Effect of Sustainability Costs Accounting on Networth of Listed Firms on Nigeria Stock Exchange

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Abstract
This study investigated effect of Sustainability Costs on Net-worth of firms' listed on Nigeria Stock Exchange. The study covers the period 2005-2015, an era of substantial deregulation of the Nigeria economy. It employed ex post facto research design and extracted cross section data from eleven (11) years annual reports of twenty (20) listed companies using non-probability sampling technique. The twenty (20) listed firms were judgmentally selected from three (3) sectors namely; Industrial goods, Consumer goods and financial services sectors based on their perceived high activities. Adopting the ordinary least squares based unbalanced panel data regression technique engaging longitudinal data set of two hundred and fourteen (214) observations, the results revealed how sustainability costs affect net worth of listed firms in Nigeria in line with a priori expectation. It found that 76.4% of the total variation on net-worth of the listed firms in Nigeria is attributable to changes in sustainability cost included in the model. Furthermore the study substantiated that the financial sector has more environmental management philosophy than the consumer goods and industrial goods sectors, while the consumer goods sector has more environmental friendly disposition than the industrial goods sector. The study therefore concludes that sustainability costs have significant effect on net worth of listed firms on Nigeria Stock exchange and recommends that the industrial and consumers goods sectors should be more receptive to sustainability issues and companies should identify sustainability activities that would impact of the society.

Key Words: *Sustainability Costs, Triple Bottom Line, Listed Firms, Net-Worth, Nigeria.*

1 Introduction

Sustainability accounting is predicated on necessity for firms to prepare and communicate their social and environmental actions to stakeholders on their annual reports. It provides evidence that firms integrate ethical values into their business model to preserve the environment with a view to benefit the present generation without jeopardizing future generation. It is the aspect of accounting where businesses give attention to the quality of the environment and social activities other than financial gains.

Jones, Ihendinihu and Azubike (2017) posited that the performance of firms that would guarantee long term stability and enhance its value amongst other factors is subject to the quality of the environment in which it operates. The dynamism in the modern business environment has placed more responsibility on firms to improve the value chain and balance the interest of all stakeholders.

Firms that recognize the need to balance the interest of all stakeholders would place themselves in vantage position to enhance business activities and performance so as to create a far-reaching and long lasting positive impact on the environment. The need to balance the interest of

different stakeholders and to strategically position itself would necessitate firms to build in the attendant cost into their overall cost structure. Firms therefore need to build-in environmental related issues as a strategic measure into their corporate philosophy. Nnamani, Onyekwelu and Ugwu (2017) noted that firms that seek to integrate social and environmental activities and stakeholders into business decision making process are viewed to be socially responsible.
The influence of globalization, adoption of International Financial Reporting Standards (IFRS) and the Global Reporting Initiative (GRI) have made the reporting of sustainability activities by firms more expedient. This is because sustainability accounting reporting is capable of enhancing corporate reputation, image and consequently guarantee competitive advantage.
Horne and Dhamija (2012) postulate that a business unit does not operate in a vacuum rather it is an integral part of the society and it exerts a lot of influence upon its environment and at the same time is dependent upon the society for survival and growth and therefore must understand and fulfill the expectations of the society.

Chartered Institute of Bankers of Nigeria (2009) opined that businesses can ensure sustainable growth and shareholders' wealth maximization through market oriented and responsible behavior and they seek better ways to contribute towards sustainable and long term business success rather than simply seeking short term goals and objectives.
The expenditure on such sustainability activities is capable of reducing the bottom line of firms engaged in the practice; however it would foster the relationship between the firm and the society in which it operates and boost trust and confidence and therefore enhance the firm's reputation, in the long run influence the share price and value of the firm.
The vital questions now are; would expenditure on sustainability guarantee long term stability and enhance value of firms listed on Nigeria Stock Exchange? The study has implications for shareholders, management of listed firms, employees, potential investors, communities, government/ policy makers, researchers, broader society and the economy.

2. Review of Related Literature

2.1. Conceptual Framework

2.1.1. Concept of sustainability

Chartered Institute of Bankers Nigeria (2009) posits that social responsibilities by firms are intentional practices to link sustainability actions into their corporate philosophy and activities by doing the extra through initiation of actions that will positively impact on host communities, the environment and the society.
The European Commission (2016) refers to sustainability as voluntary actions by companies beyond what is stipulated by government regulations to accomplish sustainability goals in the course of their activities.

