International Journal of Engineering and Information Systems (IJEAIS)
ISSN: 2643-640X
Vol. 8 Issue 10 October - 2024, Pages: 110-119

Corporate Environmental Accounting Practices Components And Firm Financial Performance: Evidence From Breweries In Nigeria

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Abstracts: *This study focused on corporate environmental financial accounting CEFA, corporate environmental cost accounting CECA, and corporate environmental management accounting CEMA: as components of corporate environmental accounting practices and financial performance, (return on capital employed) ROCE from breweries hazards in Nigeria. This study aimed to provide factual data to propel corporate behavioural change that will reduce environmental hazards in Nigeria. The population of the study included all the quoted breweries in Nigeria Exchange Group, whose financial statements were found necessary from (2012-2022) financial years. A purposive sampling technique selected nine (9), out of the listed twelve (12) breweries. The research methods adapted expo- facto research designs; and by this, secondary data was sourced from the firms' published annual statements for eleven (11) years. The statistical tools analyses applied: Descriptive Statistics, Pearson Correlation and Panel Regressions. The findings show that: CECA and CEMA are positive and significant on ROCE; while CEFA is negative and significant on ROCE of breweries for the periods. Recommendations are that environmental accounting practices reporting of CECA and CEMA enhances the quality of decision-making as shown in their impacts on ROCE, and thus should be improved; also, firms are encouraged to establish proper environmental accounting practices for attaining a sustainability reporting. The study contributes to the existing body of knowledge, based on the expansive literatures for academia; the modernized study model, and the specific study findings that impact on ROCE in Nigeria. Implications of this study to practitioners in Nigeria and elsewhere; can be seen that this study focused only on breweries' environmental hazards, and not in all firms' environmental hazards in Nigeria.*

Keywords: Corporate; Environmental; Accounting; Management; Financial Performance.

Introduction

Background of the Study

The world exists and its environment is a precious gift to humanity, and this are to be admired, sustained, and likewise develop its features by improving its natural appearance ad infinitum. Any hazards done to the environment defaces its value and subsequently affects man's existence. According to (Bassey, Sunday and Okon, (2013) it (is a rich heritage handed over to us by previous generations), and needs to be sustained for the future generations. All the developmental activities of man ranging from family, sole trading, corporate and several other business functions have been carried out within the earth's environment. These varied functions of man generate wastes and disposals forming called "waste" that result to environmental pollutions, hazards which ultimately requires "disposals" that needs proper waste and disposals management. Literature has shown that firms' activities within the environment where they operate have been causing enormous and alarming pile of wastes that has culminated to environmental pollutions and causes hazards to humanity, (Pramanil, Shiland & Das, 2007). It seems that there are more concerns as regards to waste pollutions, resources depletion, resources scarcity, environmental degradation caused by firms' daily operations and has resulted to depletion of the ozone layer and creation of imbalance among the environmental systems (Beredugo and Mefor, 2012), that might affects the eco systems as well. Within the early centuries, much attention were not paid to the business functions and its interactions with the environmental and the resultant waste, pollutions, management, accounting, costing, managements and its effects on eco systems and firms'' financial performance. The world's awareness of the environmental quality came up between the fifties and sixties of the 19th century's in some developed countries. There came up a conference in Rome that had a theme according to (Shiland, 2005), with a theme "Limit to Growth" that prompted a "worldwide debate of economic growth at the expense of natural environment" this was followed with two organised international conference within 1968 and 1972. The discussions revolved on issues like "global environment and suggested corrective action" and creation of awareness to government, firms and even individuals to the problems of environment pollutions concerns globally, (Touche, 1996). Thus this agrees with the assertions of Ihenyen, and Ikegima, (2022) that environmental "degradation" affects all and sundry, currently and generations to come.

