
Environmental Conservation Cost and the Financial Stability of Business Organizations in a Competitive Market

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Abstract

Many manufacturing companies operating in Nigeria have struggled to achieve financial stability but this has become a difficult task due to complex circumstances including low capacity production, undercapitalization, lack of stakeholder legitimacy, and a complacent attitude towards the importance of environmental conservation costs. A debate in the literature has argued that adequate corporate investment towards environmental conservation and protection has been found to influence a significant level of financial stability in Nigeria. In contributing to this debate and contributing knowledge, we examined how the expenditures associated with environmental protection affected the financial stability of industrial businesses listed in Nigeria. Since secondary data for the study were taken from the yearly financial statements of the firms that were specifically chosen, it used an ex-post facto design. A total of 14 businesses were chosen from the 66 manufacturing enterprises in the population for a 16-year period beginning in 2007 and ending in 2022. For the data analysis, inferential statistics were utilised, and the external auditors' certification of the data's validity and reliability served as the basis. The study discovered that the expense of environmental protection had a considerably favourable impact on the financial stability of commercial organisations in a market that was competitive. (Adj R²=0.05, W(4,219)=23.32, p < 0.05). The study concluded that environmental conservation cost affects financial stability of business organization in a competitive market. The study recommended that Managers of manufacturing companies should prioritize investment in environmental conservation costs to enhance the financial stability of stakeholders' value.

Keywords: business organization, cash flow adequacy ratio, competitive market, energy conservation cost, environmental conservation cost, financial stability, research and development.

1. Introduction

Financial stability is the bane of manufacturing enterprises' ability to use their resources effectively and optimally, which is necessary for a more intensely competitive market environment. Incidentally, despite the potential to help millions of people escape poverty by

generating wealth for the stakeholders and contributing to the economy through job creation, Nigeria's manufacturing sector is beset by under-capitalization and a shortage of adequate financial strength that has impeded industrialization in Africa's largest country. The economy of a country depends heavily on the industrial sector. It significantly contributes to creating jobs, raising productivity, and promoting economic progress. In Nigeria, the manufacturing sector is an important one that makes a substantial contribution to the GDP through the creation of jobs, wealth, and higher tax income for the government (Adegbe et al., 2023).

The problem of financial stability of manufacturing companies in Nigeria is complex and multifaceted as the companies over the years have been struggling in a desperate move to remain afloat and gasping for air due to issues such as a lack of foreign currency, high borrowing rates, poor infrastructure, inconsistent legislation, economic and political uncertainties, and security challenges. Akindehinde et al. (2022) noted that policy inconsistencies and insincerity of the successive Nigerian government have crippled the corporate organization, but the worst hit were the manufacturing companies who had been suffocated to shutting down operations and the volatility of the market had not given the companies the opportunity to compete fairly with their competitors in the global competitive market.

The problem of financial stability of the manufacturing companies listed in Nigeria had been compounded by low production of installed capacity as a result of unprecedented persistent infrastructural deficits and major among them is the absence of reliable power supply (Akpan&Uwakmfonabasi, 2021; Alami, 2020). Anekwe et al. (2019) argued that the absence of dependable infrastructure is now one of the main challenges facing Nigerian manufacturing. Companies find it challenging to transport goods and raw materials within the nation and abroad due to power shortages, inadequate road systems, and restricted access to ports and airports. Costs rise as a result, as do lead times, and competition declines. Although the government has made investments in rail, the nation still lacks horizontal rail. In the south as well as the north, there is no one track that connects the west and the east.

Asuquo et al. (2019) posited that the volatility and weak foreign exchange policies, interest rate oscillations and government weak regulations and legislation are frequently unfavourable to the growth of certain industries, creating financial stability problems for the manufacturing sector in Nigeria. This presents a challenge to the sector since, as a result of unfavourable circumstances, most agreements cannot be fulfilled. The industry cannot function effectively as a result. According to Alami (2020), the problem of power fluctuation in Nigeria has caused severe worries regarding the development and efficient operation of enterprises in Nigeria. It is highly expensive for businesses and raises the cost of manufacturing, which is not ideal for expanding enterprises. It has also been seen as a crucial industry in the country's effort to diversify away from its reliance on oil. It can help a nation raise its overall competitiveness, decrease its dependency on imports, and improve its trade balance (Atanda et al., 2021; Chikwendu et al., 2019).

