The Moderating Effects of Social-Sustainability on Corporate Characteristics' Relationship with Environmental-Sustainability Reporting

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Abstract - Due to the greater influence of sustainability issues on today's global matters, this research observed how social-sustainability could influence the relationship between specific firm characteristics of firm age, audit firm, effective tax rate and environmental-sustainability disclosure. This area is a very wide gap that is yet to be fully explored especially as it affects developing economies. In this study, the researcher covers the entire environmentally sensitive sector of the Nigerian economy with 67 companies chosen as sample size for the study. Measurement of the dependent and moderating variables was done through simple average disclosure index (SADI) which, is the simple average of the total disclosure made on individual elements under these two observations. The framework and model of the study were built on the moderating effects of social-sustainability on the relationship between specific corporate characteristics and environmental-sustainability reporting. Using Stata13 the study tests for the level of disclosure of environmental-sustainability, types, direction, and impacts of the relationships between the specific corporate characteristics and environment-sustainability reporting; and the significance of the influence of the relationship. The results show among other things that a positive and significant relationship exists between firm age, audit firm & effective tax rate, and environmental-sustainability reporting. Furthermore, it was discovered that high environmentally sensitive elements such as biodiversity & wastes, effluents, product impacts and environmental management department; have lower disclosure rates compared to lower environmental elements like materials used and energy consumed.

Keywords - social-sustainability, environmental-sustainability, environmental reporting, firm age, audit firm, effective tax rate (ETR), specific corporate characteristics (SCC)

1. INTRODUCTION

In the words of Kolk (2004), the era of publication of separate environmental reports beginning in 1989, have seen tremendous increase in company's publication of "information on its environmental, social or sustainability policies and/or impacts..." So also, has there been increase in environmental disclosure rules, regulations, standards, and guidelines. In Nigeria, we are familiar with disclosure standards like Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN), National Environmental Standard and Regulations (NESR), ISO 14001, Global Reporting Initiative (GRI), etc. "Organizations have come to realize that meeting stakeholder expectations is as necessary a condition for sustainability as the need to achieve strategic business objective" (Ballou, Heitger & Landes, 2006). With time sustainability, reporting has moved from underdeveloped to developed economies and has shifted to long-term concerns from medium-terms (Schick, 2005). Since the recognition of sustainability disclosure, GRI has fast become the most popular and generally acceptable sustainability disclosure standard. In disclosing sustainability information using GRI standards and guidelines, two basic aspects are applied in addition to the economic aspect: environmental category and social category (Initiative, 2013). These two categories gives a measure of the level of disclosure of sustainability information. While the environmental sustainability measures an organization operational impact on living and non-living natural systems on land, air, water and the ecosystem, the social category of sustainability is concern with the impact an organization has on the society within which it carries out its business (Initiative, 2013). Sustainability disclosure is broadly concern with information regarding General Standard Disclosure (GSD) and Specific Standard Disclosure (SSD). The SSD specifically discloses economic, environmental, and social information. Most annual financial statements covers these three elements based on what is regarded as the Triple Bottom Line (TBL) reporting system (Adams, 2004).

Many literatures have investigated sustainability reporting relationships in totality. That is, it has been applied in broad perspective that includes the economic, environmental, and social categories of the GRI guidelines. Hardly has there been any attempt to treat these three categories independently. There is however, the need to know the influence of firm's characteristics on individual categories and how it influences host communities and society. It is in this light that the study was built on a relationship that examines the indirect social-sustainability impact on environmental disclosure independently. The model so built in this association is the influence of some specific corporate characteristics (SCC) on the environmental category of SSD through the moderating impact of the social category GRI sustainability disclosure standard. In other words, a framework that examines the relationship between SCC like firm age, audit firm and effective tax rate (ETR) and environmental sustainability was built, with social-sustainability playing a moderating role (see research framework).

The write-up is therefore, aimed at determining the moderating impact of social sustainability on the relationship between SCC in the form of firm age, audit firm and ETR and environmental sustainability information disclosure. The result of this study could go a long way in shaping the importance of social issues on firm's operations concerning sustainability reporting. Based on this the researcher intends to justify the null assertion that:

H₀₁ there is no significant moderating social-sustainability effects on the relationship between specific corporate characteristics and environmental-sustainability reporting by Nigerian companies.

