Board characteristic and corporate environmental reporting in Nigeria

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Abstract

Purpose – The issue that revolves around corporate governance and corporate environmental reporting (CER) has always been an essential element deliberated upon globally. A good corporate governance mechanism instills an investor's confidence and ensures a transparent process that facilitates more disclosures and quality reporting. Precisely, the purpose of this paper is to investigate the relationship between corporate governance variables, namely, board size, board independence, board meeting (BM), risk management committee composition and CER in Nigeria. This study utilized the data obtained from the annual reports of 24 non-financial public listed companies in the Nigeria Stock Exchange comprising three sectors, namely, industrial goods, natural resources and oil & gas for the period of 2011–2015. The model of this study is theoretically based on agency theory. In analyzing data, this study utilized panel data analysis. Based on the Hausman test, the random effect model was used to examine the effect of predictors on CER. The result indicates a positive significant relationship between board independence and CER. Similarly, a positive significant relationship between BM and CER is revealed in the study. However, there is no significant relationship between other hypothesis variables and CER. Finally, the study provides suggestions for future research and several recommendations for regulators, government and accounting professional bodies.
Design/methodology/approach – The data was analysed using statistics.
Findings – The result indicates a positive significant relationship between board independence and CER. Similarly, a positive significant relationship between BM and CER is revealed in the study. However, there is no significant relationship between other hypothesis variables and CER.
Originality/value – There are no prior studies linking risk management committee with CER.

Keywords Corporate governance, Board of Directors, Corporate environmental reporting, Risk management committee

Paper type Research paper

Introduction

Historically, the primary aim of traditional corporate reporting is to communicate economic information and measurements about the resources and performance of the company's financial and non-financial indicators for informed decision making (ASSC, 1975). There are basically two types of corporate reporting, namely, mandatory and voluntary. While mandatory disclosure refers to the disclosure required by laws from regulatory organizations or accounting standards, the voluntary disclosure refers to the information that the company willingly chooses to disclose for different reasons.

In recent years, economic growth and development are perceived to have an adverse effect on the environment, thus it has become a matter of public concern both locally and internationally. The corporate world is increasingly being pressurized to provide more information about the effect of their operation activities on the environment (Uwalomwa, 2011). Thus, corporate environmental reporting (CER) has become an important topic of national and international discourse.

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The public demand for more CER has greatly improved, as stakeholders have become more conscious. Pramanik *et al.* (2008) perceived CER as a "universal issue" with a persistent demand for harmonization of environmental costs and liabilities of accounting reporting.

The corporate environmental report is established to provide environmental information, such as corporate activities in protecting and preserving the natural environment (Shearer, 2002). This report shows the organizations stride toward the environment and strategists adapted to source for alternative measures that are less harmful to the environment. The companies are expected to voluntarily establish a report of their non-financial activities that improved the well-being of human, community, workplace, market and environment.

However, Rouf (2011) argues that CER more at times does not serve the need of external users because top management of the organization are more likely to pursue their personal interests when taken managerial decisions, and the resultant effect is more disclosure gap such as the variance between actual and expected disclosure.

The choice to disclose or not to disclose more information largely depends on several factors like corporate and board characteristics (Sheila *et al.*, 2012). Therefore, the code on corporate governance 2011 was introduced in Nigeria to facilitate quality information presented by corporate entities in Nigeria.

Universally, committee of nations, supranational organization and government have also established their concern over the environment through initiating policies and rules, such as the International Financial Reporting Standard Board (IFRSB), Global Reporting Initiative (GRI)and the Association of Chartered Certified Accountants (ACCA).

For instance, the IFRSB has introduced Financial Reporting Standard (FRS) 101 – Presentation of Financial Statements which require firms to declare their environmental information on human activities that could have an effect on the environment. Conversely, GRI is an organization established not to make a profit but to promote social, economic, environmental and sustainability through developing a framework of sustainability reporting that is widely used globally for all types of businesses, large or small.

It has launched its latest framework in 2013 which is called the G4. This newly improved framework includes a harmonization with other vital global frameworks, including the Organization for Economic Cooperation and Development Guidelines for Multinational Companies, the United Nation Global Compact Principles and the United Nations Guiding Principles of Business and Human Rights.

Previously, there were several studies on CER practices in public listed companies globally with a limited number of studies conducted in Africa, especially in Nigeria. Most of the studies found that CER was done on a voluntary basis (see Ku-Ismail and Ibrahim, 2009; Joshi *et al.*, 2011; Suttipun and Stanton, 2012).

CER among companies has increased such that studies have encouraged future prospect for mandatory disclosure of environmental information (Galani *et al.*, 2011; Suttipun and Stanton, 2012). Recently, some countries for instance China, Denmark, The Netherlands and Norway have made CER as one of the compulsory disclosures in the company's annual reports.

Environmental reporting issues are considered a vital component of corporate governance. This is in accordance with the new provision of code on corporate governance best practices. To the best of the researcher's knowledge, there is no comprehensive prior study conducted in Nigeria in the context of examining risk management committee attributes relationship with CER in the three environmentally sensitive industries (Industrial goods, natural resources and Oil & gas).

Therefore, there is a need to have convergence between CER and corporate governance to ensure more environmental reporting disclosures. Irrespective of the importance of corporate governance and its possible impact on organizations to disclose more CER, there are limited studies conducted in this area (Buniamin *et al.*, 2008). Therefore, the study intends to ascertain whether there is any relationship between the board of directors, risk management committee and CER.

Research questions

This study seeks to find answers to the following research questions:

RQ1. Does board size (BS) influence CER in Nigeria?

RQ2. Does board independence influence CER in Nigeria?

RQ3. Does board meeting (BM) influence CER in Nigeria?

RQ4. Does risk management committee composition influence CER in Nigeria?

Research objectives

The research objectives of this study are as follows:

(1) to examine the BS influence on CER in Nigeria;

(2) to examine the board independence influence on CER in Nigeria;

(3) to examine the BM influence on CER in Nigeria; and

(4) to examine the risk management committee composition influence on CER in Nigeria.

To achieve the research objectives, four board characteristics, namely, BS, board independence, BM and risk management committee composition were chosen.