Financial stability among the manufacturing companies listed in Nigeria has been attributed to a lack of cash flow adequacy. Ezeokafor and Amahalu (2019) noted that the difficulty of getting financing is another significant issue. Many Nigerian manufacturers have trouble getting the

funding they require to modernize buildings, buy new equipment, or increase their business operations. Due to perceived dangers, banks are reluctant to lend to the industrial sector, which contributes to the high cost of borrowing. The volatility of the foreign exchange market, the challenge of obtaining foreign exchange, and currency depreciation are all closely connected. Think about the following to grasp the severe effects of this problem: One of the oldest still operating fast-moving consumer goods (FMCG) businesses, Unilever, is scaling back operations in Nigeria, which might spell the end for certain formerly well-known brands including Sunlight, Omo detergents, Closeup paste, Lifebuoy soap Vaseline jelly, and Dove, or Knorr (Aguguom et al., 2022).

The issue of financial stability has ripple effects and impacts on effective resource optimality. Obiora et al. (2022) reported that as a consequence of the shortage of funding capacities. Ogbo et al. (2017; Obiora, 2022) argued that firms have cited the persistent cash shortage, exorbitant exchange rates for the US dollar, and ongoing devaluation of the naira as justifications for their choice. It is not a contest to predict that jobs have been lost or will be lost. Unilever Nigeria has added its name to the increasing list of businesses that are ceasing operations entirely in Nigeria. Additionally in limited supply is skilled personnel, with many businesses finding it difficult to locate employees with the required technical knowledge as the majority of Nigerian unemployable youths had been on the increase due passive attitude of the government toward providing quality education in Nigeria. Ogbonna et al. (2020) noted Part of this may be attributed to the country's inadequate educational system, which does not provide young people with the abilities necessary to excel in the contemporary workplace. As a result, a lot of firms are forced to use pricey foreign workers, which drives up their expenses even more.

Etim et al. (2020; Ezeagba et al. (2017) reported that statistics have indicated some manufacturing companies that had shut down operations in Nigeria, the operations of Peak Aluminium, Phonenix, and Wise Machine Industries have ended. In a previous study supported by the International Centre for Investigative Reporting, the firms also included Louis Carter Limited, Sky Aluminium, Grief, Errand Products, Technoflex, Gorgeous Metal, and Mother's Pride, as well as the Industrial and Foam Equipment, Deli Foods, and Universal Rubber. Errand Products, Universal Rubber, and Technoflex. These companies may be found all throughout Nigeria, especially in the states of Anambra, Lagos, Ota, Agbara, Jos, Bauchi, Kano, and Nnewi. However, the extent to which environmental conservation affects the financial stability of manufacturing companies has been a divisive and contentious global debate in the literature (Emeka-Nwokeji& Benjamin, 2020; Eze et al., 2016). Environmental conservation costs do have an impact on the financial stability of manufacturing companies listed in Nigeria.

Whereas some studies have opined that environmental conservation costs do not have an influence on commanding the financial stability of the manufacturing companies, Aggarwal (2013) revealed that environmental conservation costs had an insignificant the effect on financial performance of the organization, while Al-Amin et al. (2019) found environmental protection costs exerted a negative influence on firm value. However, other studies have produced contradictory findings. For example, Etim et al. (2020) and Emeka-Nwokeji and Benjamin. (2020) reported that environmental conservation costs of environmental and safety costs, energy

conservation costs, and environmental protection costs have individually and collectively had a negative significant effect on manufacturing companies' financial stability, suggesting that financial constraints are closely related to a company's capacity to exert energy.

Environmental conservation costs in this context refer to costs incurred inside a particular nation in order to comply with national regulations. Costs associated with environmental protection are broken down into two categories: expenses associated with providing services and materials for environmental needs, as well as fees based on law. These costs are paid in accordance with real emissions into any environmental medium (air, water, or soil), as well as environmental load waste (Antoun et al., 2018). The expenditures associated with ensuring that a company's operations do not harm the environment or that any such harm is repaired. Environmental costs come in many different forms, and because they are sometimes masked by overhead, it can be challenging to detect them. As national rules get stricter and penalties or fines become more severe, measuring environmental expenses has become a significant challenge for many businesses. It is helpful to divide environmental expenses into the following four groups the price of environmental evaluation. These are the expenses incurred by a company's monitoring efforts for environmental consequences. Costs associated with product inspection and contamination testing are two examples (Al-Jaifi, 2020; Khan, 2019).