The presentation of materials for the study has been organized into five parts or sections. The general introduction, which gives the background, problem, and objectives of the study, was discussed in the first part. This was followed by a review of relevant literature on environmental and social reporting categories of GRI sustainability guidelines; firm age, audit firm, and effective tax rate (ETR). The research methodology and assessment of data are in the third and fourth sections respectively. The final part is the conclusion that, consists of a summary of the entire work, main findings of the study, recommendations on the findings and future studies prospects.

2. REVIEW OF RELEVANT LITERATURE

2.1 Introduction

Social justice is fast becoming a norm in business operations. The need for sustainable development and accountability has forced companies' disclosure of nonfinancial information. The GRI reporting framework is one of the nonfinancial disclosure standards that offers reporting principles, standards, regulations, rules, and manuals for the preparation of sustainability reports by organizations. The 2013 version of GRI popularly known as GRI4 or simply G4, provides for two types of disclosures under Standard Disclosure of sustainability information (Initiative, 2013):

1. General Standard Disclosure (GSD)
2. Specific Standard Disclosure (SSD)

The GSD is on the broad aspects of an organizations' attributes and covers areas like organizations' strategy & analysis, organizational profile, material aspects & boundaries and stakeholders' engagements. Others are report profile, governance, and ethics & integrity. The SSD on the other hand deals with the three aspects of TBL reporting, viz: economic, environmental, and social information disclosure.

While the study recognizes the GSD and the economic aspect of SSD, discussions for this research work will concentrate on the GRI's (G4) environmental and social categories of sustainability reporting. These two categories serves as the dependent variable and the moderating variable respectively for this research piece. Additionally, the section reviews the independent variables of firm age, audit firm, and ETR in relation to sustainability disclosure. It must be emphasized that aspects to be disclosed are aspects that are "material" to the organization's operations.

2.2 Specific Global Reporting Initiative Disclosure

2.2.1 Economic Sustainability Disclosure (G4-EC1 to G4-EC9)

This deals with information disclosure concerning a company's impact on the economic conditions of its stakeholders and the economic system in general. It illustrates the flow of capital among different stakeholders at local, national, and global levels.

2.2.2 Environmental Sustainability Disclosure (G4-EN1 to G4-EN34)

Environmental sustainability disclosure deals with a firm's operational impact on the biodiversity, which, comprises both living and non-living natural system (Initiative, 2013). The ecosystem made up of land,

air and water could be damaged during the production process of a firm through input related impact such as energy and water, or the output related effects of emission, effluents, & wastes. It is incumbent on a firm's accounting system to make disclosure on these aspects including transport, product & service related impacts as well as environmental compliance and expenditure (Initiative, 2013).

The G4 Sustainability Reporting Guidelines provides for vital environmental information to be disclosed under the Environmental Category (G4-EN1 to G4-EN34) of "Standard Disclosures" (Section 5).

2.2.3 Social Sustainability Disclosure

Social sustainability is about an organization's impact on the social system within which it operates (Initial, 2013), especially the immediate or host community.

2.2.3.1 Labour Practices & Decent Work

This sub-category deals with labour practices based on internationally recognized universal Standards and Conventions of the United Nations (UN), International Labour Organization (ILO), and the Organization for Economic Cooperation & Development (OECD).

2.2.3.2 Human Rights

Human rights aspect covers incidence of human rights laws enforcement, protection, violations and changes in stakeholder's ability to exercise and enjoy the fundamental rights under the UN Declaration and Conventions of 1948 and 1966.

2.2.3.3 Society

Society covers organization's impact on host, local and immediate communities and on society in general.

2.2.3.4 Product Responsibility

This sub-category concerns with the product and services that have direct influence all stakeholders, in particular the customers. Below is a diagrammatic flow of GRI reporting disclosure as adopted from Haladu (2018).