In Nigeria as well, several laws have been enacted to curb environmental issues such as: Environmental Protection Agency EPA of 1988; Harmful waste Special Criminal Provision Act HWSCPA, 1998, that regulates illegal dumping of waste; National Environmental Standards Regulation Enforcement Agency, NESREA, Act, 2007, meant to assist in environmental protection, planning, prevention and control of pollution; Environmental Impact Assessment EIA, Act, 2004, that ensures that a particular firm or industry complies in control of the hazards of their operations as it interacts with the environment and also, the Environmental Guidelines and Standards for Petroleum Industry in Nigeria EGSPIN, 2002.

The awareness of environmental problems as regards corporate activity has continued until this day, to ensure that corporations are not only adjudicated on the basis of their financial gains, but more-so on their interactions with the environmental daily operations. In other words, the overall performance of firms' products and services can also be judged through its interactions with the complexity of the operating environment (Gotherstrom, 2012). However, Bachmann, Carneiro and Espejo, (2013) asserted that it is part of the "comprehensive approach to ensure good corporate governance that includes transparency in its societal activities".

Several studies centered on environmental sustainability disclosure such as, (Porter & LInde, 1995; Berry & Rondinelli, 1998; Charkson, Lic, Richardson & Vasvari, 2011 and Malarvivhi & Matta, 2015); and some specific study of environmental accounting and financial performance such as; Ilelaboye, Charles Segun and Alade, Muyiwa (2022; Ihenyen & Atagboro, (2022; Folajimi., Adetounaminat, Tunjitrimisu & Adebayo, 2020; Ihenyen, & Ikegima, Azibaolanari, 2022; Taygashinova, & Akhmetova, 2019; Beer, & Friend (2006); focused on cost only like (Uzoh, 2022); some on, strategy, uncertainty, and commitment such as (Latan, Jabbour, de Sousa, Wamba & Shahbaz, 2018) and some on activity management (Phan, Baird & Su, 2018) and another on environmental cost accounting and performance by (Hamzah, 2020). None of these prior studies of environmental accounting EVA tried a composite study of: Corporate environmental financial accounting CEFA; Corporate environmental cost accounting CECA and Corporate environmental management accounting CEMA which this work tends to fill this gap. These three aspects of accounting have been deemed core in accounting study of any corporate in the field of accounting disclosure and corporate financial performance. Hence,, the introduction of the theme of this present study as: Composite study of "Interactions of Corporate Environmental: Financial Accounting CEFA; Costing Accounting CECA and Managements Accounting CEMA on Corporate Financial Performance CFP" of selected breweries firms in Nigeria.

The major focus of this study on Interaction of Corporate Environmental: Financial Accounting CEFA; Costing Accounting CECA and Managements Accounting CEMA on Corporate Financial Performance CFP" of selected breweries firms in Nigeria; While other main focus includes Composite Interactions of CEFA; CECA and CEMA on CFP" of selected firms in Nigeria.

Research Questions

The research questions streamline with the objectives as how does CEFA; CECA and CEMA interacts with CFP of selected firms in Nigeria.

Hypotheses of the Study

The posited hypotheses of the study states as follows: Interactions of CEFA, CECA and CEMA is not significant on CFP in Nigeria.

