It argues that agents who are managers to companies are saddled with the moral obligation to consider all stakeholders' interest and balance appropriately the same. Freeman (1984) further developed the theory and explained that a stakeholder is any individual or group that can affect or be affected by the activities, achievements, and actions of an organization's objectives.

Stakeholders' theory has become an ethics-based theory in corporate governance, which states that a company's board of directors owes a duty to all major stakeholders in the company, including not just employees and customers, but also the shareholders whose resources they manage, that is, communities and society as a whole. This duty is cut across all individuals or groups who can substantially affect, or be affected by, the welfare of the firm (Jensen, 2001). This theory establishes that a relationship exists between corporate governance and EAR. Stakeholders' theory stands as a basis for the management of stakeholders' interest. The cornerstone of the stakeholders' theory is the decisions made by the management of the company from time to time and strategies adopted for the implementation of these decisions for meeting the requirements of the maximum number of stakeholders regarding their monitoring and non-monitoring considerations by ethical means. Thus, the inclusion of environmental issues through EAR by the board of directors is an execution of adequate financial reporting to the stakeholders' theory perspective, as suggested by Hörisch et al. (2020).

Similarly, the social contract theory was an extrapolation from the political social contract theory. It was propounded by John Locke (1632–1704) who argued in favour of representational democracy, business–society relationship and social responsibilities of businesses (Aras & Crowther, 2008; Hasnas, 1998). The legitimacy theory also aligns with the assumption of a social contract existence between firms and the society they operate in (Mensah et al., 2017). It is based on the view that members of the society give legal recognition to a company to exist and act as a legal person within the society. They also allow a company to use land and resources and to hire members of society as employees (ACCA, 2013).

Empirical Evidence

For over 40 decades, a lot of studies have been conducted on environmental accounting topics ranging from environmental cost disclosures, determinants of environmental costs and level of environmental reporting. Most of these studies are on developed countries such as the UK, the

USA and Germany, but studies on developing African countries such as Nigeria, Egypt and Kenya have been mostly inconclusive. Some of the previous studies are discussed in this study.

Studies on developed countries include Ghazali (2007); Rao et al. (2012); Ionel-Alin et al. (2012); Rao and Tilt (2016); Trireksani and Djajadikerta (2016); and Shahab and Ye (2018) among others, and they investigated corporate governance determinants and their impact on EAR. Rao and Tilt (2016) conducted a study on the relationship between corporate governance, in particular, board diversity and CSR reporting among the top 150 listed companies in Australia over a 3-year period using content analysis and regression analysis. The study revealed that three of the board diversity attributes (gender, tenure and multiple directorships) and the overall diversity measure have the potential to influence CSR reporting. However, the relationship between independent/NEDs and CSR disclosure was not clear. Other studies in support of board diversity and firm performance are Carter et al. (2003), Rose (2007) and Carter et al. (2010).

Furthermore, while examining the impact of corporate governance dimensions using generalized least squares (GLM) method, recent studies by Shahab and Ye (2018) on CSR disclosure in organizations with the implementation of neo-institutional theory in the Chinese firms' context found that high percentage of state ownership in the Chinese firms results in low level of CSR disclosure, institutional ownership, independent board of directors and large board size, which lead to increased CSR. The study revealed also that block ownership is associated with a reduction in CSR due to a shift in the priorities of management towards the realization of extra profit for the owners. This is at variance with the study of Ghazali (2007) which studied the influence of ownership structure on corporate social responsibility disclosure (CSRD) in Malaysian company annual reports. The result of the study showed that owner-managed companies (directors hold a higher proportion of equity shares) disclosed significantly less CSR information, while companies in which government is substantial shareholders disclosed significantly more CSR information in their annual reports.

Hussain et al. (2018) conducted a study to investigate the relationship between corporate governance and the triple bottom line sustainability performance on sustainability reports of US-based companies, and it was revealed that diversity in gender does not have any significant impact on environmental performance but that independent board with a designated CSR committee that meets more frequently is better able to monitor management decisions regarding environmental and social issues. While also investigating diversity in gender, Shakil et al. (2020) found a significant and positive relationship between the diversity of the board of US banks and environmental, social and governance (ESG) variables. However, the findings suggest that ESG controversies have no major moderating impact on the gender diversity–ESG success nexus across the board.