The above implies that when companies integrate sustainability friendly behavior in their business strategies and operations, it would guarantee stability in business and provide competitive edge that would strengthen their relationship with the society and enhance corporate performance and in the long run the firms' value.
Brusseau (2016) posits that social responsibility or sustainability consist of two meanings. First that it is a general concept regarding the actions of firms that emphasizes both responsibilities to make wealth and that of interacting ethically with the surrounding community.
Second, that it is a specific idea of the responsibility to make profit and also relating with wider questions of community welfare.

Adeneye and Ahmed (2015) opined that social responsibility defines the capability of a firm to be socially answerable to the growth and development of the environment it operates. This

denotes that sustainability or social obligations from a firm are those actions that would advance the external environment where it carries on business.
The idea of sustainability is centered on the notion that firms cannot separate themselves from the broader society as economic entities operating in the environment. The concept encourages firms to be accountable to varied set of stakeholders rather than just shareholders and have concern for environmental protection, employees' welfare, the community and the broader society in a sustainable manner (International Institute for Sustainable Development, 2013).
Crowder (2000) noted that social or sustainability accounting is the practice of providing report on a firm's economic action that emphasize the need for such firm to identify socially relevant behavior, determine those to whom it is responsible for its' social actions and advance suitable measures and reporting techniques.

Gray, Owen and Maunders (1987) refer to social accounting as the practice where companies communicate the social responsibility and environmental effects of their profitable activities to specific stakeholders that have interest in the business. This implies that sustainability costs that are not incorporated in the conventional global accounting practices are communicated quantitatively. The essence of sustainability accounting is to engender peaceful co-operation, enduring mutual co-existence and long term growth and survival.

2.1.2. Principles of sustainability accounting
Sustainability accounting was built on the need for companies to report on their corporate sustainability behavior with a view to render their stewardship to various stakeholders.
Sustainability accounting focuses on the collection, preparation, presentation and communication of information associated to a company's interface with its natural environment as well as the cost structure on sustainability performance. The idea behind the concept is that companies' impact on the environment both positively and negatively and should therefore account for those actions as part of their standard accounting practices (Leyira, Uwaoma & Olagunju, 2011).

Ifurueze, Lyndon and Bingilar (2013) posited that social or sustainability accounting have been extended to include; research and development, staff development, design of product to enhance sustainability, recycling of waste, disassembly and process design to ease the impact of activities on the environment.
There are five main aspects any company should observe to integrate the principles of sustainability accounting in its business model. These aspects are:

2.1.2.1. Ethical Approach
This is the necessity for a company to carry out its operations in an ethical manner and with integrity (Institute of Chartered Accountants of Nigeria, 2014). This connotes that companies should establish code of practices that incorporates recognized ethical behavior as part of their core values and expect employees to comply with the ethical guidelines in the code.

2.1.2.2Utilitarian Approach
This approach hinges on the premise that organizations should consider the consequence of every alternative decision on all stakeholders and choose the alternative which provides optimal satisfaction for the majority of people. This approach emphases that organization should, in making decisions, give consideration to those decisions that would offer potential benefits to greater number of persons over the risks to a few. Organizations should show concern on the risk-benefit balance in producing their products and services (Daft, 2008). This

approach does not suggest that risk is synonymous to deleterious harm as organizations would not possibly engage in such.

2.1.2.3. Individualism Approach

This approach suggests that organizations decisions and acts are moral when their actions boost their best long term benefits (Daft, 2008). The promotion of acts that produces best long term interest can only come from honesty and integrity. Businesses that engage in short cuts for immediate gains are likely to encounter challenges from the society.

2.1.2.3 Moral- Right Approach

This approach recognizes that every individual in a society has fundamental rights and freedom that cannot be deprived because of the decision of others. Organizations should therefore take decisions with respect to recognizing the fundamental human rights and liberties. Daft (2008) postulates that organizations should consider six moral-rights during decision making: right of free consent, right to privacy, right to freedom of conscience, right to free speech, right to due process and right to life and safety.

2.1.2.4 Justice Approach

Daft (2008) posited that moral decisions by companies should be in line with established principles of equity, fairness and impartiality. He noted that management of companies should carry out and enforce decisions based on distributive, procedural and compensatory justice while dealing with individuals.

2.1.3 Net Assets Book Value or Net Worth

Net assets book value is a means to determine the value of a firm that is based on the net of its total assets and total liabilities. It is calculated as total assets less total liabilities. It is also known as net worth or shareholders' equity of a company (Olowe, 2009).