Figure 2.1
GRI Disclosure Framework
Source: Haladu (2018)

2.3 Sustainability Information Disclosure Relationships

Sustainability reporting otherwise referred to as environmental reporting or corporate social reporting or nonfinancial reporting, or social reporting, has been covered by many literature and results obtained so far have been mixed. The most popular researches in the subject matter concerns its relationship with corporate characteristics. de Villiers, Naiker and van Staden (2011), looked at the relationship between board characteristics and firm environmental performance. Basing the work on the agency and resource dependence theories, they discovered a positive relationship between board independence and environmental performance. Low quality environmental reporting disclosure targeting good corporate governance citizen image was the discovery of Alrazi, Sulaiman and Nik Ahmad (2009) who applied “self-constructed disclosure index”. They discovered that quality of voluntary environmental disclosure is higher by larger firms closely related to environmental concerns (Brammer & Pavelin, 2008) and that it has nothing to do with the media exposure of a firm. A significant difference in environmental reporting practices exists among Egyptian corporate entities (Rizk, Dixon & Woodhead, 2008). Former literatures failed to examine the moderating effects of social-sustainability on any of these relationships and did not exclusively treat the any of the specific standard disclosures.

2.4 Specific Corporate Characteristics

2.4.1 Firm Age

Firm age is very significant in the disclosure of sustainability information of a firm. Older and more experienced firms must have gained the expertise needed in being efficient and effective. The more experience they are the better they could handle environmental and social issues. It is therefore, expected that older firms make more disclosure on environmental reporting than newly established ones. Newly incorporated firms might have had little or no experience from their operations on environmental and social matters. They are therefore, expected to disclose little or nothing of sustainability nature. Corporate bodies with 15 to 20 years operating experience might have learnt a lot about the environment and communities in which they carry out their operations. This makes it possible for them to have more disclosure on environmental issues. Cormier, Magnan and van Velthoven (2005) tried to identify determinants of corporate environmental disclosure using the institutional theory and focusing on Europe’s largest economy (Germany). One of the result they got was that fixed assets age determine the level of environmental disclosure. Firm age has a positive and insignificant relationship with environmental disclosure (Eljido-Ten, 2009). In their study of the motivation of environmental management system (EMS) by the adoption of different practices Khanna and Anton (2002), were able to discover that environmental auditing was to be motivated more strongly by regulatory pressure.

2.4.2 Audit Firm

Auditing and assurance services improve the confidence and image of a firm to the outside world. Of greater significance in this respect is the quality of the auditor. At global level what usually use to be the Big Five (Ahmad, Hassan and Muhammad, 2003) has now been reduced to the Big Four auditing firms of Deloitte, PriceWater Coopers, Earnest Young and KPMG (Kornberger, Carter an Ross-Smith, 2010; Christodoulou, 2011). The Big Four accounting firms avoids auditing companies that are not making disclosure on environmental issues. To gain universal recognition therefore, firms must disclose on corporate social responsibility. Thus attracting Big Four auditors and improve its image and prestige. Therefore, firms audited by the Big Four accounting firms disclose more on environmental reporting than firms not audited by the Big Four. Auditors of the Big Four firms are less likely to be associated with firms that discloser less on environmental issues. Ahmad, Hassan and Mohammad (2003) discovered a positive and significant relationship between the Big Five auditing firms of listed companies in the Kuala Lumpur Stock Exchange (KLSE). Positive and significant relationship was also the result by other studies (Bewley & Li, 2000; Khanna, & Anton, 2002). The work of Sun, Nan, Aly Salama, Khaled Hussainey, and Murya Habbash (2010) however, showed an inverse relationship.

2.4.3 Effective Tax Rate (ETR)

Taxation is a service that is of great burden on companies. For this reason, every firm tries to reduce or avoid higher tax burden through attracting tax incentives, reliefs, and allowances. Disclosure of environmental and social information is one such means of attracting some tax incentives and this serves as a greater motivation for firms to disclose more on environmental issues. A positive but insignificant relationship have been found to exist between environmental reporting and ETR (Ahmad *et al.*, 2003). Negative and insignificant relationship is the result of Smith, Yahya, and Amiruddin (2007). In a study, comprising some 408 publicly listed Australian corporations Lanis and Richardson (2012) found that, the higher the level of environmental

disclosure, the lower is the level of tax aggressiveness. This gives rise to a relationship that is negative and significant between environmental reporting and tax aggressiveness. In the same vein, positive and significant relationship exists between corporate social reporting and ETR (Muller & Kolk, 2015).