On the other hand, Brammer and Pavelin (2006), Cho et al. (2010), Goosen (2012), Chariri et al. (2017), Niresh and Silva (2018) and others studied effect of firm specifics and financial performance on EAR. Brammer and Pavelin (2006) examined the variation across firms in the incidence and nature of voluntary environmental disclosures in the content of a sample of 450 UK companies in 2000. The study employed ordered probit estimation model and found that larger, less indebted companies with dispersed ownership are significantly more likely to make voluntary environmental disclosures and that the quality of disclosure is positively related with firm size and corporate environmental impact. Relying on prior works in environmental disclosure and corporate impression and using a cross-sectional sample of 190 firms of US 10-K for the year 2002, Cho et al. (2010) investigated whether there are self-giving biases present in the language and verbal tone

used in corporations' environmental disclosure. It was found that worst environmental performance is associated with the use of more optimistic language, and that environmental performance measure is negatively related to the certainty scale of the disclosure. Goswami's (2014) study also supported this view. Goosen (2012) further reviewed the multidisciplinary interrelationships between sustainable development, human health and the environment globally. The study revealed that commitments, skill and character of environmental managers are vital in order to improve sustainability reporting.

Other studies such as Latan et al. (2018) examined the effects of the combination of corporate environmental strategy, top management commitment and environmental uncertainty with a focus on the role of environmental management accounting (EMA) on corporate performance of 107 responses in ISO14001 certified companies listed in Indonesia Stock Exchange. The study showed that a positive significant influence exists between the organizational resources on the use of EMA, which in turn can improve the environmental performance of companies. Radhouane et al. (2018) studied environmental reporting implication in terms of customer-related performance and market-related performance (customers and shareholders) in France from 2007 to 2011 for 120 companies using generalized method of moments (GMM) approach. The results showed that the level of environmental reporting is negatively and significantly associated with customer-related performance (sales growth and profit margin) and positively and significantly associated with market-based performance, measured by Tobin's Q.

Furthermore, Niresh and Silva (2018) studied the link between CSRD and financial performance of companies quoted on the banks, finance and insurance sectors in Sri Lanka using content analysis. It revealed that there is a significant association between corporate social responsibility disclosure (CSRD) and future financial performance of the selected companies. Ahmad et al. (2018) studied the relationship between environmental accounting and non-financial firms' performance listed in the Pakistan Stock Exchange. The study adopted regression analysis for company's annual data from 2006 to 2016 and found that there is a strong positive relationship between environmental accounting and firm's size, while other firm's performance (EPS, ROCE) is found to have an irrelevant association with an environmental cost. This is in agreement with the study of Akanno et al. (2015) and Atan et al. (2017).

From the past studies conducted in the developed countries, findings revealed that corporate governance mechanisms, firm specifics and financial performance indicators on EAR provided varied results. These differences could be due to factors such as methodology used, sample size and instrument of analysis. On the one hand, several studies from the developing countries such as Oba and Fodio (2012), Uwuigbe (2012), Bassey et al. (2013), Odia (2014), Ofor and Odesa (2016), Osemene et al. (2016) and Coffie et al. (2017) among others dealt with corporate governance, firm specifics, financial performance and their relationship with EAR.

On the other hand, Uwuigbe (2012) studied web-based corporate environmental reporting (CER) of 30 listed financial and non-financial firms in Nigeria. Using linear regression analysis, the study applied content analysis to measure the relationship between the size of the firm and the level of corporate disclosure; it revealed that there is no significant difference in the level of web-based CER between the sampled firms. Moreover, Ofoegbu and Megbuluba (2016) studied the influence of firm characteristics on the quality of corporate environmental accounting information disclosure (CEAID) in Nigeria. The study employed pooled data least square regression model on 10 selected quoted manufacturing firms from 2008 to 2014, and the results showed that companies' financial performance has a positive and significant influence on the quality of CEAID, though the quality

is poor based on the standard (Global Reporting Initiative (GRI) and ISO 14301 environmental requirement). Also, firm size has no impact on the quality of CEAID.

Using binary regression analysis, Ofor and Odesa (2016) assessed the factors that influence disclosure of environmental cost among 100 listed companies in Nigeria, and it was revealed that environmental information disclosure is positively associated with company leverage, audit type, foreign listing and industry type and negatively associated with large sized firms, while profitability does not statistically influence environmental cost disclosure of quoted firms in Nigeria. This result is in disagreement with Egbunike and Tarilaye (2017) who also examined the association between firm's specific attributes (firm size, earnings, leverage and governance) and voluntary environmental disclosure evidenced from listed manufacturing companies in Nigeria. The study employed a robust regression analysis and found out that there is a positive relationship between environmental disclosure, firm size, leverage, earnings per share (EPS) and governance of the studied manufacturing companies in Nigeria. In addition, using descriptive and classical linear regression model, Umulkher and Muganda (2017) studied the determinants of environmental accounting disclosure among listed manufacturing and allied firms in Kenya and revealed that less levered firms publish more on environmental accounting disclosure, while firms audited by the big four auditors are more inclined to disclose more environmental information. The difference in the findings could be based on methodology and instrument of analysis.