2.2. Theoretical Framework

Sustainability accounting has related theoretical framework but this study anchored on the triple bottom line theory.

2.2.1. The Triple Bottom Line Theory

This theory implies that corporate leaders should tabulate performance results not only in monetary terms of profit generation but also on sustainability activities. The theory further connotes that while presenting results on financial profits, sustainability report must be reported separately and independent from each other.

It also states that businesses should obtain sustainable results on the three areas. This implies that organizations should sustain the long term maintenance of balance economically, socially and environmentally.

2.2.1.1 Economic sustainability

This model implies that businesses should prefer long term financial stability over more risky short term anticipated huge profits. According to the triple bottom line theory, big businesses have a responsibility to create business plans that allow for stable and sustained action. Sustainability as a model implies that valued corporate plans are not about immediate or short term enormous profits; however, they should avoid actions that would result in catastrophic losses.

2.2.1.2. Social sustainability

This connotes that firms should consider the need to balance the lives of people and the way they live as former carry out their activities. This is because as the imbalance of the society grows, the rich will continue to even become richer while the poor becomes poorer and more in number and in process the likelihood that society will collapse will ensue and in anger, it may cause rebellion. This proposes that opportunities and wealth should be spread to greater number of people so as to avoid a vicious cycle to enable businesses to be stable over the long term.

This theory indicates that firms should entrench a culture of human respect in their actions both in the work environment, remunerations and superior-subordinate relationships. The employee deserves to be treated with dignity.

2.2.1.3. Environmental sustainability

This is derived from the assertion that natural resources are limited and they deteriorate considerably. Therefore it should be preserved in a manner that would make the next generation to enjoy the same quality of life that is presently experienced. Preservation of the resources therefore becomes tremendously important (Brusseau, 2016).

Firms should conserve the environment voluntarily but not as a result of compulsion under laws. The model emphasis that these actions are obligatory as protection of a habitable environment is within the responsibility of businesses under the triple bottom line theory.

2.3. Empirical Review

The field of sustainability cost on corporate performance and or value of firms have been assessed by different researchers. Several views had been opined based on empirical testing arriving at different results with the adoption of varying data and data analytical techniques. A greater proportion on this field of study had stressed on social responsibility disclosures or costs on financial performance of firms. Some of the handy empirical studies from such researchers are reviewed herein with a view to achieving the objective of this study.

Jones *et.al* (2017) investigated effect of social responsibility costs accounting on value of quoted firms in Nigeria. The study employed an *ex post facto* research design and extracted longitudinal data from annual reports of twenty (20) companies from 2005 to 2015 purposively selected from three sectors categorized on Nigerian Stock Exchange. Using variables such expenditure on education, health, social and environmental issues and net assets book value, the study engaged the ordinary least squares based unbalanced panel regression technique to estimate the variables using 67 observations. They established that social and environmental costs have significant effect on value of quoted firms in Nigeria. The study also established that each of the sectors' social and environmental costs have significant effect on values of quoted firms in Nigeria. They also claimed that the financial sector made more expenditure on social and environmental issues than the consumer goods and industrial goods sectors, while the consumer goods sector in turn made more expenditure than the industrial goods sector. The study therefore recommended that companies should endeavor to identify and invest in relevant social and environmental areas that would create an impact on the generality of the society.

Masoud and Halaseh (2017) studied relationship between corporate social responsibility (CSR) and company performance in Jordan. Data were purposively employed from cross section of 107 Jordanian companies listed on the Amman Stock Exchange (ASE) from 2002 to 2011. The study used corporate social responsibility index variables such as employee relation, environmental, community, product quality and governance which were all adopted as independent variables. Company size, company age, leverage and company risk (beta) were

used as control variables. Company performance proxies used in the study were accounting based and market based ratios. The accounting based ratios include return on assets, return on equity, return on capital employed and net income to sales ratio while the market performance based ratios were earnings per share, price-earnings ratio and price to book ratio, all used as separate dependent variables.

Panel least squares regression was used to analyze the variables. They claimed that the result of the fixed effect established that corporate social responsibility has positive relationship with accounting based performance ratios of return on assets, return on equity and return on capital employed but not significant. They also found that there is positive but not significant relationship between CSR and market based performance ratios of earnings per share, price-earnings ratio and price to book value of the firms. They stated that the result of random effect regression recognized negative relationship between CSR and some accounting and market based performance criteria specifically return on assets, net income to sales, price-earnings ratio and earnings per share of the firms. They therefore suggested that Jordanian firms will increase their profitability if their assets base expands.
Though this study used Jordanian firms listed in the ASE, it would serve as a basis of comparison except that the study was anchored on performance as the dependent variables and the variance in the independent variables.