Theoretical framework

According to Deegan (2002), there is a need to explore into different theoretical perspective to understand the CER and disclosures. Different theories are complementary rather than competing to support the hypotheses (Carpenter and Feroz, 2001). Therefore, this study used agency theory to support the development of hypotheses. Agency theory posits that where there is a separation of ownership and control of a company, agency cost exists. This is due to the conflicts of interest between principal and agent (Jensen and Meclcling, 1976). According to Jensen and Meclcling (1976), agency costs that are being borne by managers may motivate them to voluntarily disclose corporate environmental information to reduce agency costs. Larger information asymmetry would also exist between managers and shareholders if managers do not reveal more information that would benefit the stakeholders (Gantyowati and Nugraheni, 2014).

The objective of the agency theory is to reduce "agency cost" by establishing internal controls systems. This is done in two ways: by forming a financial incentive scheme that aims at aligning principal's and agent's interests and governance structure where the board of directors perform audits; and performance evaluations on the managers (Alange and Steiber, 2009). From the corporate governance view, adequate monitoring mechanisms need to be established to protect shareholders from management's conflict of interests which is called "agency cost" (Fama and Jensen, 1983). According to Peter and Romi (2015) agency theory also suggests that the board's membership should be independent to better monitor management when disclosing sustainability information especially on the environment.

Determinant variables

This study examines board characteristics and CER disclosures. The determinant variables include four board characteristics which are: BS, board independence, BM and risk management committee composition. The study used two control variables: profitability and company size.

Based on past literature, the study developed a research framework on board of directors, risk management committee and CER using the board characteristics as presented in Figure 1.

Hypothesis development
Referring to the selected hypotheses variables in the latter section, the study develops four hypotheses to support the research objectives. The detail of each hypothesis is explained in the subsequent section.

Board size
According to Florackis (2008), the board of directors with more than seven or eight members is unlikely to be effective. This is because a larger number of people would tend to disrupt the effectiveness of communication, coordination and decision making. Thus, the end decision would be controlled by top management. However, it is not in tandem with recent studies (Janggu *et al.*, 2014; Zubaidah *et al.*, 2009; Buniamin *et al.*, 2011).

Janggu *et al.* (2014) found a positive relationship between BS and sustainability reporting. Similarly, a study by Buniamin *et al.* (2011) found that BS has a positive significant influence on CER disclosure.

It is argued that BS would have a significant influence on CER. This is due to the findings of Buniamin *et al.* (2011) and Janggu *et al.* (2014) as to the influence of BS on environmental reporting, this study hypothesizes that there is a positive significant relationship between BS and the existence of environmental reporting:

H1. Companies with more board members are more likely to have a positive influence on environmental reporting disclosures.

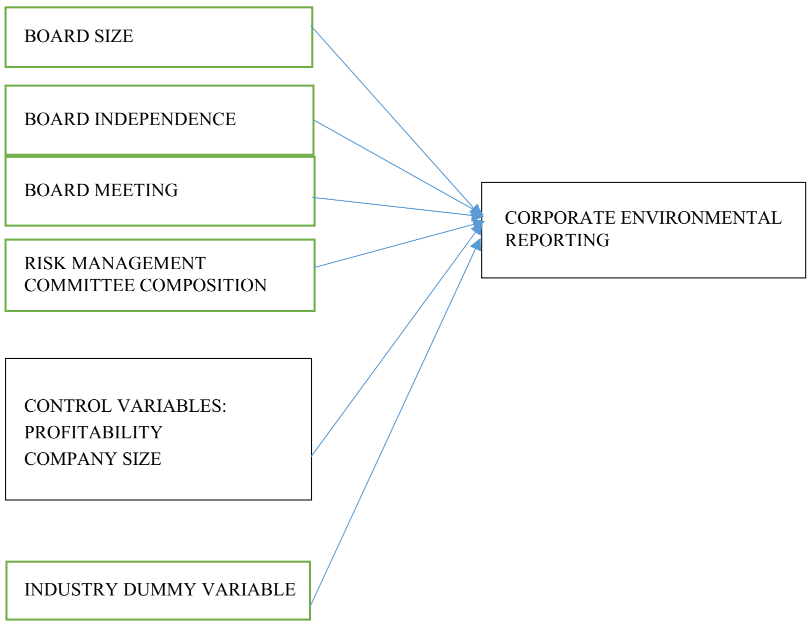

Figure 1.
Research framework

Board independence

The quality of personalities who serve on the board is a pointer for effective monitoring. Board independence is perceived to be more efficient if it has more members of independent non-executive directors, they have the incentive to develop their reputation as experts (Fama and Jensen, 1983). The oversight functions performed by such members adhere more to the related approved standards, laws and regulations. This is in tandem with the agency theory view where independent board members would be able to monitor any self-interested actions by managers and lower agency cost (Peter and Romi, 2015).

Several studies (see Htay *et al.*, 2012 and Salehuddin and Fadzil, 2013) found that the board of directors' independence is very important in the determining the level of CER disclosures. Thus, it is argued that independent directors would influence other directors to voluntary disclose more information about the company to the stakeholders. As such, this study hypothesized that there is a positive relationship between board independence and the existence of environmental reporting disclosure:

H2. Companies with more independent board members are more likely to have a positive influence on CER.

Board meeting

BM is one of the initiatives by the board to perform its oversight function on the management (agent); this is in tandem with the agency theory in which the board members act as the principal. BM serves as a platform to share knowledge and information among experts. This is a crucial and critical resource for the organization.

Prior studies suggest that frequency of the BMs is credited to the number of meetings held annually by the board of directors. As indicated by Chen *et al.* (2006) BM recurrence reflects sound checking systems. Thus, implies that board practices if carried out by the recurrence of meetings influence the capacity of the board to scrutinize reports to reduce agency problems and improve more quality disclosures (Xie *et al.*, 2003; Knechel *et al.*, 2007). Increase scrutiny and monitoring by board decrease agency cost and information asymmetry and invariably improve quality disclosures (Chou *et al.*, 2013). According to Conger *et al.* (1998) BM has a significant relationship with CER disclosures. Thus, frequent BMs would improve the quality of corporate disclosures:

H3. There is a positive relationship between the frequency of BM and CER.

Risk management committee composition

Section (10) of the Code on Corporate Governance 2011 in Nigeria provides that the board may establish risk management committee to assist the board in its oversight of risk profile, risk management and risk-reward strategy for the organization. It is a voluntary recommendation not binding on the companies. Risk is a concept used to describe future uncertainty.

Risk management has now become an integral part of corporate governance and is a link to the internal control systems. This awareness has resulted to improve board oversight functions which in turn can enhance the board governance structure, quality reporting disclosures and drastically reduce the scope of the audit committee work (Yatim, 2010).