Literature Review

Conceptual Review

Environmental Accounting EA

Environmental accounting EA, conversely, is also called "green accounting" (Cho & Patten 2013; Marissa 2019; Ihenyen & Emmanuel Atagboro, 2022), has been defined as "the collection and aggregation of information for decision makers, both internal (e.g. managers) and external (investors, regulators, lenders, and the broader public) to the company" for external and external uses. IFAC, (2005) defined it as " management of environmental and economic performance via management accounting systems and practices that focus on both physical information on the flow of energy, water, materials, and wastes, as well as monetary information on related costs, earnings and savings." Graff, Reiskin, White and Bidwell (1998) agreed that this term is "a broad-based" such that includes all environmental costs information among all the accounting practices. As had earlier explained EPA (1995) and others guide EA to ensure that firms keep to them and incorporates full environmental management system cost information that ensures that there is economic and environmental benefits from it. EA also, measures all the environmental related costs and relates the all the effects of same on the county's environment and their national economy, (Okafor, 2018). In the same vein, Uzoh, (2022) asserted that EA assists and enhances "a sustainable future" of corporations. EA can also include EMA environmental management accounting (Qian, & Chen, 2020; Asiri, Khan, & Kend, 2020) and main part of the recent accounting development because it includes "traditional accounting disclosure with "ecological" disclosure as well (Lu & Li, 2020; Tzouvanas et al. 2020). In corporate financial reports, they are required to have a supplementary disclosure of corporate environmental information (Lu & Li 2020; Pien, 2020; Tzouvanas, Kizys, Chatziantoniou, & Sagitova, 2020)) and thus shows it as part of an increases corporate supplementary information disclosed found in corporate yearly reports (Iatridis, 2013), The disclosure of EA reports is meant to be influenced by two major factors such as internal and external factors as found in (Macagnan & Fontana, 2013; Giannarakis et al., 2019; Welbeck, Owusu, Bekoe, & Kusi, (2017).). Among the external factors includes: media, Odoemelam and Okafor 2018); government (Welbeck et al. 2017); and consumer interest Liu, and Anbumozhi, (2009) which assist EA information report. The internal factors are: However government enacts various laws as found in Nigeria to compel firms disclose the effects of their interaction with the environment to information users. Some of the found environmental "external factors" comprises: "regulative pressure" (Qian, Hörisch & Schaltegger, (2018)., "competitive mechanism" (Giannarakis, Andronikidis, & Sariannidis, (2019)); and those "non-government organizations" pressures (Welbeck et al. 2017), as well compel corporate "environmental information" disclosure. Folajimi, Adetounaminat, Tunjitrimisu and Adebayo (2020) found that "environmental accounting influences the share value". Oyedokun, Egberioyinemi and Tonademukaila (2019) reported that "environmental accounting disclosures" are all positive and significant on firm value.

Corporate Environmental Financial Accounting, CEFA

Uzo, (2022) disclosed that "environmental accounting is an important issue in the present day financial reporting". CEFA ensures that accounting is incorporated among environmental transactions reporting and such issues that impact the corporate financial position and performance. Several enacted Laws and regulations that enhance and promotes better eco systems have indeed compelled firms to disclose information that relates to their operation with environment. Some of the required information has values and results in a reasonable financial implication for firms, but some firms contrarily have not really been compared to disclose records to stakeholders. It is still evident from some financial reports that many stakeholders are yet to get relevant financial information for decision making purposes. Proper EFA matters report can possibly result in a dramatic change in a corporate financial position and drive a very long term performance of firms. Nguyen, (2019), insists that there is a global evidence, of a relative imbalance between economic development and environmental protection, because firms have started to address "sustainable development strategy". According to him "environmental accounting information assists stakeholders for making business cooperation decisions and investments, and thus the need to promote publication of environmental accounting information on behalf of "research and business" purposes. There are evidences that during negative incidents of "environmental catastrophes", firms that reports "higher social responsibilities" survives better than their counterparts or competitors, (Nguyen, 2019),. Other literatures assert that firms with more CEFA reports and social responsibility have better goodwill to avert negative attitudes than their competitors (Orlitzky & Benjamin, 2001; Magness, 2006; Chidoko & Mashavira, 2014; Khan et al., 2017; and Olaoye & Olanipekun, 2018). Social responsibility was remarked by Nguyen, (2019) that "greater loyalty from the customer can help companies absorb external shocks and give the company more time to make adjustments to its operations".