3. RESEARCH METHODOLOGY

The research aims at examining the moderating effects of social-sustainability on the relationship between specific corporate characteristics (SCC) in the form of firm age, audit firm, and effective tax rate (ETR); and environmental-sustainability reporting (ESR). Targeting environmentally sensitive firms in the Nigerian economy, the population of the study constitutes 81 companies in the agriculture, construction/real estate, healthcare, industrial goods, natural resources, and oil & gas industries. Of these, 67 firms were selected as sample size. Data for the study was sourced through secondary sources from annual financial reports and published financial statements on the internet covering the period 2009 to 2014. The data was then analysed using Stata13 analytical tool to determine the level of environmental-sustainability information disclosure. Further analysis was done to show the impact of the moderating effects of social-sustainability on the relationship between SCC and environmental sustainability reporting, and the type and level of relationship and its significance.

Figure 3.1
Theoretical Framework of the Research

The above framework is represented on the model given as:

$$ESR_{it} = a + SS_{it} (\beta_1 FAG_{it} + \beta_2 AFM_{it} + \beta_3 ETR_{it}) + \varepsilon \quad (1)$$

Where:

ESR_{it} = environmental sustainability reporting

a = constant term

SS = social sustainability

β_n = coefficient

FAG = firm age

AFM = audit firm

ETR = effective tax rate

ε = error term at 5% level of significance

The framework of the research is based on the legitimacy theory (firm age), agency theory (audit firm) and stakeholder theory (ETR). Firm age, which show the age of the firm since incorporation is based on the legitimacy theory. The older a firm is the more it attracts public attention through its image. It is expected that older firms disclose more information on environmental-sustainability as they attract greater public interest due to third goodwill or negative goodwill, thus the need to protect their image. Older firm's age is an indication of efficiency and effectiveness in its operation. Therefore, the need to protect that reputation by operating through due process in compliance with all rules, guidelines, standards, regulations, laws, etc.

The type of firm show the confidence that shareholders and other stakeholders may built in the company. Thus, the agency theory is determined by the percentage of firms audited by the Big Four auditing

firms. Reputable auditors give good accounts of “agents” to their “principals”. Therefore, the relationship between audit firm and environmental-sustainability reporting is based on the agency theory.

Effective tax rate’s relationship with environmental-sustainability reporting is based on the stakeholders’ theory. Through taxation, stakeholders (especially host communities) other than shareholders are compensated. Tax revenue is collected from companies to provide and upgrade essential services for the immediate or host communities and for society. The framework of the study (Figure 3.1) gives a diagrammatical representation of the three theories.

These variables were measured using content analysis, period, and percentages. Table 3.1 gives details about measurement instruments (units, indices, and theories) on which the variables are based. It should be noted that the simple average disclosure index used to measure both the moderating variable (social-sustainability) and dependent variable (environmental-sustainability) were based on the latest sustainability guidelines of the Global Reporting Initiative (GRI) known as G4 introduced in 2013, which, has been rearranged into only six elements for the purpose of this research (Figure 3.1). Disclosure by firm of the major items of this standard attracts one mark while non-disclosure attracts zero mark. The total marks scored was then expressed into a simple average, which forms the index for the measurement of these variables.

Table 3.1
Measurement of Variables

Variables	Type	Measurement	Index	Underpinning Theory
Environmental Sustainability Reporting	Dependent Variable	Content Analysis (0, 1)	Simple Average Disclosure Index	-
Social Sustainability	Moderating Variable	Content Analysis (0, 1)	Simple Average Disclosure Index	-
Firm Age	Independent Variable	Date of Incorporation	Number of Years	Legitimacy
Audit Firm	Independent Variable	Content Analysis (0, 1)	Big Four Auditing Firms	Agency
Effective Tax Rate	Independent Variable	(Tax-payable/NPAT)100	Tax-payable Rate	Stakeholder

Source: Formulated by author from literature

4. Data Presentation and Analysis

4.1 Introduction

This section deals with the analysis of data with the application of Stata13 analytical tool. Evaluation was done in three faces. The first is general assessment of the average disclosure of all variables including their minimum and maximum disclosure values and standard deviation. The second part of the analysis is the determination of relationships between the variables and the test for collinearity. The final segment is a regression analysis to test for the type, impact, and significance of all relationships with environmental-sustainability reporting.