De Lacy recommended for a separation between the audit committee and risk management committee especially for complex business industries. The complexities associated with the industries expose them to failure (Jarvis, 2005). The quality of individuals who are members of the risk management committee is an important indicator of the effective monitoring of risk matters. The risk management committee seems to be more efficient when there is quite a number of independent non-executive directors (Fama and Jensen, 1983).

Successful companies frequently exhibit a reliable emphasis on risk management. One way to successful risk management is no doubt including the majority of non-executive directors to be part of the committee. Prevention action is the best cure, and non-executive directors perceive and acknowledge how management is taking care of risks (Barde, 2009).

The non-executive directors' risk management is essentially a problem of acting expressly ahead of time to keep a risk occasion from happening or to reduce its results when it does. The shareholders' wealth increase if non-executive directors establish a good risk management system and effective business decisions. Methodology and business choices convey risk and a risk-reward system. The outside directors' role in risk management issues is reflected in the guidelines and rules in numerous districts (Hassan, 2007):

H4. There is a positive relationship between risk management committee composition and CER.

Model of the study

To answer the objective of the study:

$$\mathrm{CER}_{it} = \beta_0 + \beta_1 \mathrm{BS}_{it} + \beta_2 \mathrm{BI}_{it} + \beta_3 \mathrm{BM}_{it} + \beta_4 \mathrm{RC}_{it} + \beta_5 \mathrm{ROA}_{it} + \beta_6 \mathrm{TA}_{it} + \beta_7 \mathrm{D}_{it} + \varepsilon_{it}, \quad (1)$$

where β_0 is constant for all entities over the period, $\mathrm{CER}_{it} =$ environmental reporting index score for the period, $\mathrm{BS}_{it} =$ total number of the board members, $\mathrm{BI}_{it} =$ the proportion of independent non-executive directors on board, $\mathrm{BM}_{it} =$ frequency of BM held in the company financial year, $\mathrm{RC}_{it} =$ the proportion of the independent non-executive directors on the risk management committee, $\mathrm{ROA}_{it} =$ net income divided by total asset for the period, $\mathrm{TA(log)}_{it} =$ log of total Asset for the period, $D_{it} =$ industrial dummy variable coded 1 to oil & gas companies and 0 for others, $\varepsilon_{it} =$ error term for all companies over the period (Tables I and II).

Disclosure score for the environmental reporting index:

(1) Score description of table format.

S. No.	Number of environmental reporting index
1	Any mention of promoting sustainability
2	Company's statement of corporate commitment to environmental protection
3	Environmental policy formulation
4	Environmental management system (IS0 14001)
5	Efficiency of energy and water consumption
6	Trees planting or replanting programs and initiatives
7	Protection and preservation of a natural environment in areas of high biodiversity
8	Sustainable waste management
9	Reduce greenhouse gas emissions
10	Incorporate pollution prevention practices (e.g. reduce, recycle and reuse)
11	Green safe products and services
12	Use of environmental alternative technology in managing business production
13	Fines/lawsuits/noncompliance incidents related to the environment
14	Compliance to any laws and regulations related to the environment
15	Corporate fleet to use an eco-friendly vehicle
16	Networking with "green" stakeholder groups
17	Environmental budgets expenditures
18	Environmental education for employees and community
19	Environmental awards/achievements

Sources: Adapted from: Wiseman (1982) on the bases of Global reporting initiative (GRI: G4) (2013). Modified by Cormier and Gordon (2001), Yusoff and Darus (2014) and Sulaiman *et al.* (2014)

Table I. Environmental reporting index (GRI)

Variables	Measurement	Hypothesis	Prediction
Board size	Number of board of Directors (e.g. Buniamin, 2010)	*H1*	Positive
Board independence	Number of non-executive directors divided by total Number of directors on Board (%) (Buniamin, 2010)	*H2*	Positive
Board meetings	Number of board meetings held annually (Conger *et al.*, 1998)	*H3*	Positive
Risk management committee composition	RMC composition considers the extent of non-executives' directors on the board, measured in this study as a dichotomous variable given one (1) if there exist at least one non-executive on risk management committee otherwise zero (0) (see, Michelon and Parbonetti, 2010; Kurawa and Kabara, 2014).	*H4*	Positive
Profitability	ROA (Naira) (e.g. Smith *et al.*, 2007; Ong *et al.*, 2014; Sulaiman *et al.*, 2014)	–	Positive
Company size	Log of total asset (see, Buniamin, 2010; Buniamin *et al.*, 2011; Joshi *et al.*, 2011; Salehuddin and Fadzil, 2013; Sulaiman *et al.*, 2014)	–	Positive
Industrial dummy variable	1 is coded to oil & gas companies and 0 is coded to other companies	–	–

Table II.
Summary of measurements

(2) 0 items that are not disclosed.

(3) 1 items that are disclosed in qualitative.

(4) 1 items that are disclosed in diagram or picture.

(5) 2 items that are disclosed in quantitative or financial.

Source: Adapted from Sulaiman *et al.* (2014)

Linear regression analysis

In the current study, the analysis of linear regression is being utilized as a statistical technique to investigate the relationships that arise amongst the dependent variable and four independent variables comprising BS, board independence, BM, risk management committee composition and the two control variables which are profitability and total asset for 24 listed firms in Nigerian oil & gas, natural resources and industrial goods. Table III reveals the analysis of result for random effects model in the study.

Variables	Coef.	SE	*z*
BS	0.0115358	0.137154	0.84
BI	0.3530959	0.1510829	2.34**
BM	0.035602	0.0203326	1.75**
RC	0.0002878	0.0785901	0.00
ROA	0.0010162	0.0014494	0.70
TA	0.0712573	0.036754	1.94**
D	−0.0528609	0.0731596	−0.72
_cons	−0.4864737	0.2726068	−1.78

Notes: CERS, environmental reporting index; BS, total number of the board members; BI, the proportion of independent non-executive directors on board; BM, frequency of board meeting held in the company financial year; RC, the proportion of the independent non-executive directors on the risk management committee; ROA, net income divided by total asset to for every entities; TA (log), log of total Asset for the period; D, industrial dummy variable coded 1 for oil & gas companies and 0 for others. Number of obs $=$ 120; number of group $=$ 24; R^2 within $=$ 0.5117; Wald $\chi^2 = 21.96$; Prob $> \chi^2 = 0.0026$. **0.05 level of sig.

Table III.
Regression result of the model random effect (dependent $=$ CER)

Discussions

As shown by the outcomes in Table III, the rate of R^2 in the model is 0.5117. This implies that the model describes 51.17 percent of the difference in CER and is considered as an acceptable outcome.