Corporate Environmental Cost Accounting, CECA

ECA is part of EMC that focuses on recognizing and classifying environmental issues and costs for better decisions making. It assists to design a typical environmental acceptable cost accounting system within firms by collecting relevant cost of materials, readdressing cost in the form of separating ECA from other overhead costs and other accounting for costs as it relate with sustainable development. Amaegbu and Onyali, (2021) explained that ECA gives companies the opportunity to properly allows assess "the impact of their activities on the environment" To them, the routine traditional costing systems has some weakness in tackling environment costs incurred, and therefore the need to develop a newer cost implementation systems that can "trace and allocate environmental costs" (Taygashinova & Akhmetova, 2018), and coordinate it with other existing cost, and environment costs (Phan et al., 2018). This has awakened cost accountants to develop and streamline costs, and report environmental cost impacts of operations. Environmental pollution has made stakeholders such as: government, media, consumers, investors, employees, financiers, non-government organizations and other interested parties to mount pressures on disclosure of CECA reporting. Hamzah, (2020) indicated firms that have practically implemented CECA and expressed that it is effective in "reusing disposable costs and bringing financial benefits through more effective resource utilization and reduction of wastes and enhance organizational performance.' Further, Hamzah, (2020) show that "environmental costs" are the main component of CECA and previous studies showed lack of "standards to define such costs". This lack of standardization unveiled complexity in defining environmental management accounting EMA in general and CECA specifically (Beer & Friend, 2006; Jasch, 2002). The Environmental Protection Agency EPA, (1995; 1996) defined environmental costs as "internal and external" costs. Internal costs comprised all the normal "conventional costs" that relates to such items as: "materials, equipment, and supplies", other "hidden environmental costs", attributable to allocating "environmental expenses to overhead cost pools". Inclusive are: "contingent, image and association costs" Concerning internal cost, Beer et al., (2005); Gale and Stokoe, 2001) expressed that "their nature are not intangible". Then, external costs components are "degradation outcome that exonerates the companies from being liable, i,e. "not legitimately responsible", which affects people, "the organizations' property and benefits that cannot be remunerated by legal systems" (EPA, 1995; Hamzah, 2020)). On the other hand, Jasch (2006) categorized the costs into "internal and external costs that relate to all costs incurred in relation to environmental damage and protection", these are: "processing costs, deterrence and environmental management, waste and emission handling, and material purchase value of non-product output". Finally Beer and Friend, (2006) asserted that to understand environmental costs into "internal or external" remains the core to determine "the scope of the costing system'. Uzoh (2022) found that "annual report of oil and gas firms in Nigeria" excludes environmental operating; while the cost of pollution prevention, environmental protection, environmental remediation, and environmental recycling are all positive on CFP. Also, Amaegbu, Onyali, nd Chidiebele, (2021) found that cost of prevention, environmental degradation, management and education are negative on financial performance; while environmental damage cost was positive and significant on performance in Nigeria. Hamzah, (2020) found that "ECA positively affected EP and FP, also ECA positively affected EP". Hosam, Maher, Henry, Barbara and Salsabila (2020) also reported an "autonomous Green Accounting costs on financial performance has a negative relationship"

Corporate Environmental Management Accounting CEMA

Environmental management accounting is part of managing the environmental impact or the extent to which company daily activities impact the environment through the application of physical data from accounting systems. The normal practicing of traditional accounting systems that its main objectives centres of financial performances are insufficient to relate environmental costs and impacts as required, (USEPA, 2000; IFAC, 2005). The definition of EMA was given by IFAC, (2005) as: "The management of environmental and economic performance via management accounting systems and practices that focus on both physical information on the flow of energy, water, materials, and wastes, as well as monetary information on related costs, earnings and savings." IFAC's view is that CEMA draws attention to physical and monetary information relating to firms transactions and environmental impacts

where the traditional accounting systems had none provisions. CEMA is part of constituent of management accounting that furnishes environmental information as regards for firm's management internal decision. According to Bennett, Rikhardsson, and Schaltegger (2013) CEMA, interacts in between "environmental accounting and management accounting" containing both "monetary and physical information" (Schaltegger, Bennett, Burritt & Jasch, 2008; Bartolomeo, Bennett, Bouma, Heydkamp, James, de Walle, &Wolters,1999 and Bennett, et al., 2013). The main focus of CEMA practices is to ensure that environmental information are made available for firms' strategic decisions with other purposes including external annual statements (Niap, 2006). Hamzah, Ahmed, Ghaleb and Faten (2018) found that "environmental strategy ES positively affects the level of EMA usage and a positive relationship between EMA and the organizational performance"