Costs of environmental prevention. These are the expenses incurred by actions taken to stop the development of garbage that could harm the environment. Examples include the price of employee training, product recycling, and conducting environmental research (Njul, 2018). Internal environmental failure costs. These are the expenses incurred when garbage and toxins are generated by an organization but are not released into the environment. Examples include managing pollution equipment and handling hazardous waste. The expenses associated with environmental failures. These are the expenses a business would suffer if it released garbage into the environment. Costs of cleaning up oil spills or a contaminated river are a couple of examples. A business may also experience fines, other penalties, or decreased sales if it purchases. In solving the problem of financial stability, the manufacturing companies in Nigeria have not witnessed much empirical evidence relating environmental conservation costs to impact on financial stability (Ekwueme et al., 2013; Chikwendu et al., 2019).

Gaps in previous research on the expenses of environmental conservation, issues with the literature's financial stability, and a lack of emphasis on environmental preservation among Nigerian industrial enterprises all contributed to the study's impetus and motivation. The researchers have noted a paucity of literature exploring the expenses associated with environmental protection and its consequences for the financial health of industrial enterprises listed in Nigeria. While several research (Aguguom et al., 2022; Adegbe et al., 2023; Anekwe et al., 2019) have noted outstanding environmental conservation compliance in advanced economies. The contrary is the case in developing economies, and Nigeria's level of environmental compliance is obviously on the decline considering the underlying realities of consistent and uncontrolled water and air pollution, and the increasing number of cancer and pollution-related diseases on the increase in Nigeria. In contributing to knowledge and bridging gaps in the literature, this current study hypothesized thus:

Research Hypothesis (H₀₁): Environmental conservation cost does not significantly affect the financial stability of manufacturing companies listed in Nigeria.

The remainder of the paper was structured as follows: Section 2 reported the results of the literature study that took the conceptual review, theoretical review, and empirical review into account. The study's methodology and data were presented in section 3, and section 4's results and analysis were taken into account. Section 5 presented a conclusion, suggestions, and knowledge addition.

2. Literature Review

2.1 Conceptual Review

Financial stability: Financial stability is a complex issue in corporate organizations and different definitions of financial stability have been advanced in the literature. However, the absence of financial distress in corporate organizations. In the Nigerian manufacturing industry, it is routine that financial distress is a regular occurrence as the companies have witnessed a shortage of capital inadequacies and the possibility of obtaining sufficient loan facilities from the banks and efforts geared to actualize this could mean that the companies would be working for the banks considering stringent and high-interest rates been a demand by the banks (Atanda et al., 2021; Alami, 2020). Ezejiolor and Amahalu (2019); Chikwendu et al. (2019) documented that financial stability entails a system where the manufacturing companies are able to function optimally in relation to adequate returns and capitalization effective financial management both in short-term and long-run capital requirements and operating in an environment of effective economic stability capable of taming the tides of exchange volatility, volatility of returns and inherent risks. Policies to protect the Nigerian manufacturing companies were not effectively implemented, leaving the companies to struggle to access foreign currency to import essential materials, machinery and equipment due to unfriendly disparity between Nigerian Naira and the Us Dollar, leaving the manufacturing companies struggling to produce products and do not have access to a competitive market with their contemporaries in the industry in other nations.

Cash Flow Adequacy Ratio: The cash flow adequacy ratio is one of the ratios that provide desiring investors with the level of financial stability and financial health condition of corporate organizations. Boshnak (2021) opined that the cash flow adequacy ratio considers in perspective, the solvency and capital adequacy status of companies. The ability of a company to command persistent cash flow from its operations is imperative in meeting capital expenditures as well as operating overheads. The significance of sustainable cash inflow in a manufacturing outfit is a signal of financial stability. According to Dal Maso et al. (2020), the cash flow adequacy ratio is a good measure of financial stability since it considers the earnings of the companies and at the same time takes into consideration the tax and fixed interest obligations as well as the capital expenditures of the companies lagged against the debts obligations current and potential future maturities in right perspectives.

Environmental Conservation Cost: In this instance, manufacturing companies all over the world are closely linked with environmental pollution possibilities and are required to pragmatically devise policies to effectively manage wastes and ensure effective environmental

protection control measures in meeting international best practices in environmental conservation and protection (Ghardallou, 2022; Kaur & Lodhia, 2018). To ensure effective control measures and implementation, there are obvious cost implications. To this end, environmental conservation costs are those related costs associated with the preservation and maintenance of nature from pollution and degradation, air purity and water preservation from harm capable of causing injuries and harm to human beings, animals and trees (Norhasimah et al., 2015; Ondotimi & Ayesha, 2020). Efforts to reduce air and water pollution, and cost to implement policies to prevent or reduce emissions capable of reducing the natural state of the environment in relation to air, water, soil and forest are comprehensively categorized in this group.