Furthermore, Abogun et al. (2015) studied the relationship between the disclosure of environmental information and performance of 36 selected quoted companies in Nigeria. They observed that there is a significant negative relationship between environmental accounting, return on capital employed (ROCE) and asset turnover and a significant positive relationship between environmental accounting and net profit margin and EPS. Furthermore, using panel data regression analysis, Osemene et al. (2016) studied the relevance of environmental accounting practices in sustainable development and performance of listed manufacturing companies in Nigeria and revealed the existence of a positive relationship between sustainable development, return on equity and return on assets, as well as a positive relationship between environmental accounting and return on equity.

In addition, Adekanmi et al. (2015) studied the level of EAR practice of 50 listed firms in Nigeria from 2005 to 2012; the study showed that aggregate environmental reporting was 37%, which showed that the level of EAR is not high in Nigeria. Musa et al. (2015) further assessed the environmental accounting disclosure practice of Nigeria quoted companies in the consumer goods sector using content analysis and ANOVA. The study revealed that as a result of the absence of standards, different companies disclose environmental accounting information based on industry best practices, pressure from environmental activists/advocates and relationship with the parent company. Umoren et al. (2015) investigated the ESG practices of Nigeria quoted companies discussing the need for integrated reporting using regression analysis. The study revealed that audit type influences ESG practices and not company size and profitability, and that environmental disclosure was least disclosed, with social disclosure topping the list of disclosures. Mensah et al. (2017) on the other hand, ascertained the environmental accounting practices among listed manufacturing companies in Ghana using content analysis based on an evaluation matrix. The study showed that the amount of environmental disclosure on the activities of listed manufacturing firms was low, but both quality and quantity of environmental information kept increasing significantly over the years. Ultimately, in their study on corporate EAR conducted on four cement companies listed in Nigeria stock exchange, Aruwa and Ame (2015) revealed that the most

significant reason for companies not to embrace EAR is lack of awareness by stakeholders and lack of pressure from the stakeholders on companies to report on environment issue. Thus, a lot of studies have been conducted on environmental accounting topics ranging from environmental cost disclosures, determinants of environmental costs and reasons for and level of environmental reporting. However, the findings of these studies are inconclusive as to the certainty of the corporate governance determinants' influence on EAR, while comparative studies from Africa are sparse, a gap this study fills.

Objectives

This research is a comparative study of the influence of corporate governance variables on EAR in selected quoted companies of some African countries. Given that environmental concerns in Africa are on the increase, the study explores corporate governance in examining the disposition of selected African companies towards this concern. Specifically, the study examines the influence of corporate governance characteristics (board committee, board diversity, board size, board independence and institutional ownership) on EAR in six selected African countries.

Rationale of the Study

Africa is widely considered a unique continent given its market population of 1.2 billion persons with a projected growth of 2.6% in 2019 (World Bank, 2019). As the continent is a destination for investors whose activities may have rippled effect on the environment, it is, therefore, imperative to examine the influence of corporate governance variables on EAR. This is a longitudinal study that spans from 2011 to 2017, having both time and cross-sectional dimensions of the selected quoted firms across Africa (Egypt, South Africa, Kenya and Nigeria), which are the North, South, East and West regions of Africa, respectively.

Methodology

Research Design

This is a comparative study on the influence of corporate governance variables as determinants of EAR in selected quoted companies of some African countries. The unit of analysis is the corporate governance variables which include board committee, board diversity, board size, board independence and institutional investors. This study employed the ex-post facto research design, as it permitted the examination of independent variables in retrospect for their possible relationship with the dependent variables.

Population and Sample Selection

The study population comprised quoted companies in six sectors located in four countries, namely Egypt, South Africa, Kenya and Nigeria. These four countries are among the biggest economies in Africa based on gross domestic product (GDP) ranking, which is one of the indicators used by World Bank (2018). Table 1 shows the sectors and the population of the listed companies in each sector as on 30 September 2018. The sectors were chosen because of the sensitive nature of business activities on the environment and the impact they have on the environment.

Using stratified sampling, a sample size of 30% was applied on the entire population of the countries (South Africa, Kenya and Nigeria), while homogenous purposive sampling methods was used for selecting the sample from Egypt following the characteristics of the strata (Pondent, 2017; Singh, 2006). The samples chosen were specifically obtained from companies with annual reports in English Language. Table 1 also shows analysis of the samples from each stratum. Secondary data were obtained from annual reports of the quoted companies and information from the corporations' websites. In addition, data about the selected African countries were gathered from the African markets' websites.

Table 1. Population (Sample) of Quoted Firms in the Different Sectors of the African Countries.

Sectors/Countries	Egypt Sample	South Africa Sample	Kenya Sample	Nigeria Sample
Basic materials	25(0)	8(2)	4(1)	11(3)
Consumer goods	44(2)	16(5)	13(4)	26(8)
Health care	16(1)	3(1)	NIL	10(3)
Industrial	52(4)	19(6)	7(2)	25(8)
Oil and gas	2(1)	10(3)	2(1)	13(4)
Technology/telecommunication/utilities	7(2)	2(1)	4(2)	7(2)

Source: The authors.