Adeneye and Ahmed (2015) evaluated corporate social responsibility (CSR) and company performance in UK. The study used 500 firms operating in the UK as its sample size and engaged descriptive research design. Corporate social responsibility was measured by the CSR index while the performance proxies adopted were market to book value, company size and return on capital employed. The CSR index variables were employed as the explanatory variables while market to book value, company size taken as total assets and return on capital employed were each assumed as the dependent variable.

The data analytical tools used were descriptive statistic, correlation and regression. Their major findings were that there is significant positive relationship between corporate social responsibility and market to book value. They also claimed that corporate social responsibility has positive significant relationship with return on capital employed but no significant relationship between company size and corporate social responsibility was established. The study therefore concluded that CSR has significant relationship with company performance.
Akinlo and Iredele (2014) examined impact of corporate environmental disclosure and market value of quoted companies in Nigeria. The study used secondary data, purposively selected based on availability of environmental information disclosures, obtained from various annual reports and financial statements of fifty companies listed in the Nigeria Stock Exchange during the period 2003-2011.

The study used environmental pollution and control (EPC), energy policies (EP). Material recycling and conservation of resources (Biodiversity), Waste management (WM). Award received for installing environmental system (AWR), environmental research and development (ERD), compliance with environmental laws and regulations (CEL), as proxies for Corporate Environmental Disclosures (CED) and used the independent variable while firms size (total assets) as extraneous variable. Tobin's Q -Market value was used as the dependent variable.
The following equation was adopted as market value (Tobin's Q) =

$$\frac{\text{Market Value + Total Liabilities.}}{\text{Total assets}}$$

They claimed Energy policy (ENP) impact on Biodiversity (BIO), Award Received for installing Environmental Management System (AWR) have an insignificant positive impact on Market Value with the exception of Environmental Research and Development cost (ERD). The study also claimed that Environmental pollution and control policy (EPC), Waste Management Cost (WSM), and Cost of compliance with environmental Laws (CEL) have negative impact on Market Value.

Bassey, Effiok, and Eton (2013) investigated impact of environmental accounting and reporting on organizational performance of selected oil and gas companies in Niger Delta region of Nigeria. The study employed survey research design and also used secondary data and engaged probability sampling technique using the random and stratified techniques.
The methods of conducting the data analysis were descriptive statistics and Pearson's product moment correlation method.
They claimed that environmental costs was found to have satisfactory relationship with firm's profitability and noted that the environmentally suitable firms will significantly disclose environmental related information in financial statements and reports. They recommended that firms should adopt a uniform method of reporting and disclosed environmental issues for the purpose of control and measurement of performance.
The study investigated impact on environmental accounting on performance of oil and gas firms but only analyze relationship between the variables rather than the impact. Therefore it failed to address the subject adequately.

Ifurueze *et.al* (2013) investigated impact of environmental cost on corporate performance: A study of oil companies in Niger Delta States of Nigeria adopted a combination of community development costs, waste management costs and employee health and safety costs jointly as proxies for environmental costs and return on assets as proxy for corporate performance. The various costs elements served as the independent variables while the return on assets was used as the dependent variable to proxy corporate performance in the model. Multiple regression was used as the data estimation technique to analyze the variables in the model.
They claimed that community development cost has statistical significant and negative relationship with corporate performance and that waste management cost has statistical significant and negative relationship with corporate performance. In addition, they found that employee health and safety cost has positive and significant relationship with corporate performance of the firms and overall, 96% of the total variable in corporate performance is explained by the environmental costs variables included in the model. They recommended that oil companies in the region should develop articulated environmental costing system so as to guarantee a conflict free corporate atmosphere needed by managers and workers for maximum productivity and improve corporate performance.

Fodio, Abu-Abdissamad and Oba (2013) investigated corporate social responsibility and firm value of Nigerian financial services sector using 35 firms listed in the Nigeria Stock Exchange (NSE) as their sample size to achieve the objective of the study. They claimed that the choice of adopting the financial service sector is borne from their apprehension that the sector has less concern about sustainability issues than the non-financial sector as the former do not obviously impact on the environment harmfully. Their work utilized secondary data extracted from the Nigeria Stock Exchange Fact Book and annual reports of firms in the financial service sector for the period 2004 to 2008. The study used environmental performance, human resource management and community development as the independent variables and introduced four control variables namely; firm size, growth, leverage and dividend payment and the Tobin's Q (TQ) which reflects the quotient of market value to the replacement cost of the assets was

adopted as the dependent variable. The study employed the least squares regression technique to analyze the variables collected.