In an additional finding, the outcomes, Table III displays the three variables in the study that are discovered to be significant with CER predictors (as being measured by CERS). The variables are board independence (BI) ($\beta = 0.3530959$, $p < 0.05$), BM ($\beta = 0.035602$, $p < 0.05$) and finally total asset (TA) ($\beta = 0.0712573$, $p < 0.1$).

Nevertheless, other variables such as BS ($\beta = 0.0115358$, $p > 0.1$) risk management committee composition (RC) ($\beta = 0.0002878$, $p > 0.1$) and profitability (ROA) ($\beta = 0.0010162$, $p > 0.1$) failed to make a significant contribution as CER predictor (CER as being measured using ERI); thus, the significance values higher than 0.1 were revealed to be statistically insignificantly related to CERS.

This suggests that board independence does influence CER based on both normal and additional analyses done on this studies. Another relationship was found between risk management committee composition and the CER (CER) which found that the variable relationship is statistically negatively insignificant as evidence by the p-value of 0.528 (52.8 percent). This suggests that risk management committee composition does not influence CER on companies in the oil & gas, natural resources and industrial goods sectors.

Table III shows that the BS on this regression has a clear positive effect on CER, and the outcome is insignificant. This finding did not support the first *H1* that there is a positive significant relationship between board size and CER.

As such, the first hypothesis that mentioned there is a positive significant relationship between the board size and CER is not supported. This result shows that an increase in board size would not increase CER. This outcome is like that found in previous studies that board size has no significant association with environmental disclosures (e.g. Wan Abdullah *et al.*, 2012; Abdul Razak and Mustapha, 2013). This insignificant relationship agrees with most studies that find smaller board size can effectively perform better in CER (Zubaidah *et al.*, 2009).

In addition, the study found a positive significant relationship between the board independent and CER. The findings accept *H2* which states that there is a positive significant relationship between the board independence and CER. Therefore, *H2* which reveals that there is a positive significant relationship between the board independence and CER is supported. The result discloses that if there is an increase in the number of independent non-executive directors on board, board size, more CER is reported and vice versa.

This result is like that found in several studies (e.g. Htay *et al.*, 2012; Salehuddin and Fadzil, 2013) that board of directors' independence is very important in the determining the level of CER disclosures. Thus, it is argued that independent directors would influence other directors to voluntary disclose more information about the company to the stakeholders.

For BM variable, this variable has a positive significant relationship on CER. The findings support *H3* which revealed that there is a positive significant relationship between the BM and CER. The positive value indicates that when there is an increase in the number of BMs held, more CER is reported and reverse is the case. The outcome is in tandem with previous studies (see Xie *et al.*, 2003; Knechel *et al.*, 2007). Thus, it implies that board practices if carried out by recurrence of meetings influence the capacity of the board to scrutinize reports to reduce agency problems and improve more quality disclosures.

Furthermore, the findings which revealed the relationship between risk management committee compositions and CER are insignificant. The findings failed to support *H4* which revealed that there is a positive significant relationship between the risk management committee composition and CER. The positive value indicates that when there is a decrease in the number of independent non-executive directors, more CER are reported and reverse is the case. The outcome is not in tandem with a previous study (Yatim, 2010) that a well-established risk management committee improves board oversight functions which in turn can enhance the board governance structure, quality reporting disclosures and drastically reduce the scope of the audit committee work.

Also, the study adopted two control variables which are profitability and company size. The use of profitability as a control variable is being justified by the findings of companies with various distinct characteristics. Profitability usually would be referred to as one of the indicators to measure a company's performance. Prior studies would use profitability as their control variables to examine the relationship between financial attributes against CER (Lang and Lundolhm, 1993; Alarussi, 2009; Suttipun and Stanton, 2012). Mix results were found on profitability.

Lang and Lundolhm (1993) view companies with less profit would provide more disclosure on environmental information. Companies might use the condition of having lesser profit as a mechanism of defense toward its stakeholders that less profit means more expenses were made especially for the CER. The result in Table III shows a positive relationship, but statistically insignificant ($\beta = 0.0010162$, $p < 0.1$) between profitability (ROA) and CER. This was consistent with the study by Makori as mentioned earlier.

The second control variable considered was the company size. Previous studies found a positive relationship between company size and environmental disclosure such as Deegan and Gordon (1996) and Joshi *et al.* (2011). While size is known for being a representative for company visibility, it also represents the company capability in a financial manner to have social responsibility and environmental activities (Joshi *et al.*, 2011). A recent study by Barbu *et al.* (2014) examines the mandatory reporting of environmental information in compliance with IASAFRS on three potential countries which are Germany, France and the UK. They found that company size is a relevant proxy for the influential factor against CER on a mandatory basis.

Romlah *et al.* (2002) and Cornier and Magnan found that large firms lean toward more disclosure of information voluntarily. Sharifah posits that a company that is visible in public has a better possibility to disclose more information to enhance its legitimacy and corporate image. Big companies are more expected to be worried about their corporate environmental performance since they are more visible to external interested parties who always demand for an improved environmental disclosure (Uwalomwa, 2011). As illustrated in Table III, the result displays a positively significant relationship between the company size (TA) and CER ($\beta = 0.0712573$, $p < 0.1$). This result is consistent with the ones found in previous studies (Table IV).

Hypothesis	Hypothesis statement	Findings
H1	Companies with more board members are more likely to have a positive significant influence on environmental reporting disclosures	Positive and insignificant
H2	Companies with more independent board members are more likely to have a positive significant influence on CER	Positive and significant
H3	There is a positive significant relationship between frequency of board meetings and CER	Positive and significant
H4	There is a positive significant relationship between RMC composition and corporate environmental reporting	Positive and insignificant

Table IV.
Summary of hypothesis testing result

Implications of the study

This research examined the relationship between corporate governance mechanisms (board size, board independence, BM and risk management committee composition) and CER in Nigeria. The findings of the study would provide invaluable insight to the government, stock market, audit firms, accounting regulators and professional bodies, as to the extent which codes on corporate governance rules and resolutions are implemented by non-financial listed companies especially oil & gas, natural resources and industrial goods sectors. Furthermore, the study provides invaluable information to the government and regulators when making new policies or deliberating on issues regarding corporate governance in relation to CER in Nigeria.