4.2 Descriptive Statistics

The six elements (material, energy, biodiversity & wastes, effluents, product environmental impact and environmental management department), that measures environmental-sustainability reporting are evenly distributed in the dataset as the individual values of the standard deviation are less than one (Table 4.1). The same could be said for environmental-sustainability reporting (ESR) index. The minimum and maximum values were 0 and 1 respectively for all the six elements and ESR. From Table 4.1 again, only material used and energy consumed have higher disclosures of 86.89% and 64.27% respectively. These two shows the best result for all the elements used to measure ESR. Average disclosure between material and energy is estimated to be 75.58%. The remaining elements all shows results of less than 35%. Their results of disclosures shows effluents (24.42%), biodiversity & wastes (21.85%), products environmental impact (30.59%) and environmental management department (30.08%). This gives an average disclosure of these four elements of 26.74%. This result is an indication of the poor disclosure of the key elements of ESR. Elements like biodiversity & wastes and effluents are key pollutants of environmentally sensitive firms that have direct bearings on ESR. The fact that they are poorly disclosed by firms is an indication of improper supervision. The average disclosure of ESR index is 43.02%. Though a little bit encouraging, this index is made high due to the high disclosure on material and energy elements (inputs). Nonetheless, output pollutants that affects the host communities and other immediate communities in the society are poorly disclosed.

Table 4.1
Average Disclosures on Variables

Variables	Mean	Standard Deviation	Minimum	Maximum
Environmental Sustainability Variables				
Materials Used	0.8689	0.3380	0	1
Energy Consumed	0.6427	0.4798	0	1
Biodiversity & Wastes	0.2442	0.4302	0	1
Effluents	0.2185	0.4138	0	1
Product Environmental Impact	0.3059	0.4614	0	1
Environmental Management Department	0.3008	0.4592	0	1
Dependent and Independent Variables				
Environmental Sustainability Reporting (ESR)	0.4302	0.3245	0	1
Firm Age	40.8226	24.4472	7	130
Audit Firm	0.2494	0.4332	0	1
Effective Tax Rate (ETR)	26.2812	16.9589	-3.0200	79.9100

Source: Computed by Researcher using Stata13

Specific corporate characteristics (SCC) represented by firm age, audit firm and ETR, shows mixed results. The mean firm age is about 41 years. At this age of operation, firms are expected to have gained a lot of experience. Thus, making them not only to be effective in their operations but also to be more efficient. The age distinction in the dataset is however, not even as the result of the standard deviation seems to suggest (24.4472). The minimum age of firms in the distribution is seven years while the maximum age is 130 years, exposing the massive disparity in firm's efficiency and effectiveness.

For audit firms, only about 24.94% of firms were audited by the Big Four auditing firms (Deloitte, Pricewater Coopers, Ernest Young and KPMG). Though the distribution of data is very good (0.4332 standard deviation), this result seem to suggest the low quality of auditing and assurance services of listed environmentally sensitive firms. By implication, almost 75% of companies' annual financial statements are not audited by internationally reputable auditing firms. The minimum and maximum scores for this variable were zero and 100% respectively.

The average ETR is 26.28% of net profit after tax (NPAT). Though not evenly spread among companies (standard deviation of 16.9589), the rate is not encouraging at all. The minimum disclosure is 3.02% allowances, while the maximum rate disclosed is 79.91% tax. Legally, corporate income tax rate in Nigeria is 30% of assessable income (pwc, 2016). A critical examination of the average ETR however, shows a fall of 3.72% in tax rate. The effects of this is a general fall in government revenue from corporate bodies.

4.3 Correlation Index

Table 4.2
Correlation Matrix

Variables	Environmental Sustainability Reporting (ESR)	Firm Age	Audit Firm	Effective Tax Rate (ETR)
Environmental Sustainability Reporting (ESR)	1.0000			
Firm Age	0.6567***	1.0000		
Audit Firm	0.3115***	0.2438***	1.0000	
Effective Tax Rate (ETR)	0.6035***	0.4716***	0.3769***	1.0000