Data Description

Both qualitative and quantitative data were used in this research. Content analysis was used because it allows corporate environmental information to be classified and compared systematically and commonly used to measure corporate environmental disclosure in annual reports (Branco & Rodrigues, 2006). However, to measure the environmental disclosure and reporting, themes and evidence used were adopted from the studies of Hackson and Milne (1996) and Uwuigbe et al. (2011). The themes are measured in six categories, namely environment, energy, product, consumers, community involvement and employee's health, while the evidences are based on monetary, non-monetary and declaratives. A checklist comprising of 22 environmental voluntary disclosure items was prepared based on the information obtained from the annual reports and the corporations' websites. In scoring the items, a dichotomous approach was adopted wherein if a disclosure was made, a score of 1 was recorded and, if otherwise, a score of 0. This approach is a conventional procedure and had been used successfully in prior studies (Hackson & Milne, 1996; Nag & Bhattacharyya, 2016; Trireksani & Djajadikerta, 2016; Umulkher & Muganda, 2017; Uwuigbe et al., 2011). The formula for computing the environmental disclosure and reporting score (EDRS) is thus

$$\text{EDRS} = \sum_{t=1}^{n} \frac{d_i}{d}$$

where

EDRS = environmental disclosure and reporting score;

d = 1 if item is disclosed and d = 0 if item is not disclosed;

n = number of items which might be disclosed by a sample company and has a maximum of 22 items.

In order to arrive at the value of EDRS for each company sampled, the ratio of the maximum number of points obtained by the company to the total expected number of items to be disclosed by the firms (22 items) is computed. The result then represents the study's dependent variable for EAR.

The static panel data regression model was used to analyse the data gathered; this includes pooled OLS, fixed effects (FE) model and the random effect models. Furthermore, due to the presence of heteroscedasticity in some countries' data, panel data GLS estimation has been used in this study (Gujarati, 2013).

Operationalization of Variables

Following extant literature discussed in the review section, Table 2 presents the explained and explanatory variables used to test the hypotheses formulated for the study.

Table 2. Measurement and Description of Explained and Explanatory Variables.

Variable	Measure	Expected Sign
Earindex (environmental accounting reporting)	Ratio of the environmental disclosure and reporting score (see Hackson & Milne, 1996; Uwuigbe et al., 2011)	
Bdcomm (board committee)	1 if the company has committee on environmental issues or CSR and 0 if otherwise (see Odia, 2014)	+
Bddiv (board diversity)	1 if the member has at least 4 of the attributes used to measure overall diversity (ethnicity, geographical background, member of outside board, experience, age and gender) and 0 if otherwise (see Hassan et al., 2020; Horton et al., 2012)	+
Bdsize (board size)	Proportion of members on the board (see Moussa, 2019; Uwuigbe et al., 2011)	+
Bned (board non-executive directors)	Proportion of non-executive directors to total directors on the board (see Cheng & Courtenay, 2006)	+
Instown (institutional ownership)	percentage of shares held by an investment fund to a total number of shares in the corporation (see Shahab & Ye, 2018)	+
Ita (firm size)	Natural log of total assets (see Ahmad et al., 2018; Chariri et al., 2017)	+
Prof (profitability)	Return on equity measured as ratio of net income to shareholders' equity (see Ofor & Odesa, 2016)	+
Coyage (company age)	1 if the firm is listed on the floor for over 10 years and 0 if listed less than 10 years (see Ahmad et al., 2018; Ravi et al., 2017)	+

Source: The authors.

Results

Tables 3 and 4 illustrate descriptive statistics, correlation matrix and variance inflation factor (VIF) for the countries. The mean scores of the EAR index scores are 0.683, 0.805, 0.737 and 0.659 for Egypt, South Africa, Kenya and Nigeria, respectively. This implies that EAR is high in South Africa, followed by Kenya, then Egypt and in Nigeria on the average of 65%. The minimum and maximum number of board of directors in Egypt are 0 and 16, respectively, with an average of 11 directors on the board. South Africa has a minimum of 4 and maximum of 16 with an average number of 10 directors, while in Kenya and Nigeria, their minimum and maximum number of directors are 5 and 13, 6 and 15, respectively, with a mean number of 9 directors on their board. This implies that the board size in African quoted firms is comparatively large. On the contrary, the proportion of NEDs to the board size is relatively small with an average of 2 NEDs in the African quoted firms.