Moreover, the importance of having a good corporate governance practice should be emphasized to achieve credibility and quality disclosures. Hence, the result of the study could improve corporate governance practices by management, and corporate environmental disclosures and reporting in organizations most especially in the oil & gas, natural resources and industrial goods sectors. Finally, the result of this study expedites the need for integrating environmental issues to the investment decision of shareholders.

Limitations of the study

There are very few studies conducted on corporate governance mechanisms (board size, board independence, BM and risk management committee composition) and CER in Nigeria. However, due to the differences in environment and culture between these countries and Nigeria, the results of these studies might not be too suitable to apply in the Nigerian setting. The outcome of the study might not be applicable to all listed companies due to the focus of the research on listed companies perceive to be environmentally sensitive such as the oil & gas, natural resources and industrial goods sectors.

Recommendations for future studies

The limitations of this study have urged the following recommendations for future research:

(1) To enhance the model of this study, future research ought to incorporate other corporate governance variables like risk management committee diligence and knowledge, audit committee size and accounting background, and management ownership. Furthermore, the data for this research cover only listed companies in three sectors (oil & gas, natural resources and industrial goods). Further studies can consider all non-financial listed companies on the Nigerian stock exchange market.

(2) The data utilized for the study are originated from 24 non-financial listed companies in Nigeria with the level of their environmental disclosures. A large data set relating financial and non-financial organizations might convey a substitute model of the relationship that exists between the CER and corporate governance. The introduction of new corporate governance mechanisms might also convey extra edge-worth mixtures of the internal control mechanism.

(3) This research has added impetus to explore corporate governance with CER in a broader context. Further research could explore the relationship in more specific categories, for example, in nonprofit making organizations, government-owned companies and in family business. Since this study focused on three sectors. It would be beneficial to have a clearer understanding of corporate governance roles in other types of organizations. Such research could address the similarities and differences of the roles in different organizations and also consider the legal requirements for different organizations.

(4) Advance studies are also essential on the behavioral features of the boards. Studies in developed countries have recently started examining board processes by attending actual BMs. However, this also needs to be expanded by studies in

developing economies. There is therefore the need to go beyond the quantitative research, which yields a mixture of results, to perhaps a more qualitative approach as to how boards work. Expanding this current research into a wider study of board dynamics and decision making would be a start in developing a better understanding of corporate governance.

(5) Future study could also explore the perception of stakeholders on corporate social reporting, as it is evidenced that there is no standard template in Nigeria that serves as a guide for the preparation of corporate social reporting. The study could have harmonized views of stakeholders on what are their expectations and areas they felt is below standard benchmark peculiar to Nigerian setting.

Conclusions

The study examines the relationship between some corporate governance variables (board size, board independence, BM and risk management committee composition) and CER has been accomplished. Based on the outcome of the panel data analysis, two variables namely board independence and BM are found to have a positive significant relationship with the CER and the other hypothesis variables are insignificant.

References

Abdul Razak, S.E. and Mustapha, M. (2013), "Corporate social responsibility and board structure: evidence from Malaysia", *Journal Technology*, Vol. 64 No. 3, pp. 73-80.

Alange, S. and Steiber, A. (2009), "The board's role in sustaining major organizational change: an empirical analysis of three change programs", *International Journal of Quality and Service Sciences*, Vol. 1 No. 3, pp. 280-293.

Alarussi, A.H. (2009), "Internet financial and environmental disclosures by Malaysian companies", *Issues in Social and Environmental Accounting*, Vol. 3 No. 1, pp. 3-25.

ASSC (1975), *The Corporate Report*, Accounting Standards Steering Committee, London.

Barbu, E.M., Dumontier, P., Feleaga, N. and Feleagk, L. (2014), "Mandatory environmental disclosures by companies complying with IASs/IFRSs: the cases of France, Germany, and the UK", *The International Journal of Accounting*, Vol. 49 No. 2, pp. 231-247.

Barde, M.I. (2009), "An evaluation of accounting information disclosure in the oil and gas marketing industry", PhD thesis, Bayero University, Kano.

Buniamin, S. (2010), "The quantity and quality of environmental reporting in annual report of public listed companies in Malaysia", *Issues in Social & Environmental Accounting*, Vol. 4 No. 2, pp. 115-135.

Buniamin, S., Alrazi, B., Johari, N.H. and Abd Rahman, N.R. (2008), "An investigation of the association between corporate governance and environmental reporting in Malaysia", *Asian Journal of Business and Accounting*, Vol. 1 No. 2, pp. 65-88.

Buniamin, S., Alrazi, B., Johari, N.H. and Abd Rahman, N.R (2011), "Corporate governance practices and environmental reporting of companies in Malaysia: finding possibilities of double thumbs up", *Journal Pengurusan*, Vol. 32 No. 2011, pp. 55-71.

Carpenter, V.L. and Feroz, E.H. (2001), "Institutional theory and accounting rule choice: an analysis of four US state governments' decisions to adopt generally accepted accounting principles", *Accounting, Organizations and Society*, Vol. 26 No. 7, pp. 565-596.

Chen, G., Firth, M., Gao, D.N. and Rui, O.M. (2006), "Ownership structure, corporate governance, and fraud: evidence from China", *Journal of Corporate Finance*, Vol. 12 No. 3, pp. 424-448, doi: 10.1016/j.jcorpfin.2005.09.002.

Chou, H.I., Chung, H. and Yin, X. (2013), "Attendance of board meetings and company performance: evidence from Taiwan", *Journal of Banking & Finance*, Vol. 37 No. 11, pp. 4157-4171.

Conger, J.A., Finegold, D. and Lawler, E.E. (1998), "Appraising boardroom performance", *Harvard Business Review*, Vol. 76, pp. 136-148.

Cormier, D. and Gordon, I.M. (2001), "An examination of social and environmental reporting strategies", *Accounting, Auditing & Accountability Journal*, Vol. 14 No. 5, pp. 587-617.

Deegan, C. (2002), "Introduction to the legitimizing effect of social and environmental disclosure: a theoretical foundation", *Accounting, Auditing and Accountability Journal*, Vol. 15 No. 3, pp. 282-311.

Deegan, C. and Gordon, B. (1996), "A study of the environmental disclosures practices of Australian corporations", *Accounting and Business Research*, Vol. 26 No. 3, pp. 187-199.

Fama, E.F. and Jensen, M.C. (1983), "Separation of ownership and control", *Journal of Law and Economics*, Vol. 26 No. 2, pp. 301-325.

Florackis, C. (2008), "Agency costs and corporate governance mechanisms: evidence for UK firms", *International Journal of Manageria1 Finance*, Vol. 4 No. 1, pp. 37-59.