Source: Computed by Researcher using Stata13

The values of the correlation coefficients (r) indicate the strength of the relationship among variables (Al-Matari, 2013). This relationship is estimated by values of between 0 and 1. Hair, Black, Babin, & Anderson (2010) suggested that a correlation coefficient of 0 indicate no relationship and a correlation coefficient of ± 1 demonstrates the existence of a perfect relationship. The interpretation of correlation between 0 and ± 1 could be classified into three: weak, medium, and strong (Al-Matari, 2013; Alreyami, 2012; Lakkanawani, 2013; Salim, 2011; Pantamee, 2014). A weak relationship has correlation coefficient values of between ± 0.1 and ± 0.29 . When the correlation values fall between ± 0.30 and ± 0.49 a medium or moderate relationship is said to exist, and for values of ± 0.50 and above denotes strong relationship.

The correlation matrix (Table 4.2) shows a high degree of relationship between social-sustainability plus specific corporate characteristics and environmental-sustainability reporting. While the relationship for audit firms was moderate (31.15%) that of firm age and ETR were very strong with correlation matrices of 65.67% and 60.35% respectively. The correlation results shows that all the relationships are highly significant at 1% level of significance. The dataset was also clear of any abnormality and collinearity as none of the matrix

values is up to 80%. It can therefore, be rightly concluded that the distribution not only have a strong significant relationship (an average of 52.39%), but a normal and highly significant dataset.

4.4 Regression Analysis

From Table 4.3, the collective significance of the variable shows a very high level of significance ($f = 0.0000$). The impact of specific corporate characteristics is to the value of 54.55% on environmental-sustainability disclosure (R^2 value). This shows the degree of change on environmental-sustainability reporting as a result of changes in the predictors is strong. On individual basis, a change in firm age by one year changes ESR by 0.72%. Audit firm changes ESR by 7.5% for each changes in it and a 1% rise in ETR sees ESR changes by 0.83%. All the three relationships (firm age, audit firm and ETR) with ESR are positive and significant. However, while firm age and ETR are highly significant at 1% level of significance, audit firm is significant at 10% level of significance. This result gives a high rate or degree of responsiveness of ESR to changes in specific corporate characteristics. Of specific importance in this relationship is the fact that all the relationships between ESR and the specific corporate characteristics of firm size, audit firm and ETR are positive. This means an increase in these predictors leads to corresponding increases ESR and vice versa.

Table 4.3
Regression Results

F value	0.0000			
R²	0.5455			
Environmental Sustainability Reporting	Coefficient	Standard Deviation	t value	p-value
Firm Age	0.0072	0.0006	12.11	0.0000
Audit Firm	0.0751	0.0454	1.66	0.0990
Effective Tax Rate	0.0083	0.0009	8.72	0.0000
Constant	0.1670	0.0166	10.07	0.0000

Source: Computed by Researcher using Stata13

5. CONCLUSION

5.1 Summary

The question of how social-sustainability could influence the relationship between firm age, audit firm, ETR, and environmental-sustainability disclosure is yet to be fully explored especially as it affects developing economies. This study covers the entire environmentally sensitive sector of the Nigerian economy with 67 companies chosen as sample size for the study. Measurement of the dependent and moderating variables was done through simple average disclosure index (SADI) which, is the simple average of the total disclosure made on individual elements under these two observations. The relationship of the framework and model of the study was between the moderating effects of social-sustainability on the influence of specific corporate characteristics and environmental-sustainability reporting. Using Stata13 the study tests for the level of disclosure of environmental-sustainability, types, direction, and impacts of the relationships between the SCC and environment-sustainability reporting; and the significance of the influence of the relationship. Results so received were stated in the findings of the study.

5.2 Findings and Conclusions

A thorough analysis of the data produce the following results and their implications.

- The level of environmental sustainability reporting is 43.02%, which is appreciably high by underdeveloped economy standards. This could be acceptable in the sense that G4 is a new development in environmental reporting.
- Firm ages was about 41 years on average making the firms in the study to be highly experience, effective and efficient.
- 24.94% of firms were audited by the Big Four auditing firms of Delloitte, Pricewater Coopers, Ernest Young and KPMG. This means the majority of firms in the economy are being audited by less recognized accounting bodies thus, making their financial statements questionable.
- A strong relationship exists between SCC and environmental sustainability reporting. About 55.55% on average with the complete absence of abnormality and collinearity between the variables.
- A positive and significant relationship exists between SCC and environmental-sustainability reporting.
- High environmentally sensitive elements such as biodiversity & wastes, effluents, product impacts and environmental management department have lower disclosure rates (26.74%) compared to lower environmental elements like those that material used and energy consumed (75.58%). This is an indication of the poor disclosure on highly toxic environmental wastes by firms in the economy.