Table 3. Descriptive Statistics.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Obs.	Mean	Std. Dev.	Min.	Max.
	Egypt					**South Africa**				
Earindex	70	0.683	0.173	0	0.82	126	0.805	0.115	0.45	0.95
Bdcomm	70	0.857	0.352	0	1	126	0.809	0.394	0	1
Bddiv	70	0.657	0.478	0	1	126	0.833	0.374	0	1
Bdsize	70	11.757	3.333	0	16	126	9.642	2.609	4	16
Pned	70	0.712	0.216	0	0.91	126	0.701	0.120	0.3	0.87
Instown	70	25.243	29.137	0	87.18	126	51.512	21.248	12.04	95.64
Prof	70	0.170	0.476	–0.6	2.54	126	–0.011	0.413	–2.78	0.91
Coyage	70	0.9	0.302	0	1	126	0.626	0.485	0	1
Lta	70	8.578	1.409	6.66	10.99	126	11.335	2.258	7.92	15.76
	Kenya					**Nigeria**				
Earindex	70	0.737	0.142	0.5	0.95	196	0.659	0.367	0.05	1.27
Bdcomm	70	0.8	0.402	0	1	196	0.836	0.370	0	1
Bddiv	70	0.871	0.337	0	1	196	0.836	0.370	0	1
Bdsize	70	8.514	2.019	5	13	196	9.020	2.063	6	15
Pned	70	0.765	0.151	0.4	0.92	196	5.002	4.177	0	13.71
Instown	70	54.022	17.875	27.97	88.43	196	40.881	31.080	0	94.89
Prof	70	0.131	0.327	–0.9	1.28	196	0.072	2.708	–26.81	25.55
Coyage	70	0.9	0.302	0	1	196	0.887	0.316	0	1
Lta	70	10.024	1.470	7.36	12.74	196	9.670	2.168	2.88	13.85

Source: The authors.

Multicollinearity and Heteroskedasticity Tests

Tables 4 and 5 show clearly that the correlations among predictor variables are not high for Egypt, South Africa and Kenya except for Nigeria where the highest correlation reported was between NEDs and institutional shareholding of >0.90. Therefore, to solve for the multicollinearity problem, one of the variables was dropped. The VIF results also buttress the correlation result, as only Nigeria had variables that are above the threshold of 10 (Gujarati, 2013). In Egypt, a positive relationship exists between the dependent variable and the independent variables. In South Africa, except for board diversity, institutional ownership and firm size, a positive relationship exists among the other independent variables and EAR. Furthermore, in Table 5, institutional ownership and company age have a negative relationship with the dependent variable in Kenya, while in Nigeria, there exists a negative relationship among NEDs, institutional ownership and profitability and the dependent variable.

The results of the Breusch–Pagan/Cook–Weisberg test for heteroscedasticity were $p >$* 0.5042 and $p > 0.92$ for Egypt and Kenya, respectively. This is in excess of 0.05; thus, the null hypothesis is accepted, which implies that there is uniform variance and the estimates are not biased. The pooled OLS, FE and random effects models have been applied. The results of the Breusch–Pagan/Cook–Weisberg test for heteroskedasticity were $p > 0.000$ and $p > 0.0398$ for South Africa and Nigeria, respectively, indicating the presence of heteroscedasticity since the *p*-values are less than 0.05. Due to the difference in the spread of mean, the panel data GLS estimation has been applied.

Table 4. Variance Inflation Factor (VIF) and Correlation—Egypt/(South Africa).

	VIF	Earindex	Bdcomm	Bddiv	Bdsize	Pned	Instown	Prof	Coyage	Lta
Earindex		1.000								
		(1.000)								
Bdcomm	2.49	0.342	1.000							
	(1.280)	(0.323)	(1.000)							
Bddiv	1.96	0.288	0.565	1.000						
	(1.24)	(–0.109)	(–0.216)	(1.000)						
Bdsize	3.05	0.720	0.500	0.238	1.000					
	(1.84)	(0.509)	(0.096)	(–0.135)	(1.000)					
Pned	1.87	0.543	0.501	0.489	0.355	1.000				
	(1.700)	(0.355)	(0.248)	(0.002)	(0.465)	(1.000)				
Instown	1.60	0.289	–0.037	0.200	0.352	0.164	1.000			
	(1.52)	(–0.101)	(–0.301)	(0.215)	(0.116)	(–0.304)	(1.000)			
Prof	1.40	0.165	0.136	0.211	0.210	0.081	0.359	1.000		
	(1.26)	(0.321)	(–0.053)	(–0.158)	(0.362)	(0.053)	(0.128)	(1.000)		
Coyage	2.16	0.514	0.272	0.060	0.666	0.413	0.216	0.032	1.000	
	(1.13)	(0.017)	(–0.039)	(0.183)	(0.152)	(–0.038)	(0.053)	(0.100)	(1.000)	
Lta	1.63	0.201	0.255	0.358	0.405	0.364	0.159	0.400	0.220	1.000
	(1.27)	(–0.349)	(–0.228)	(0.088)	(–0.287)	(–0.120)	(–0.225)	(–0.209)	(0.008)	(1.000)

Source: The authors.

Table 5. Variance Inflation Factor (VIF) and Correlation—Kenya/(Nigeria).