Corporate Financial Performance CFP and Environmental Accounting

CFP is a total check of corporate financial statement position within a time frame to figure out whether the firm is profitable or not in the terms of revenue generation, using some analytical indications such as\; "sales growth, profitability, return on investment, return on sales and return on equity), share price, earnings per share, and return on capital employed., (Astrin, Mohd Hassan, Jumadil, Mohd Yusoff, Zikri &Abdul, 2021). The measure of CFP indicates the extent to which shareholders' value has appreciated within the reporting period, when compared with the value at beginning, after analyses of all the components of financial statements and stock market prices with the appropriate ratios, (Baraza, 2014). Some metrics that can be used to measure various CFP includes profit after tax PAT, return on assets ROA, return on equity (ROE), return on capital employed ROCE, earnings per share EPs and other acceptable market value metrics (Yenesew, 2014, 2020, Astrin, et al., 2021). The greater the Return on Equity results, the better the company's performance. The general rating has been that when a firm's Debt to Equity Ratio is higher, indicates high gearing of the firm and much dependency on external debts (creditors) and pays higher interest costs burden. But a firm with good liquidity ratios shows the ability to meet every up current obligation demands and such make firm to look financially healthy in attracting outside investors (Mindra & Erawati, 2014 and Atrin, et al., 2021). Some prior reviewed studies show that CFP impacts financial performance: (Earnhart & Lizal 2010; Iwata & Okada, 2011 & Ong, Teh, Ang, 2014). Further the specific findings of, Earnhart & Lizal 2010; Iwata & Okada 2011; Ong et al. 2014, Al-Tuwaijri, Christensen & Hughes, 2014; Konar & Cohen, 2012, Konar & Cohen 2001 show positive relationship of CEA and CFP. Iwata and Okada, (2001) reported that waste emissions affects CFP is positively; while "waste emissions" are negative on dirty firms. Others show that "poor environmental performance" is negative and significant on publicly traded firms' intangible asset (Konar & Cohen 2001). More-so, Qian (2012); Filbeck and Gorman (2004); Rassier and Earnhart (2010); Sarkis and Cordeiro (2001), and Wagner et al. (2002) show there is "negative relationship". This study specifically employed return on capital employed ROCE, (Ilelaboye & Alade, 2022). They asserted that ROCE shows the interactions between profit and firms' capital employed within any financial period as measures of earning power firms' employed net asset. According to Chukwuma (2015) it shows a generated percentage returns using firms' employed total funds that financed their activities within any financial year. According to Ilelaboye and Alade, (2022), ROCE shows "the efficiency and profitability" of any firms' capital investment. Sengottuvel (2018), indicates it should more than firms' borrowing rate.

Theoretical Framework

This study employs stakeholders' theory which Miller (1994) opines is fundamental between political and economic forces in society interrelationship; while Blomquist and Deegan (2000) are of the view the theory emphasizes society, politics and economics are indivisible, to separated from social and environmental problems. Stakeholder theory covers corporate management and its ethics as they affect: "employees, suppliers, local communities, creditors, environments", corporate social responsibility, market economy, and social contract theory" etc.

Among many of the major functions of this theory are that firm interacts with several actors within the environment and shows how the corporate managers treat the firm stakeholders, should be fundamental to the management and all of the management business decisions. Ian Mitroff, (1983) propounded morals, ethics and maximum values for stakeholders. Donaldson and Preston, (1995) show that these actors of stakeholders includes "investors, political groups customers, communities, employer's trade association, suppliers, government" and others etc.; while Freedman and Reed (1983) sees it as "group or individual" who assist firms to realize their objectives.

Research Methods

Research Design, Population and Sampling Techniques

This study applied expo- facto research design that makes use of already available financial statements of the firms reported for the selected periods concerned.

Population of the Study

The population of the study comprised all the eleven, (11) Breweries Companies quoted on the Nigerian Stock Exchange, Group Ltd for the 2022 annual year

Sampling Techniques

The sampling size of nine (9) companies was determined using purposive sampling techniques that focused on the firms that have the complete information in their annual reports required for this research purposes within the chosen periods, (2012-2022) as found in 2023.