They claimed that the least squares regression results showed that the sector classification and earnings in previous years significantly affect the firm's CSR score positively without necessarily affecting value. The test statistics indicate that both variables appropriately address the reverse causality pattern and that the value of firm and total CSR score tend to be mutually supporting. The study concluded that social responsibility is not detrimental to the welfare of the firm's shareholders.

3. Methodology

3.1. Research Design

The study adopted *ex post* research design as the data used is already in existence and cannot be manipulated.

3.2. Method of Data Collection

The study extracted secondary data from cross section of 20 (twenty) listed firms using non- probability sampling technique based on availability of data. The selected listed firms were taken from 3 sectors namely the Industrial goods, Consumer goods and Financial services sectors and found to be very active in sustainability issues. The data covers the period 2005 to 2015, a period of considerable liberalization and competitiveness.

From the industrial goods sector, 7 listed firms were selected namely; Ashaka Cement plc, Beta Glass plc, Berger Paints Nigeria plc, Chemical and Allied Products (CAP) plc, Cutix Nigeria plc, Larfarge Wapco plc and Vita foam plc. Eight (8) listed firms were also purposively selected from the Consumer goods sector namely; Cadbury plc, Flour Mills plc, Guinness Nigeria plc, International Breweries plc, Nestle Nigeria plc, Nigeria Breweries plc, Unilever Nigeria plc and 7up Nigeria plc.

The paper further purposively selected 5 banks from the financial services which were consistently active in sustainability issues namely; Guaranty Trust Bank plc, Sterling Bank plc, Union Bank Nigeria plc, Wema Bank plc and Zenith Bank plc.

The variables extracted were sustainability costs items involving expenditure on social and environmental issues stated in each firm's directors report.

3.3. Data Estimation Techniques

The ordinary least squares based panel data regression data estimation technique was employed consequent on the longitudinal nature of the data extracted. This study engaged unbalanced panel because each of the cross section companies observed have different number of observations and at the same time, it is a short panel because the number of companies (cross sectional data) are greater than the number of time period (Gujarati, 2013).

3.3.1 Fixed effect regression

This is a method of estimating a pooled regression whereby it states the values of the dependent and independent variables for each sector as deviations from their individual mean values. This regression method also involves regression of the variables with dummies and coefficients. It helps in establishing the effect of the cross section data in respect of comparing the sectors (Gujarati 2013).

3.3.2 Random effect regression

This is a test to confirm whether the panel regression done was consistent. This is also called the error component model (ECM). It is an additional regression to ascertain the level of

relationship between variables in a panel. Here the intercept value is expressed as $\beta_{0i} = \beta_0 + e_i$. This implies that the individual differences in the intercept values of each firm are reflected in the error term (Gujarati 2013).

3.3.3 Hausman's test regression

This is a validity test to discriminate between the fixed and random effect regression. The chi square was used to determine the choice of the preference. If the probability of the chi square is 5% or less the null hypothesis is rejected and the fixed effect favoured, otherwise the random effect is selected (Gujarati 2013)

3.4. Model Specification and operational Definition of Variables

The model specification was based on triple bottom line theory and empirical reviews. Specifically, the study adapted the social and environmental aspect of the triple bottom line theory and empirical evidences of *Jones et.al.* (2017), Masoud & Halaseh (2017) and Akinlo & Iredele (2014) but made modifications.

Consequently, the functional forms of the model are;

$LOGNW = f\ (LOGSC)$

$LOGNW_{it} = \beta_0 + \beta_1 LOGSC_{it} + e_{it}$

Where;

NW = Net-worth of listed firms and the dependent variable.

SC = Sustainability costs. It is the independent variable made up of the totality of sustainability costs which include expenditure on health, education, social and environmental activities of the selected listed firms.

β_0 = Intercept term. It provides the average effect of net worth of listed firms when there is absence of sustainability costs in the model.