	VIF	Earindex	Bdcomm	Bddiv	Bdsize	Pned	Instown	Prof	Coyage	Lta
Earindex		1.000								
		(1.000)								
Bdcomm	3.48	0.042	1.000							
	(1.48)	(0.492)	(1.000)							
Bddiv	1.45	0.103	–0.192	1.000						
	(1.25)	(0.417)	(0.327)	(1.000)						
Bdsize	2.79	0.555	0.199	0.098	1.000					
	(2.64)	(0.550)	(0.245)	(–0.022)	(1.000)					
Pned	3.32	0.387	0.261	–0.203	0.502	1.000				
	(21.20)	(–0.093)	(–0.324)	(–0.242)	(–0.494)	(1.000)				
Instown	2.44	–0.080	0.274	0.148	–0.177	0.113	1.000			
	(17.50)	(–0.067)	(–0.269)	(–0.244)	(–0.265)	(0.940)	(1.000)			
Prof	1.35	0.274	–0.080	0.117	0.119	–0.062	0.186	1.000		
	(1.00)	(–0.018)	(0.033)	(–0.011)	(0.010)	(–0.008)	(–0.007)	(1.000)		
Coyage	5.91	–0.501	0.666	–0.128	–0.152	–0.258	0.427	–0.149	1.000	
	(1.52)	(0.271)	(0.455)	(0.236)	(0.113)	(–0.315)	(–0.367)	(–0.014)	(1.000)	
Lta	2.71	0.905	0.008	0.275	0.628	0.385	–0.009	0.297	–0.408	1.000
	(1.23)	(0.611)	(0.272)	(0.243)	(0.237)	(–0.260)	(–0.239)	(–0.020)	(0.330)	(1.000)

Source: The authors.

Regression Results

The Hausman test for Egypt showed a $p > 0.0000$ and the Breusch–Pagan Lagrange Multiplier (LM) test for random effect produced a chi-square of 96.12 with *p*-value of 0.0000; thus, the null hypothesis is rejected and the FE model becomes appropriate. The FE showed *R*-squared of 94%, which measured the proportion of the change accounted for in the dependent variable by all the independent variables included in the model. The *p*-value 0.0000 of the *F*-statistics shows that the model is a good fit. In Kenya, the result of the Breusch–Pagan LM test for random effect produced a chi-square of 1.26 with *p*-value of 0.1310. This is in excess of 0.05; thus, pooled OLS becomes appropriate. The *R*-squared of 91% specified that the model is significant and the remaining 9% are controlled by other factors not included in the model. With a *p*-value of 0.0000 for the *F*-

statistics, the model is well fitted. South Africa and Nigeria also had *F*-statistics of 0.0000 and large values of Wald chi-square of 87.07 and 263.31, respectively.

The control variables of profitability, firm size and company age were included in the model to help enhance the predictability and explain the level of relationship while analysing the explained and explanatory variables. From Table 6, it is implied that there is a positive relationship between profitability and EAR index score for Egypt, Kenya and South Africa. Though only South Africa shows a significant positive relationship because the *p*-value is less than significant level of 5%, a negative relationship though not significant exists between profitability and EAR in Nigeria because the *p*-value 0.744 is greater than the significant level of 10%. This shows that profitability of a firm affects EAR inversely or directly.

In Kenya, there is a significant negative relationship between company age and EAR index score, as the result shows that 1% increase in the age of a company leads to 19% decrease in EAR. In South Africa and Nigeria, there is no significant relationship between EAR index score and company age, as shown by their coefficient values of −0.0096 and −0.0919 and the *p*-values of 0.850 and 0.328, respectively. No result was recorded for Egypt, as the variable was omitted due to collinearity.

Firm size, which was taken as the natural logarithm of total assets, showed a positive relationship between EAR and it. Specifically, there is a significant relationship between LTA and EAR for both Kenya (β=0.0815) and Nigeria (β=0.0919) with p-values less than 1%.. This result is in accordance with the findings of previous studies by Bassey et al. (2013), Egbunike and Tarilaye (2017), Garde Sanchez et al. (2017), Ravi et al. (2017) and Ahmad et al. (2018). In South Africa, a negative relationship exists between the EAR index score and firm age with a *p*-value of 0.015. It shows that an increase in firm size by 1% leads to 0.96% increase in EAR. The result agrees with the previous literature of Umoren et al. (2015), Ofor and Odesa (2016) and Chariri et al. (2017).

Table 6. Panel Regression Result.