Water, Air quality and waste disposals Cost: Costs related to efforts and corporate policies implementations of the management to achieve best practices in wastes management and control measures to pollution of water and enhance air purity and quality is significant in achieving stability in the polity of good atmosphere conducive to smooth manufacturing operations and by extension financial stability of the manufacturing companies (Peng & Isa, 2020). In the Nigerian case, there is outright disregard for environmental protection of water and air pollution as non-compliance of regulatory policies bold not complied by the manufacturing companies with all impunities, the manufacturing companies are fully aware that there are weak institutions, compromising policy enforcements in the hands of highly corrupt officers saddled with the responsibility to ensure environmental protection compliance (Whetman, 2018; Hassan & Lahyani, 2020).

Environmental and Safety Promotion Cost: Environmental and safety promotion are complementary as companies are expected to make investments to promote environmental protection and a safe environment in the workplace for the staff and customers (Obida et al., 2019). Costs associated with the implementation of policies and regulatory requirements to promote a green environment and safety in all respect are categorized in this respect. The safety environment is essentially a good signal of the importance companies attach to their staff welfare and promotion of human nature by ensuring that the production factors and the associated hazards are safe and no injuries to the worker.

Research and Development Cost: Research and development are fragmental parts of searching for new ways to improve working conditions and protect the environment from pollution and damage. Companies desiring to ensure environmental conservation would seek new innovations and technological models to achieve adequate environmental conservation in the manufacturing value chain. Some studies by Lotto (2019); Anekwe et al. (2019) have revealed that research and development costs had impacted financial stability, suggesting that effective research and development, training and research efforts have significantly effects.

2.2 Theoretical Review

Institutional Theory: The study considered institutional theory as proposed by John Mayer and Brian Rowan in 1970 (Antoun et al., 2018). This served as the underpinning theory of the study as the financial stability of companies largely depends on strong institutions and compliance to constituted authorities when there are strong institutions to enforce compliance. Institutional theory is concerned with the working ability of every facet of an institution that would allow

smooth operations of the organization and protection of human rights as well as contractual rights. Some assumptions of the institutional theory tend to exhibit similar characteristics. According to Ahmad (2017), institutions are the outcome of their constituted governance structure, the true reflection of instituted rules and social order, social conduct, and the ability to enforce their implementations. The institutional theory further assumes that groups and corporate bodies conforming to these constituted rules are given legitimacy and accorded recognition of their services.

The legitimacy of a corporate organization is significant as the going concern of the organization largely depends on the acceptance of its products and services. Hence, the survival of an organization is essentially important for its continuous existence. Akben-Selcuk (2019) noted that the institutional theory assumes that the effectiveness or otherwise of an institution depends on the corporate governance and those in charge of its affairs. Some supporters of the institutional theory believe that other studies by Arayssi et al. (2016) have widely documented in the literature the significance of strong institutions to achieve organizational goals. The effectiveness of every government and the quality of corporate governance largely depends on the effectiveness of institutions in enforcing laws, rules and regulations in the society as well as in the organization. Antoun et al. (2018) backed the institutional theory and pointed out that a lot of companies in the United States adopted this theory from 1880 to 1935, to support their organizational survival and performances (Arayssi et al., (2016)

Stakeholder Theory: The idea that shareholders, managers, and other stakeholders have a relationship that is interconnected and supports business value was backed by stakeholder theory. The burden of guaranteeing proper corporate performance and company value fell on the management. Consistent profitability drives firm value since it is a reflection of the organization's strong strategic character and performance culture, which are supported by a capable management team and work to advance the company's fortunes. In addition, in reinforcing sustainability reporting, the credibility of financial reporting and signalling theories were considered appropriate since there is a direct association and correlation between the credibility of financial reporting theory and signalling theory on sustainability reporting. The credibility of financial reporting gives impetus to the quality and sustainable good image of the banks. Banks known for good and reliable financial reporting are accorded good recognition as their reported financial statements would have the ability to add economic value to decision-makers. Banks are liable to enjoy acceptance and legitimacy from the stakeholders and the general public when they know that the reported financial statements of the banks are of high quality.