Method of Data Analysis

The analyses used Panel data method of regression which is a combination of cross-section data and time-series data which is measured at various times (Erthur & Musolesi, 2017). It also applied the G4 Global Reporting Initiative GRI that guidelines firms for proper disclosure of information concerning, economic, environmental, and social aspects for proper measurement of corporate sustainability reporting. Data collection for the independent variables applied content which according to Ugwu, (2020) is an "analysis which is a systematic classification of process of coding and identifying items or patterns that involves subject interpretation of text data", (Hsiey & Sharon, 2005). The Methods of data analyses adapted the use of statistical tools of descriptive, Correlation and Panel Multiple Regression.

Variables and their Measurement

Variables	Symbol	Metrics Measurement	Apriori Expectation	Variable Applied Before as in	Theoretical Background
Dependent: Corporate Financial Performance	ROCE	Return on capital employed in percentage is computed as profit after tax divided Total equity and Total liabilities	(+)	Ugwu, (2020)	stakeholders' theory which Miller (1994
Corporate Environmental Financial Accounting	CEFA	Corporate Environmental Accounting,, CEVA measured by total cost of Waste Management Cost, Community Development Cost and Employee Health Safety Cost (GRI)	(+)	Ihenyen, Joel Confidence1 (PhD) & Ikegima, Azibaolanari Comfort (2022).	stakeholders' theory which Miller (1994
Corporate Environmental Cost Accounting	CECA	Use best quantitative judgment to measures utilization of sum consumed in environmental costs. (GRI)	(+)	Hosam, Maher, Henry, Barbara and Salsabila (2020)	stakeholders' theory which Miller (1994
Corporate Environmental Management Accounting	CEMA	Used G4 aspects of Global Reporting Initiative (GRI**) and** measured by eco-efficiency energy	(+)	Yobi, Inten and Syamsurijal (2020); Ugwu, (2020)	stakeholders' theory which Miller (1994

Sources: Author's Compilations, (2024)

Model specification

This work adapts the model of

Oyedokun, Egberioyinemi and Tonademukaila, (2019)

ROIij= α0 +α1 (EPCij) + α2(EDCij) + α3(EMECij) + μ..... Model i

Here the study modernizes the above model to suit this study as follows:

ROCEit = βo + β_1CEFAit + β_2 CECAit + β_3CEMAit + μit……Model ii

Where the definitions are as follows:

ROCE is Return on Capital Employed of the firms, i in period it; βo = Constant term (intercept) of the study model; β_1- β_3 = Coefficients of Corporate Environmental Accounting Practices; μit = Component of unobserved error term of the firms, i in period *t;* CEFAit = Corporate Environmental Financial Accounting, *i* in period *t;* CECAit = Corporate Environmental Cost Accounting, *i* in period *t;* CEMAit = Corporate Environmental Management Accounting, *i* in period *t; while t=11 years, (2012-2022).*

Data Presentation, Analysis, Interpretation, Discussions and Summary of Findings, Contribution and Recommendations

Descriptive Statistics Analysis

Table: 1 Descriptive Statistics

	ROCE	CEFA	CECA	CEMA
Mean	0.881386	0.079835	0.032638	148.4081
Median	1.000000	0.060073	0.072855	23.46000
Maximum	1.000000	0.584184	5.287219	1326.600
Minimum	0.000000	-0.172648	-7.212432	-293.0000
Std. Dev.	0.318856	0.132094	1.729271	282.2266
Skewness	-0.400678	0.423041	-0.055860	0.350592

Kurtosis	3.312747	3.321296	3.12214	2.526178
Jarque-Bera	161.7329	159.8608	349.2541	195.2058
Probability	0.000000	0.000000	0.000000	0.000000
Sum	79.34333	7.026339	2.825750	12318.32
Sum Sq. Dev.	8.394507	1.311811	266.2056	7514884.
Observations	99	99	99	99

**** Where CEFA = Corporate Environmental Financial Accounting: CECA = Corporate Environmental Cost Accounting; CEMA = Corporate Environmental Management Accounting.***

Source: Author's Computation, (2024)

The descriptive statistics result above shows that ROCE has a mean value of 0.881 showing about 88% disclosure in environmental activities. The mean values of CEFA, CECA and CEMA are 0.0798, 0.03263 and 148.408 respectively.