Variables	Egypt (FE)	Kenya (pooled OLS)	South Africa (GLS)	Nigeria (GLS)
Bdcomm	1.4524 (0.000)*	0.1238 (0.000)*	0.6191 (0.006)*	0.3703 (0.000)*
Bddiv	0 omitted	–0.0521 (0008)*	0.0204 (0.385)	0.2122 (0.000)*
Bdsize	0.3737 (0.184)	–0.0033 (0.458)	0.0164 (0.000)*	–0.0205 (0.024)**
Pned	–1.3011 (0.067)***	0.1165 (0.077)***	0.0507 (0.551)	dropped
Instown	–0.0040 (0.046)**	–0.0007 (0.167)	–0.0007 (0.089)***	0.0019 (0.002)*
Prof	0.0049 (0.637)	0.0087 (0.651)	0.0510 (0.017)**	–0.0021 (0.744)
Coyage	0 omitted	–0.1927 (0.000)*	–0.0033 (0.850)	–0.0638 (0.328)
Lta	0.0052 (0.709)	0.0815 (0.000)*	–0.0096 (0.015)**	0.0919 (0.000)*
Constant	–0.0233 (0.893)	0.1917 (0.011)	0.6953 (0.000)	–0.5555 (0.000)
Model statistic				
R-squared	0.94	0.91		
Prob. (*F*-stat)	0.0000	0.0000	0.0000	0.0000
Wald-chi square			87.07	263.31

Source: The authors.

Note: *, ** and *** Denote statistical significance at 1%, 5% and 10%, respectively.
Also, *p*-values are reported in parentheses.

Test of Hypotheses and Discussion

The first hypothesis is related to the presence of board committee on environmental matters and its effect on EAR in African quoted firms. From the regression results, it can be inferred that there exists a positive relationship between the dependent variable and the independent variable with coefficient values of 1.4524, 0.1238, 0.6191 and 0.3703 and the *p*-values of 0.000, 0.000, 0.006 and 0.000 significant at 1% level for Egypt, Kenya, South Africa and Nigeria, respectively. This implies that a 1% increase in the percentage of board committee will increase the firm's EAR index score by 145%, 12%, 61% and 37% in the respective countries. Therefore, a firm with the presence of a board committee promotes and encourages EAR, as the null hypothesis is rejected, since the *p*-values are less than the significant level of 0.01. Thus, we conclude that the variables are statistically significant. The findings are consistent with and reaffirm the results of previous studies of Ionel-Alin et al. (2012), Odia (2014), Coffie et al. (2017), Alnabsha et al. (2018) and Hussain et al. (2018). These studies affirmed a positive relationship between board committee and EAR. The stakeholders' theory is supported, as the board committee members owe a duty to all major stakeholders in the company.

The second hypothesis in the null form states that the absence of a diverse board has a significant effect on EAR in African quoted firms. The coefficient value of −0.0521 for Kenya shows an inverse relationship, while coefficient values of 0.0204 and 0.2122 show the existence of a direct relationship for South Africa and Nigeria, respectively. No result was obtained for Egypt, as board diversity was omitted due to collinearity in the data. The results, therefore, imply that 1% increase in board diversity for Kenyan firms will lead to a 5% decrease in EAR, while in Nigeria, 1% increase in board diversity leads to 21% increase in EAR. Based on the *p*-values of 0.0008 and 0.000 for Kenya and Nigeria, respectively, we conclude that there is a significant relationship between the independent variable and the dependent variable, since the significant level of 0.01 is greater than the calculated values. Thus, the null hypothesis is rejected, and from the results therein, a strong empirical support is provided in relation to the fact that the presence of board diversity has a significant effect on EAR. Our result agrees with the findings of these authors (Rao & Tilt, 2016; Rao et al., 2012). Theoretically, from stakeholders' perspective board of directors with diverse backgrounds have responsibilities towards the welfare of all stakeholders. However, in South Africa, the result is at variance with the findings for Nigeria and Kenya. The null hypothesis is accepted, since the *p*-value of 0.385 is greater than the 1%, 5% and 10% significant levels. Thus, the absence of a diverse board has a significant effect on EAR in South African quoted firms.

The nexus between board size and EAR is our third hypothesis which states that board size has no significant impact on EAR in African quoted firms. From Table 3 it can be inferred that board size has both positive and negative relationship with EAR, as reported in the coefficient values of Egypt (0.3737) and South Africa (0.0164) and Kenya (−0.0033) and Nigeria (−0.0205), respectively. The implication is that 1% and 5% increase in board size will lead to 1% and 2% increase in EAR in South Africa and Nigeria, respectively. Based on the *p*-values of 0.000 and 0.024 for South Africa and Nigeria, which are less than the significant levels of 0.01 and 0.05 for the two countries, we reject the null hypothesis and conclude that board size has a significant impact on EAR in South Africa and Nigeria and accept the null hypothesis that board size has no significant impact on EAR in Egypt and Kenya, since the p-values are greater than 0.01, 0.05 and 0.1 significant levels. Based on the social contract theory, it can be inferred that a large board size will represent the interest of different stakeholders, especially in ensuring that businesses are conducted within tenets of their existence in the society. The findings of this study for South Africa and Nigeria are consistent with

the findings of Odia (2014), Trireksani and Djajadikerta (2016), Coffie et al. (2017), Anazonwu et al. (2018) and Shabab and Ye (2018), while the findings of Egypt and Kenya study agree with the empirical findings of Cheng and Courtenay (2006), Uwuigbe et al. (2011), Oba and Fodio (2012) and Alnabsha et al. (2018).