β_1= Slope coefficient which explains the change in the average effect of net worth per unit change in sustainability costs in the model.

e = It represents the residual term of all the other sustainability costs that affect net worth not included in the model. The error term follows normal distribution with mean zero and constant variance σ^2 (Gujarati, 2013). Sweeney, Williams and Anderson (2006) stated that it accounts for the variability in the dependent variable that cannot be explained by the linear effect of the independent variables in the model.

i = Cross section of companies

t = Time period of data

f = Function

LOG = Logged variables based on different magnitude in values.

4. Results and Discussion

4.1 Analysis on Sustainability Costs on Net worth of Listed Firms

Table 1: Panel Unit Root Test

Variable	T-Stat	P-value	Order of Integration
LOGNW	-4.349913	0.0005	1(0)
LOGSC	-9.286039	0.0000	1(0)

Source: Transformed Firms Longitudinal Data using Eviews version 9

The panel unit root test conducted revealed that the variables are integrated at level.

The study conducted pooled, fixed effect, random effect and Hausman test regression to establish the relationship between sustainability cots and net worth of the listed firms studied.

The results of the pooled, fixed and random effect regression are shown on table 2. The results indicated that the pooled and random effect though with consistent F statistic has very low adjusted R squared. The result of the Hausman test as shown on table 3 was conducted to select between the fixed and random effect.

Table 2: Regression of Sustainability Costs and Net Worth of Selected Listed Firms

	Pooled	Fixed	Random
C	5.537	6.614	6.538
	(0.243)	(0.188)	(0.234)
LOGSC	0.376	0.117	0.136
R^2	0.170	0.786	0.043
Adj R^2	0.166	0.764	0.038
DW	0.357	0.912	0.810
F-stat	43.433***	35.430***	9.457***
No of Observations	214	214	214

Source: Researcher's computation using data extracted from annual reports with Eviews version 9

Table 3: Hausman's Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.643968	1	0.0312

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOGSC	0.116652	0.136290	0.000083	0.0312

Cross-section random effects test equation:
Dependent Variable: LOGNW
Method: Panel Least Squares
Date: 02/14/17 Time: 09:31
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.613859	0.188433	35.09932	0.0000
LOGSC	0.116652	0.044883	2.599009	0.0101

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.785938	Mean dependent var	7.098169
Adjusted R-squared	0.763756	S.D. dependent var	0.842100
S.E. of regression	0.409303	Akaike info criterion	1.144252
Sum squared resid	32.33302	Schwarz criterion	1.474558
Log likelihood	-101.4349	Hannan-Quinn criter.	1.277725
F-statistic	35.43048	Durbin-Watson stat	0.912429
Prob(F-statistic)	0.000000		

Source: Computed by researcher with Eviews version 9 using data extracted from annual reports.

The Hausman test has Chi-square estimate of 4.644 with probability value of 0.0312 which is significant at 5% level of significance. The differences between the fixed and random effect is also significant. We therefore reject the null hypothesis and conclude the fixed effect regression is preferred. Thus, the fixed effect pooled with dummies and coefficients were regressed.

4.2 Analysis of Fixed Effect pooled with Dummies and Coefficients

As a result of the Hausman test which confirms selection of fixed effect, the study conducted regression of fixed effect pooled with dummy variables and coefficients.

Table 4: Fixed Effect Pooled with Dummy Variable

Dependent Variable: LOGNW
Method: Panel EGLS (Cross-section random effects)
Date: 02/14/17 Time: 09:31
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.059414	0.255661	23.70093	0.0000
LOGSC	0.138639	0.043668	3.174888	0.0017
DUM2	0.546288	0.227303	2.403352	0.0171
DUM3	0.962851	0.254181	3.788046	0.0002

Effects Specification		
	S.D.	Rho
Cross-section random	0.519172	0.6152
Idiosyncratic random	0.410560	0.3848

Weighted Statistics			
R-squared	0.107927	Mean dependent var	1.667693
Adjusted R-squared	0.095183	S.D. dependent var	0.438233
S.E. of regression	0.411814	Sum squared resid	35.61408

F-statistic	8.468873	Durbin-Watson stat	0.839545
Prob(F-statistic)	0.000025		

Unweighted Statistics			
R-squared	0.404456	Mean dependent var	7.098169
Sum squared resid	89.95420	Durbin-Watson stat	0.427582

Source: Computed by researcher with Eviews version 9 using data extracted from annual reports.

The regression includes the consumer goods and financial services sectors as dummies represented by DUM 2 and DUM 3 respectively. The industrial goods sector was adopted as the benchmark in order not to fall into the dummy variable trap.