Here, the study above also check for the measures of Skewness and kurtosis of dispersion of the data moving from the center towards the tails of distributions, whether the data follows the normal distribution as established by (D'agostino, Belanger, & D'Agostino Jr, 1990). Further consideration of both the dependent variable ROCE and each of the independent variables; the skewness for ROCE is -0.400678 which shows negative in the distribution; while the kurtosis are approximately three (3), thus the distribution appears to be leptokurtic. On the other hand, all the independent variables values of skewness indicate that the data is positive and thereby skewed showing a symmetrical distribution for all. Moreover, the coefficient of Kurtosis is above three (3) which is the normal; thus the kurtosis are equal or approximately (3) which is an indication that the distribution is possibly "platykurtic". The Jacque-Bera for all the variables shows that the data meets a normality test.

Correlation Analysis

Table: 2 Correlation Result

	ROCE	CEFA	CECA	CEMA
ROCE	1.000000			
CEFA	0.128657	1.000000		
CECA	0.008333	0.181499	1.000000	
CEMA	-0.119628	0.127918	0.034220	1.000000

**** Where CEFA = Corporate Environmental Financial Accounting: CECA = Corporate Environmental Cost Accounting; CEMA = Corporate Environmental Management Accounting.***

Source: Author's Computation, (2024)

The correlation table above shows that the dependent variables has a positive relationship with CEFA and CECA, but they are not perfectly correlated to distort the result; while it has a negative relationship with CEMA. Finally, all the independent variables has positive correlation with respectively, but none of the variables is perfectly related to distort the result of the hypotheses testing.

Panel Least Regression Analyses

Table: 3 Panel Least Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-883961	714351	-1.23743	0.2472
CEFA	-299633	120835	-2.47967	0.0350
CECA	746877	334256	2.53361	0.0320
CEMA	735387	156414	4.70154	0.0011

R-squared	0.83716	Mean dependent var	159571
Adjusted R-squared	0.76767	S.D. dependent var	168955
S.E. of regression	814364	Akaike info criterion	34.9358
Sum squared resid	4.38793	Schwarz criterion	1.08661
Log likelihood	-12.6112	Hannan-Quinn criter.	814364
F-statistic	11.7591	Durbin-Watson stat	2.04766
Prob(F-statistic)	0.00263		

Note: Model significant @: *1%; **5%

**** Where CEFA = Corporate Environmental Financial Accounting: CECA = Corporate Environmental Cost Accounting; CEMA = Corporate Environmental Management Accounting.***

Source: Author's Computation, (2024)

The panel model above shows the values of R-Squared and Adjusted R-Squared to be: 0.83716 and 0.76767, which also means 83.72% and 76.77% respectively. This implies that the R-Squared value of 84% explained the individual systematic variations of the independent variables found in the dependent ROCE; while the balances of 26% where not explained. On the other hand, the

combinations of all the explanatory variables by Adjusted R-Squared shows 77% jointly explained the systematic variations in ROCE; while 23% variations were unexplained and possibly will be recovered by the stochastic error term included in the model.

The F- value of shows (11.7591) with a corresponding probability (0.00263) shows that the parameter estimate is significant at 5% level of significance set out by the study. The D.W statistic of (2.04766) indicates the possibility of auto-correlation if compared with the standard rule of thumb which is (2) for checking auto-correlation in regression model. Therefore any decisions taking in the hypotheses testing is considered reliable.

Hypotheses Testing and Discussion of Findings

Here, we test the posited hypotheses of the study as follows:

Ho_1: Interactions of CEFA is not significant on financial performance ROCE of Breweries in Nigeria

The regression model above shows that the value of CEFA (-299633), which is negative and has a corresponding statistical value of (0.0350). Therefore, if compared with the decision rule of the study which was set at 5% significance level, the study thus accepts the alternate hypothesis that CEFA is negative and significant on ROCE of firms in Nigeria. In other words, any unit change in CEFA has a corresponding negative impact on financial performance of breweries in Nigeria for the period under study.