The fourth hypothesis relates to NEDs and their influence on EAR in African quoted firms. A negative relationship exists between the proportion of NEDs on the board and EAR in Egypt, while a positive relationship is present in Kenya and South Africa. The variable for Nigeria was dropped to help solve the multicollinearity problem that was identified. This shows that as board independence (NED) increases on the board by 1%, there will be 130% decrease in EAR in Egypt, while an increase in NEDs on the board by 1% leads to 12% and 5% increase in EAR for Kenya and South African companies. The *p*-values of 0.067 and 0.077 imply that at a 10% degree of freedom, the values are statistically significant, since the calculated *p*-values are lesser than the significant level. Thus, the null hypothesis is rejected for Egyptian and Kenyan companies, and we conclude that NEDs have a significant impact on EAR. Based on stakeholders' theory, NEDs on the board will substantially affect decisions that will improve EAR. The findings from this study agree with the previous studies of Ionel-Alin et al. (2012), Odia (2014), Anazonwu et al. (2018) and Hussain et al. (2018).

Furthermore, at 10% degree of freedom for South Africa, the null hypothesis is accepted because the *p*-value of 0.551 is greater than the critical value of 0.1 and, thus, the conclusion that there is no significant positive relationship between NEDs and EAR. The empirical result of our study reflects the findings of the previous studies of Cheng and Courtenay (2006), Coffie et al. (2017) and Alnabsha et al. (2018).

The last hypothesis stated that EAR is not influenced by institutional ownership in African quoted firms. The results present a positive relationship between institutional ownership and EAR in Nigeria with a coefficient value of 0.0019 and a negative relationship between the variables in Egypt, Kenya and South Africa with –0.0049, –0.0007 and –0.0007, respectively. This implies that for 1% increase in institutional ownership, there is a 0.19% increase in EAR in Nigeria quoted firms, while in Egypt, Kenya and South Africa, for every 1% increase in institutional ownership, there is a 0.4%, 0.07% and 0.07% decrease in EAR, respectively. The *p*-values of 0.002, 0.046 and 0.089 are less than the significant level of 1%, 5% and 10%; thus, the null hypothesis is rejected for Nigeria, Egypt and South Africa. Therefore, we conclude that EAR is influenced by institutional ownership in Nigeria, Egypt and South Africa. Institutional investors are groups that can substantially affect the welfare of the firm, as buttressed by the stakeholders' theory; thus, their presence in organizations cannot be overlooked. This study result is in agreement with the previous studies of Rao et al. (2012) and Shabab et al. (2018). Conversely, the *p*-value of 0.167 (Kenya) is greater than the significant level of 10%; thus, the null hypothesis is accepted. This implies that there is no significant relationship between institutional ownership and EAR in Kenya. The findings of Odia (2014) and Garcia-Meca and Pucheta-Martinez (2017) validate this result.

Conclusion

The study examined corporate governance mechanisms and EAR in four African countries with a representation each from the north, south, east and west of the continent. Using data across six different sectors in the selected quoted companies in the countries studied with content analysis conducted, the study concludes that corporate governance variables such as board committee,

board diversity, board size, NEDs and institutional ownership influence EAR in the African countries studied.

Implications/Future Research

In line with the findings of the study, it is, therefore, recommended that policymakers like the Stock Exchange and Securities Commission should ensure that board committees, especially on environmental and social responsibility matters, should be encouraged and emphasized more in Africa quoted companies, especially in Kenya and Nigeria where the percentage of board committee is low compared to Egypt and South Africa, as they play a key and vital role in EAR. It is also important that emphasis be placed by South African companies on a diverse board, since in Kenya and Nigeria, their presence has a significant impact on EAR. A well-diverse board encourages shared knowledge, experience and skills among members.

Similarly, policymakers in South Africa and Egypt where board size is relatively low on the average are advised to increase their board size to boost and enhance corporate accountability and reporting, especially on environmental issues. Finally, regulators of quoted companies must ensure strict adherence to the provisions of the code of corporate governance on the number of non-executive/independent directors on the board. In South Africa particularly, there is the need to be specific on the required number of NEDs on the board of corporations. The presence of institutional ownership should be encouraged in Kenya, as their involvement in decision making will affect EAR positively, as seen in Nigeria, Egypt and South Africa.

The study recommends that future research direction could be geared towards a comparative study of more African companies and/or Asian companies that are in developing economies, given the possible limitations associated with purposive selection of companies across the north, south, east and west of the African continent. Similarly, it should be noted that there might be other corporate governance variables, which affect EAR, other than the ones used in this study, given that countries in Africa operate in an emerging market.

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