Table 5: Fixed Effect Pooled with Coefficients

Dependent Variable: LOGNW
Method: Panel Least Squares
Date: 02/14/17 Time: 09:33
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214
LOGNW =
C(1)+C(2)*LOGSC+C(3)*DUM2+C(4)*DUM3

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	5.477779	0.201475	27.18835	0.0000
C(2)	0.269626	0.048603	5.547546	0.0000
C(3)	0.537734	0.103764	5.182280	0.0000
C(4)	1.125266	0.113060	9.952781	0.0000

R-squared	0.436384	Mean dependent var	7.098169
Adjusted R-squared	0.428333	S.D. dependent var	0.842100
S.E. of regression	0.636701	Akaike info criterion	1.953482
Sum squared resid	85.13154	Schwarz criterion	2.016397
Log likelihood	-205.0226	Hannan-Quinn criter.	1.978905
F-statistic	54.19810	Durbin-Watson stat	0.478277
Prob(F-statistic)	0.000000		

Source: Computed by researcher with Eviews version 9 using data extracted from annual reports.

The coefficients of the explanatory variables from C (2) to C (4) are independently significant with zero probability. The result reveals that sustainability costs from the sectors selected have statistical significance on their respective net worth but the rate at which they participate vary from sector to sector. The functional definition of coefficients C(1), C(2),C(3) and C(4) represent the industrial sector, sustainability costs, consumer goods and the financial sectors respectively.

4.4 Analysis on Wald Test

Table 6: Wald Test

Wald Test:
Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	49.61986	(2, 210)	0.0000
Chi-square	99.23973	2	0.0000

Null Hypothesis: C(3)=C(4)=0
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	0.537734	0.103764
C(4)	1.125266	0.113060

Restrictions are linear in coefficients.

Source: Computed by researcher with Eviews version 9 using data extracted from annual reports.

The researcher subjected the inclusion of the dummies to a validity test, the Wald test, to confirm their joint influence on the model as indicated in table 4.5. From the test statistic, the F statistic of 49.61986 at k=2 and n=210 is significant at probability of 0.0000. The chi-square value of 99.23973 is also significant with probability of 0.0000. Since the test statistic is significant, we conclude that the dummies collectively have influence on the model and the restrictions are linear in coefficients.

4.4 Test of Hypothesis

H_0: Sustainability costs accounting has no significant effect on net worth of listed firms in Nigeria.

To test the hypothesis that:

$H_0 = \beta_1 = 0$ (i.e. all slope coefficients are simultaneously equal to zero)

$H_1 = \beta_1 \neq 0$ (i.e. not all slope coefficients are simultaneously equal to zero)

We used the F statistic of the fixed effect regression to test the hypothesis in line with confirmation given by the Hausman test result. The F statistic coefficient of 35.43 has probability value of 0.000 which is sufficiently low. This implies that the F statistic is well specified. We therefore reject the null hypothesis and conclude that there is significant effect of sustainability costs on net worth of listed firms in Nigeria.

Therefore, from the hypothesis tested, the study found that sustainability costs have significant effect on net worth of listed firms in Nigeria which conforms to a priori expectation. The result corroborates earlier works of Jones *et al.* (2017), Adeneye and Ahmed (2015) and Akinlo and Iredele (2014).

4.5 Discussion on Findings

In view of the Hausman test result which favored the fixed effect regression, it implies that 76.4% of the total variation on net worth of the listed firms studied is attributable to changes in sustainability costs reported. It further confirms that sustainability costs have positive

significant relationship with net worth of the selected firms. This suggests direct relationship between sustainability costs and net worth.
The result of tables 4 and 5 reveals coefficients that are consistent. The result implies that the sustainability costs of each sector studied has positive significant relationship with their individual net worth.

The industrial sector as the benchmark is compared to other sectors. The coefficient of 5.478 represents how the industrial sector participates on sustainability issues and its effect on net worth as a sector. The sector's involvement in sustainability activities has positive significant effect on net worth. The coefficient of 0.2696 which is positive denotes that all the sectors participation on sustainability issues has positive significant effect on net worth independently. The coefficient 0.538 is the difference of how the consumer goods sector invests in sustainability matters more than that of the industrial goods sector while the coefficient of 1.125 denotes the rate at which the financial services sector invests on sustainability issues more than that of the industrial goods sector.