Galani, D., Gravas, E. and Stavropoulos, A. (2011), "The relation between firm size and environmental disclosure", *International Conference on Applied Economics*, pp. 179-186.

Gantyowati, E. and Nugraheni, R.L. (2014), "The impact of financial distress status and corporate governance structures on the level of voluntary disclosures within annual report of firms (case study of non-financial firms in Indonesia over the period of 2009 - 2011)", *Journal of Modern Accounting and Auditing*, Vol. 10 No. 4, pp. 389-403.

Hassan, A. (2007), "Determinants of corporate social performance, disclosure in the Nigerian foods and beverages Industry", MSc dissertation, Bayero University, Kano.

Htay, S.N.N., Ab. Rashid, H.M., Adnan, M.A. and Meera, A.K.M. (2012), "Impact of corporate governance on social and environmental information disclosure of Malaysian listed banks: Panel data analysis", *Asian Journal of Finance Accounting*, Vol. 4 No. 1, pp. 1-24.

Janggu, T., Darus, F., Mohamed Zain, M. and Sawani, Y. (2014), "Does good corporate governance lead to better sustainability reporting? An analysis using structural equation modeling", *Procedia - Social & Behavioral Sciences*, Vol. 145, pp. 138-145.

Jarvis, L. (2005), "Risk aversion hits biotech market", *Chemical Market Reporter*, Vol. 268 No. 2, pp. 34-35.

Jensen, M.C. and Meclcling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Joshi, P.L., Suwaidan, M.S. and Kumar, R. (2011), "Determinants of environmental disclosures by Indian industrial listed companies: empirical study", *International Journal of Accounting and Finance*, Vol. 3 No. 2, pp. 109-130.

Knechel, W.R., Salterio, S. and Ballou, B. (2007), *Auditing: Assurance and Risk*, 3rd ed., South-Western College Publishing, Cincinnati, OH.

Ku-Ismail, K.N.I. and Ibrahim, A.H. (2009), "Social and environmental disclosure in the annual reports of Jordanian companies", *Issues in Social and Environmental Accounting*, Vol. 2 No. 2, pp. 198-210.

Kurawa, J.M. and Kabara, A.S. (2014), "Effect of corporate governance on voluntary disclosure by firms in the downstream sector of the Nigerian petroleum industry", *Proceedings of World Business Research Conference*, *April 21–23*.

Lang, M. and Lundolhm, R. (1993), "Cross-sectional determinants of analyst ratings of corporate disclosures", *Journal of Accounting Research*, Vol. 3 1 No. 2, pp. 246-271.

Michelon, G. and Parbonetti, A. (2010), "The effect of corporate governance on sustainability disclosure", *Journal of Management Governance*, Vol. 16 No. 3, pp. 477-509.

Ong, T.S., Teh, B.H. and Ang, Y.W. (2014), "The impact of environmental improvements on the financial performance of leading companies listed in Bursa Malaysia", *International Journal of Trade, Economics and Finance*, Vol. 5 No. 5, pp. 386-391.

Peter, G.F. and Romi, A.M. (2015), "The association between sustainability governance characteristics and the assurance of corporate social responsibility", *Auditing: Journal of Practice & Theory*, Vol. 34 No. 1, pp. 163-198.

Pramanik, A.K., Shil, N.C. and Das, B. (2008), "Corporate environmental reporting: an emerging issue in the corporate world", *International Journal of Business and Management*, Vol. 3 No. 12, pp. 146-154.

Romlah, J., Takiah, M. and Nordin, M. (2002), "An investigation on environmental disclosures: evidence from selected industries in Malaysia", *International Journal of Business and Society*, Vol. 3 No. 2, pp. 55-68.

Rouf, A. (2011), "Corporate characteristics, governance attributes and the extent of voluntary disclosure in Bangladesh", *African Journal of Business Management*, Vol. 5 No. 19, pp. 7836-7845.

Salehuddin, M.R. and Fadzil, F.H. (2013), "Factors influencing corporate environmental responsibility disclosures: a case of Shariah-compliant companies listed in the main market of Bursa Malaysia", *Malaysian Management Review*, Vol. 48 No. 1, pp. 1-26.

Shearer, T. (2002), "Ethics and accountabi1ity: from the-for-itself to the for-the-other", *Accounting, Organizations and Society*, Vol. 27 No. 6, pp. 541-573.

Sheila, N.H., Rashid, H.M., Mohammad, A.A. and Meera, A.K. (2012), "Impact of corporate governance on social and environmental information disclosure of Malaysian listed banks: panel data analysis", *Asian Journal of Finance and Accounting*, Vol. 4 No. 1, pp. 1-24.

Smith, M., Yahya, K. and Amiruddin, A.M. (2007), "Environmental disclosure and performance reporting in Malaysia", *Asian Review of Accounting*, Vol. 15 No. 2, pp. 185-199.

Sulaiman, M., Abdullah, N. and Fatima, A.H. (2014), "Determinants of environmental reporting in Malaysia", *International Journal of Economics, Management and Accounting*, Vol. 22 No. 1, pp. 63-90.

Suttipun, M. and Stanton, P. (2012), "Determinants of environmental disclosure in Thai corporate annual reports", *International Journal of Accounting and Financial Reporting*, Vol. 2 No. 1, pp. 99-115.

Uwalomwa, U. (2011), "An empirical investigation of the association between firm's characteristics and corporate social disclosures in the Nigerian financial sector", *Journal of Sustainable Development in Africa*, Vol. 13 No. 1, pp. 60-73.

Wan Abdullah, W.M.T., Buniarnin, S. and Mohd Ghazali, M.H. (2012), "The effect of board and ownership structure on environmental reporting: a case of the top 100 MCG index companies: OIDA International", *Journal of Sustainable Development*, Vol. 4 No. 7, pp. 71-80.

Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Journal of Accounting, organisations and Society*, Vol. 7 No. 1, pp. 53-63.

Xie, B., Davidson, W.N. and Dadalt, P.J. (2003), "Earnings management and corporate governance: the role of the board and the audit committee", *Journal of Corporate Finance*, Vol. 9 No. 3, pp. 295-316, doi: 10.1016/S0929-1199(02)00006-8.

Yatim, P. (2010), "Board structure and the establishment of a risk management committee by Malaysian listed firms", *Journal of Management & Governance*, Vol. 14 No. 1, pp. 17-36.