In the discussions of findings on corporate environmental financial accounting and ROCE of firms, this study found that CEFA is negative and significant on ROCE of firms in Nigeria. This findings did not agree with several other studies' findings who found CEFA positive and significant; (Folajimi et al., 2020; Nguyen, 2019; Earnhart & Lizal 2010; Iwata & Okada 2011; Ong et al. 2014, Al-Tuwaijri, Christensen & Hughes, 2014; Konar & Cohen, 2012, Konar & Cohen 2001 who showed positive relationship of CEFA and CFP. More-so Qian (2012); Filbeck and Gorman (2004); Rassier and Earnhart (2010); Sarkis and Cordeiro (2001), and Wagner et al. (2002) also reported "negative relationship" in agreement with this study findings.

Ho_2: Interactions of CECA is not significant on financial performance ROCE of Breweries in Nigeria

The value of CECA seems positive with a value of (746877), with a corresponding probability value of (0.0320) and the probability value seems less than the criteria which is 5% level of significance decision rule. The study therefore rejects the null hypothesis and accepts the alternate that CECA is positive and significant on financial performance (ROCE) of breweries in Nigeria. This shows that any unit of change in the CECA brings a corresponding positive change in the ROCE of the sampled firms in Nigeria.

Corporate environmental cost accounting CECA in this study is found positive and significant on financial performance (ROCE) of breweries in Nigeria. This report agrees with the prior findings of (Uzoh, 2022 and Hamay, 2020); but disagrees with Amaegbu et al., (2021) and Hosam et al., (2020), who found it negative in contradictions.

Ho_3: Interactions of CEMA is not significant on financial performance ROCE of Breweries in Nigeria

Observing from the model above the value of CEMA is (735387), which is positive and its probability value is (0.0011), which is significant at 1% if compared with the decision rule at 5% significance level. By this, the study rejects the null hypothesis and accepts the alternate that CEMA is positive and significant on financial performance ROCE of breweries in Nigeria.

Conversely, any change in the CEMA brings an equivalent impact on the financial performance of breweries in Nigeria.

Finally, the finding of this study on corporate environmental management accounting CEMA is found positive and significant on financial performance ROCE of breweries in Nigeria. However, this agrees perfectly with the findings on similar matter by (Mamzay et al., 2018), who found positive relationship with firm returns on assets.

Summary of Findings

The summary of this study findings are as follows:

Corporate environmental financial accounting CEFA is negative and significant on ROCE of firms in Nigeria

Corporate environmental cost accounting CECA is positive and significant on financial performance (ROCE) of breweries in Nigeria.

Corporate environmental management accounting CEMA is positive and significant on financial performance ROCE of breweries in Nigeria.

Conclusions

This study centered on interactions of CEFA, CECA and CEMA as components of corporate environmental accounting practices and financial performance in Nigeria that can ensure factual data and effect corporate behavioural change and reduce environmental waste impacts in Nigeria.

The research adapted expo- facto research designs methods and applied the statistical tools of Descriptive, Pearson Correlation and Panel Regressions analyses. Findings are: that CECA and CEMA are positive and significant; while CEFA is negative and significant on financial performance of all the selected firms for the period, (2012-2022).

Recommendations

Recommendations from the study findings is that environmental accounting practices and reporting of CECA and CEMA specifically enhances the quality of decision-making as shown in their effects on ROCE, but CEFA has negative impacts as indication that proper reporting has not been achieved in Nigeria as compared to other countries elsewhere and thus firms should establish a standard for sustainability reporting.

Contribution to Knowledge

The study contributions are on the vast literatures conceptual framework; the composite environmental accounting for academia; the modernized model and specific findings on each variables of environmental accounting in Nigeria.

Suggestion for Further

Further study should be carried out on environmental accounting practices on other sectors and not on breweries in Nigeria.

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