This implies that the actual coefficients of the consumer goods and financial sector are 6.0156 and 6.603 respectively. It connotes that the financial sector is more receptive to sustainability costs than the industrial and consumer goods sector while the consumer goods sector approaches investments in social and environment issues better than the industrial goods sector though industrial sector also engage on sustainability matters significantly. This infers that the consumer goods sector carry out sustainability activities by 9.8% more than the industrial goods sector whereas, the financial services sector expended more on sustainability issues by 20.5% more than the industrial goods sectors.

Ostensibly, it could be due to differences in management philosophy, nature of competition specific to industry and the type of business. The financial services sector unarguably is the most controlled and competitive sector in Nigeria. They are perceived to have direct relationship with the society than the other sectors studied. This could account for the essence of their involvement in sustainability issues in order to sustain a mutual beneficial relationship. Expectedly, the consumer goods sector also expended more on sustainability issues than the industrial which could be related to their relationship with society.
From the findings, the study infers that the involvement in sustainability issues by firms has direct relationship with the level of competition, sustenance of existing mutual relationship with the society and type of industry. These factors can influence a positive management philosophy on sustainability.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the result of the fixed effect pooled with dummies and coefficients which provided plausible findings with 76.4% adjusted R squared and the high F statistic, the model used is well specified. The study established that each of the three sectors purposively selected in view of their perceived sustainability activities and availability of data independently made expenditure on sustainability activities that had positive significant effect on their net worth.
However, the financial sector made sustainability expenditure more than the consumer and industrial goods sector while the consumer goods sector made investments on sustainability activities more than that done by the industrial sector. It was observed that the reason could be due to management philosophy on concern for people and the environment occasioned by the level of competition and nature of business. The study therefore concludes that sustainability costs accounting have significant effect on net-worth of listed firms in Nigeria.

5.2. Recommendations

The findings of this research have several implications for companies, government and various stakeholders. Based on the findings, the following recommendations are made;

1. Companies should endeavor to identify relevant areas that would create an impact on the generality of the society. Such investments should not only be those that impact on their business in the short run but also in the long term in a manner that would positively affect their value.
2. The industrial and consumer goods sectors should be more receptive to sustainability issues based on the nature of their operations.
3. The financial sector should improve on their present sustainability activities in view of the huge profits. .

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APPENDIX

Dependent Variable: LOGNW
Method: Panel Least Squares
Date: 02/14/17 Time: 09:29
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.537100	0.242634	22.82078	0.0000
LOGSC	0.376004	0.057054	6.590363	0.0000

R-squared	0.170036	Mean dependent var	7.098169
Adjusted R-squared	0.166121	S.D. dependent var	0.842100
S.E. of regression	0.768980	Akaike info criterion	2.321800
Sum squared resid	125.3622	Schwarz criterion	2.353257
Log likelihood	-246.4325	Hannan-Quinn criter.	2.334511
F-statistic	43.43288	Durbin-Watson stat	0.357041
Prob(F-statistic)	0.000000		

Dependent Variable: LOGNW
Method: Panel Least Squares
Date: 02/14/17 Time: 09:30
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.613859	0.188433	35.09932	0.0000
LOGSC	0.116652	0.044883	2.599009	0.0101

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.785938	Mean dependent var	7.098169
Adjusted R-squared	0.763756	S.D. dependent var	0.842100
S.E. of regression	0.409303	Akaike info criterion	1.144252
Sum squared resid	32.33302	Schwarz criterion	1.474558
Log likelihood	-101.4349	Hannan-Quinn criter.	1.277725
F-statistic	35.43048	Durbin-Watson stat	0.912429
Prob(F-statistic)	0.000000		

Dependent Variable: LOGNW
Method: Panel EGLS (Cross-section random effects)
Date: 02/14/17 Time: 09:30
Sample: 2005 2015
Periods included: 11
Cross-sections included: 20
Total panel (unbalanced) observations: 214
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.538447	0.233924	27.95120	0.0000
LOGSC	0.136290	0.043949	3.101114	0.0022

	Effects Specification	
	S.D.	Rho
Cross-section random	0.643472	0.7119
Idiosyncratic random	0.409303	0.2881

Weighted Statistics			
R-squared	0.042706	Mean dependent var	1.354722
Adjusted R-squared	0.038190	S.D. dependent var	0.424583
S.E. of regression	0.412738	Sum squared resid	36.11479
F-statistic	9.457473	Durbin-Watson stat	0.810110
Prob(F-statistic)	0.002380		

Unweighted Statistics			
R-squared	0.100873	Mean dependent var	7.098169
Sum squared resid	135.8090	Durbin-Watson stat	0.277162