Yusoff, H. and Darus, F. (2014), "Mitigation of climate change and prevention of pollution activities: environmental disclosure practices in Islamic financial institutions", *Procedia-Science and Behavioural Sciences*, Vol. 145, pp. 195-203.

Zubaidah, Z.Z., Nurmala, M.K. and Kamamzaman, J. (2009), "Board structure and corporate performance in Malaysia", *International Journal of Economics and Finance*, Vol. 1 No. 1, pp. 150-164.

Further reading

ACCA (2003), *Environmental Reporting Guidelines for Malaysian Companies*, Kuala Lumpur: ACCA and Ministry of Science, Technology and Environment, Kuala Lumpur.

Adekoya, A. and Ekpenyong, E. (2009), "Corporate governance and environmental performance: three point strategy for improving environmental performance among corporations in Africa", *IAIA 09 Conference Proceedings, Impact Assessment and Human Wellbeing*.

Adeyemi, S.B. and Owolabi, S.A. (2008), "Environmental accounting for national development", *Babcock Journal of Management and Social Sciences*, Vol. 5 No. 2, pp. 18-28.

Ahmad, N.S.M. and Ishwerf, A.I. (2014), "Forces and obstacles for corporate environmental disclosures (CED) in Libya: perspective of stakeholders", *Review of Integrative Business and Economics Research*, Vol. 3 No. 1, pp. 65-79.

Al-Ajmi, J. (2008), "Audit and reporting delays: evidence from an emerging market", *Advances in Accounting*, Vol. 24 No. 2, pp. 217-226.

Alikhani, R. and Maranjory, M. (2013), "An investigation on the relationship between social and environmental information disclosure Jevelan firm's performance in Iran", *International Research Journal of Applied and Basic Sciences*, Vol. 5 No. 1, p. 125.

Alhaji, I.S. (2014), "Corporate governance and financial reporting quality in the Nigerian oil marketing industry", *3rd Annual AFRA Conference*.

Arshad, R., Abdul Fatah, M.M. and Othrnan, R. (2014), "Board composition, Islamic corporate social responsibility and corporate reputation of Islamic banks", *Proceedings of World Business and Economics Research Conference, Auckland, Accounting Research Institute, Ministry of Education, Malaysia and Universiti Teknologi MARA*, pp. 1-17.

Asechemie, D.P.S. (1996), *Elements of Corporate Financial Accounting and Reporting*, University of port Harcourt Press, Port Harcourt.

Asteriou, D. and Hall, S.G. (2007), *Applied Econometrics: A Modern Approach Using Eviews and Microfit*, Palgrave Macmillian, New York, NY.

Baltagi, H.B. (2008), "Forecasting with panel data", *Journal of Forecasting*, Vol. 27 No. 2, pp. 153-173.

Bhattacharyya, A. (2014), "Factors associated with the social and environmental reporting of Australian companies", *Australian Accounting Business and Finance Journal*, Vol. 8 No. 1, pp. 25-50.

Central Intelligence Agency, Government USA, Nations, U., Nations United, DFT, & Center for History and New Media (2012), *CIA - The World Fact Book*, Central Intelligence Agency, Cape Verde.

Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., L. Erlbaum, Hillsdale, NJ.

Cornier, D. and Magnan, M. (1999), "Corporate environmental disclosure strategies: determinants, costs and benefits", *Journal of Accounting, Auditing and Finance*, Vol. 14 No. 4, pp. 429-451.

De Lacy, G. (2005), "How to review and assess the value of board subcommittees", *Australian Institute of Companies Directors*, pp. 1-24.

Deloitte Touche Tohmatsu International (1993), *Coming Clean – Corporate Environmental Reporting, Opening for Sustainable Development*, Deloitte Touche Tohmatsu International, London.

Drukker, D.M. (2003), "Testing for serial correlation in linear panel-data models", *Stata Journal*, Vol. 3 No. 2, pp. 168-177.

Ebimobowei, A. (2011), "A study of social accounting disclosures in the annual reports of Nigerian companies", *Asian Journal of Business Management*, Vol. 3 No. 3, pp. 145-151.

Eweje, G. (2006), "Environmental costs and responsibilities resulting from oil exploitation in developing countries: the case of the Niger Delta of Nigeria", *Journal of Business Ethics*, Vol. 69 No. 1, pp. 27-56, doi: 10.1007/s10551-006-9067-8.

Ford, H.A.J., Austin, R.P. and Ramsay, I.M. (1999), *Ford's Principle of Corporation's. Law*, 9th ed., Butter Worths, Sydney.

Fox, J. (1991), *Regression Diagnostics: An Introduction*, Vol. 79, Sage, Thousand Oaks, CA.

Frias-Aceituno, J.V., Rodriguez-Ariza, L. and Garcia-Sanchez, I.M. (2012), "The role of the board in the dissemination of integrated corporate social responsibility", *Corporate Social Responsibility and Environmental Management*, Vol. 20 No. 4, pp. 219-233.

Genser, B., Cooper, P.J., Yazdanbakhsh, M., Barreto, M.L. and Rodrigues, L.C. (2007), "A guide to modern statistical analysis of immunological data", *BMC Immunology*, Vol. 8 No. 1.

Gray, R., Collison, D. and Bebbington, J. (1997), *Financial Reporting Today: Current Trends and Emerging Issues*, Accountancy Books, Dundee.

Gray, R., Kouhy, R. and Lavers, S. (1995), "Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure", *Accounting, Auditing & Accountability Journal*, Vol. 8 No. 2, pp. 47-77, available at: http://dx.doi.org/l0.1108109513579510146996

Greene, W.H. (2003), *Econometric Analysis*, Pearson Education, New York, NY.

Gujarati, D. and Porter, D. (2003), "Multicollinearity: what happens if the regressors are correlated?", in Gujarati, D.N., Porter, D.C. and Gunasekar, S. (Eds), *Basic Econometrics*, Tata McGraw-Hill Education Pvt Ltd, New York, NY, p. 363.

Gujarati, D.N. and Porter, D.C. (2009), *Causality in Economics: The Granger Causality Test. Basic Econometrics*, 5th international ed., McGraw-Hill, New York, NY, pp. 652-658.

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2013), *Multivariate Data Analysis: Pearson New International Edition*, Pearson, Upper Saddle River, NJ.

Hair, J.F. Jr, Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2010), *Multivariate Analysis Data Analysis*, Prentice Hall, Upper Saddle River, NJ.