5.3 Recommendations

The application of social-sustainability as a moderator have shown that SCC will have greater impact on environmental-sustainability information disclosure. Therefore, in enforcing sustainability, guidelines, rules, regulations, laws, or standards on firms; more emphasis should be placed on social issues as they have the effects of greatly influencing corporate characteristics like company age, audit firm, and ETR. Higher monitoring of social guidelines by the appropriate authorities could lead to much higher impact. Thus leading to higher levels of environmental-sustainability reporting rates.

5.4 Limitations and Further Studies

One of the weaknesses of this study is that non-sensitive environmentally sensitive firms were not considered for this research. Besides, classifying Nigeria into different sustainability zones and their sustainability impacts could also prove to be a good research topic. The northern part of Nigeria is for instance, plagued by environmental problems like drought and desertification; while the southern part is threatened by environmental issues like soil erosion, oil spillage and gas flaring. These are virgin areas of exploration in terms of sustainability reporting.

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APPENDIX

```
. xtsum materialused energy effluents biodiversitywastes environmentalimpactofproduct
environmentalmanagementdepartmen environmentalstainab
```

```
> ilitydiscl firmage auditfirm effectivetaxrate mfirmage mauditfirm meffectivetaxrate
```

Variable	Mean	Std. Dev.	Min	Max	Observations
materi~d overall	.8688946	.3379503	0	1	N = 389
energy overall	.6426735	.4798293	0	1	N = 389
efflue~s overall	.2442159	.4301746	0	1	N = 389
biodiv~s overall	.218509	.4137668	0	1	N = 389
enviro~t overall	.3059126	.4613863	0	1	N = 389
enviro~n overall	.3007712	.459184	0	1	N = 389
enviro~l overall	.4301568	.3244796	0	1	N = 389
firmage overall	40.82262	24.44723	7	130	N = 389
auditf~m overall	.2493573	.4331982	0	1	N = 389
effect~e overall	26.2812	16.95892	-3.02	79.91	N = 389
mfirmage overall	19.90603	21.23197	0	130	N = 389
maudit~m overall	.1171062	.2662458	0	1	N = 389
meffec~e overall	13.34808	14.01292	-3.02	79.91	N = 389

```
. pwcorr environmentalstainabilitydiscl mfirmage mauditfirm meffectivetaxrate, sig
```

Variable	enviro~l	mfirmage	maudit~m	meffec~e
environment~l	1.0000			
mfirmage	0.6567	1.0000		
mauditfirm	0.3115	0.2438	1.0000	

```

      |      0.0000      0.0000
meffective~e |      0.6035      0.4716      0.3767      1.0000
      |      0.0000      0.0000      0.0000

```

```

. reg environmental sustainabilitydiscl mfirmage mauditfirm meffectivetaxrate
      Source |      SS      df      MS              Number of obs =      389
-----+-----+-----+-----+-----+-----+-----+-----
      Model | 22.2847368      3      7.42824561          F( 3, 385) = 154.03
      Residual | 18.566627      385      .048225005          Prob > F      = 0.0000
-----+-----+-----+-----+-----+-----+-----+-----
      Total | 40.8513638      388      .10528702          R-squared      = 0.5455
                                          Adj R-squared = 0.5420
                                          Root MSE      = .2196
-----+-----+-----+-----+-----+-----+-----+-----
environmentalsu~l |      Coef.      Std. Err.      t      P>|t|      [95% Conf. Interval]
-----+-----+-----+-----+-----+-----+-----+-----
      mfirmage | .0072332      .0005974      12.11      0.000      .0060585      .0084078
      mauditfirm | .0750628      .0453523      1.66      0.099      -.0141064      .1642321
      meffectivetaxrate | .0082686      .0009477      8.72      0.000      .0064053      .010132
      _cons | .1670128      .0165858      10.07      0.000      .1344026      .1996229
-----+-----+-----+-----+-----+-----+-----+-----

```