Harte, G. and Owen, D. (1991), "Environmental disclosure in the annual reports of British companies: a research note", *Accounting, Auditing and Accountability Journal*, Vol. 4 No. 3, pp. 51-61.

Hausman, J.A. (1978), "Specification tests in econometrics", *Econometrica: Journal of the Econometric Society*, Vol. 46 No. 6, pp. 1251-1271.

Henderson, B.C. and Kaplan, S.E. (2000), "An examination of audit report lag for banks: a panel data approach", *Auditing: A Journal of Practice & Theory*, Vol. 19 No. 2, pp. 159-174.

Holland, L. and Foo, Y.B. (2003), "Differences in environmental reporting in the UK and US: the legal and regulatory context", *The British Accounting Review*, Vol. 35 No. 1, p. 1.

Hossain, M., Perera, M.H.B. and Rahman, A.R. (1995), "Voluntary disclosure in the annual reports of New Zealand companies", *Journal of International Financial Management & Accounting*, Vol. 6 No. 1, pp. 69-87.

Ienciu, I.A., Popa, I.E. and Ienciu, N.M. (2012), "Environmental reporting and good practice of corporate governance: petroleum industry case study", *Procedia Economics and Finance*, Vol. 3, pp. 961-967.

Iyoha, F.O. (2010), "Social accounting; an imperative for enterprise development", *Nigerian Accountant*, Vol. 43 No. 1, pp. 4-8.

Jagongo, A.O. and Makori, D.M. (2013), "Environmental accounting and firm profitability: an empirical analysis of selected firms listed in Bombay Stock Exchange", *International Journal of Humanities and Social Science*, Vol. 3 No. 18, pp. 248-256.

Jensen, M.C. (1986), "Agency cost of free cash flow, corporate finance, and takeovers: corporate finance, and takeovers", *American Economic Review*, Vol. 76 No. 2, pp. 323-329.

Jike, V.T. (2004), "Environmental degradation, social disequilibrium, and the dilemma of sustainable development in the Niger-Delta of Nigeria", *Journal of Black Studies*, Vol. 53 No. 5, pp. 686-701, doi: 10.1177/0021934703261934.

Judge, W.Q., Naoumova, I. and Koutzevol, N. (2003), "Corporate governance and firm performance in Russia: an empirical study", *Journal of World Business*, Vol. 38 No. 4, pp. 385-396.

Khodadadi, V., Khazami, S. and Aflatooni, A. (2010), "Effect of corporate governance structure on ;the extent of voluntary disclosure in Iran", *Business Intelligence Journal*, Vol. 3 No. 2, pp. 151-164.

Krippendorff, K. (2004), *Content Analysis: An Introduction to its Methodology*, 2nd ed., Sage Publication, London.

Krejcie, R. and Morgan, D. (1970), "Determining sample size for research activities", *Educational and Psychological Measurement*, Vol. 30, pp. 607-610.

Linck, J.S, Netter, J.M. and Yang, T. (2008), "The determinants of board structure", *Journal of Financial Economics*, Vol. 87 No. 2, pp. 308-328.

Mahmud, H., Lin, M.T. and Mike, A. (1994), "Voluntary disclosure in an emerging capital market: some empirical evidence from companies listed on the Kuala Lumpur stock exchange", *International Journal of Accounting*, Vol. 29 No. 4, pp. 334-351.

Milne, M.J. and Adler, W. (1999), "Exploring the reliability of social and environmental disclosures content analysis", *Accounting, Auditing & Accountability Journal*, Vol. 12 No. 2, pp. 237-256.

Mustafa, N.H., Abdul Latif, R. and Taliyang, S.M. (2011), "Expropriation of minority shareholders' rights: evidence from Malaysia", *International Journal of Business and Social Science*, Vol. 2 No. 13, pp. 215-220.

Naser, K., Al-Khatib, K. and Karbhari, Y. (2002), "Empirical evidence on the depth of corporate information disclosure in developing countries: the case of Jordan", *International Journal of Commerce and Management*, Vol. 12 Nos 3/4, pp. 122-155.

Oyebode, A. (2009), *The Imperative of Corporate Governance in Nigeria*, Nigerian Village Square.

Oyerinde, A.A. (2014), "Corporate governance and bank performance in Nigeria: further evidence from Nigeria", *International Journal of Business and Management*, Vol. 9 No. 8, p. 133.

Pallant, J. (2011), "Multivariate analysis of variance: SPSS survival manual", *Crow's Nest: Allen & Unwin*, Vol. 20 No. 11, pp. 283-296.

Patro, S., Lehn, K. and Zhao, M. (2003), "Determinants of the size and structure of corporate boards: 1935-2000", *Financial Management*, Vol. 38, 2009.

Ramsey, J.B. (1974), "Classical model selection through specification error tests", *Frontiers in Econometrics*, pp. 13-47.

Salgado-Ugarte, I.H. and Perez-Hernandez, M.A. (2003), "Exploring the use of variable bandwidth kernel density estimators", *Stata Journal*, Vol. 3 No. 2, pp. 133-147.

Setyorini, C.T. and Ishak, Z. (2012), "Corporate social and environmental disclosure: a positive accounting theory view point", *International Journal of Business and Social Science*, Vol. 3 No. 9, pp. 152-164.

Simonoff, J.S. and Tsai, C.-L. (1999), "Semi parametric and additive model selection using an improved Akaike information criterion", *Journal of Computational and Graphical Statistics*, Vol. 8 No. 1, pp. 22-40.

Tabachnick, B.G. and Fidell, L.S. (2007), "Multivariate analysis of variance and covariance", *Using Multivariate Statistics*, Vol. 3, pp. 402-407.

Thompson, M. (2006), "Representing data distributions with kernel density estimates", *AMC Technical Brief*, Vol. 4, pp. 1-2.

Ullah, M.H., Hussain, M.M. and Yakub, K.M. (2014), "Environmental disclosure practices in annual report of listed textile industries in Bangladesh", *Global Journal of Management and Business Research: Accounting and Auditing*, Vol. 14 No. 1, pp. 97-108.

United Nations World Commission on Environment and Development (1987), *Our Common Future*, 1st ed., Oxford University Press, Oxford, p. 400.

Wilmshurst, T.D. and Frost, G.R. (2000), "Corporate environmental reporting: a test of legitimacy theory", *Accounting, Auditing and Accountability Journal*, Vol. 13 No. 1, pp. 10-26.

Wooldridge, J.M. (2010), *Econometric Analysis of Cross Section and Panel Data*, MIT press, Cambridge, MA.

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