2.3 Empirical Review

Environmental disclosure procedures for reporting on the organisational performance of a few listed industrial companies in Nigeria were reviewed by Oguon and Ekpulu (2020). Data were gathered from the firms' financial filings using an expo facto research approach. Pooled regression analysis was used to analyse panel data, and the results showed that the practises of environmental disclosure benefited the firms' reputations and perceptions of their products among stakeholders. The study also discovered that firm size and environmental disclosure reporting had a favourable impact on the organisational performance of the chosen industrial

enterprises listed in Nigeria. When compared to the outcome of Nasir et al. (2014)'s study, Oguaoon and Ekpulu (2020) have a result that is comparable. The results of the regression analysis showed that the firm performance of the firms chosen and tested for the study was positively impacted by sustainability reporting. On the other hand, there is no overlap between Oguaoon and Ekpulu's (2020) research and Obida et al. (2019) study. According to the study, environmental disclosure has a detrimental impact on market returns, which has an adverse influence on investors' investment choices in the region under examination.

Emeka-Nwokeji and Benjamin (2020) used Nigeria as a case study to examine the effects of sustainability disclosure from the perspectives of economic, social, and governance (ESG) on firm growth and market value of chosen enterprises in emerging nations. In order to analyse the data, a study design known as *expo facto* was utilised. Data were derived from published and audited financial accounts. The results of the regression study revealed a favourable relationship between environmental sustainability disclosure and the market value of the chosen enterprises. The results of the study by Emeka-Nwokeji and Benjamin (2020) are consistent with those of Eze et al. (2016). The combined regression analysis revealed that environmental and sustainability reporting positively impacted the financial success of the enterprises under examination. In contrast, the research conducted by Emeka-Nwokeji and Benjamin (2020) does not agree with the research conducted by Ezeagba et al. in 2017. According to the study, environmental accounting significantly and negatively affected the corporate performance of the firms.

The impact of environmental disclosure and performance variables on the price earnings ratio financial performance of a sample of Nigerian listed businesses was experimentally evaluated by Etim et al. in 2020. From the study's overall population, 10 firms were chosen as a sample size. Ten years' worth of financial statements from the chosen firms were taken into consideration. The study's methodology made use of statistical panel data, and the findings showed that environmental disclosure improved the performance of the firms. The research conducted by Etim et al. (2020) is consistent with that of Hassan & Lahyani (2020). The findings showed that environmental disclosure was successful and had a favourable influence on the performance of the chosen firms' price-earnings ratios.

From the standpoint of the effectiveness of the chosen firms' CSR initiatives, Kim and Oh (2019) looked at the impact of environmental conservation expenses on corporate asset quality. Using information from the secondary source of the financial records of the firms registered in India, the study employed an *expo-facto* research design. Based on the results of the F-statistics of joint variables, the study's statistical analysis of panel data with panel data revealed that sustainability had a positive significant impact on the corporate organisation performance of the sampled companies in India. The findings of the study by Kim and Oh (2019) did not differ from those of Kaur and Lodhia (2019). The study's findings showed that the financial performance of the Australian enterprises chosen for the study was significantly impacted by environmental conservation costs and stakeholder involvement. While Amin et al. (2019) found that environmental conservation costs had a negative and minor influence on the assets quality and

financial stability of the Islamic banks in the area analysed, Kim and Oh's analysis differs from that finding.

In Tanzania, Lotto (2019) conducted an empirical study on the potential impact of the environmental conservation cost of operational efficiency on asset quality and corporate performance. The study used an expo factor research design using secondary data from the chosen firms' financial records. Multiple regression analysis and descriptive statistics were used in the study. The study's findings showed that business performance and sustainability were inversely related. In addition, the study discovered that, based on the outcomes among Tanzanian enterprises, the expenditures associated with environmental conservation had a detrimental impact on corporate performance. This Lotto (2019) outcome is consistent with the one from Akben-Selcut (2019). The findings showed that corporate sustainability had a little impact on the Turkish banks' corporate performance. On the other side, the results for Lotto (2019) and Ezeokafor and Amahalu (2019) are not comparable. Based on a 0.05 percent threshold of significance, the analysis's findings showed that environmental conservation cost indexes had a favourable impact on company performance.

Anekwe et al. (2019) investigated the costs, effectiveness, and asset quality of environmental protection in Nigerian banks. With the use of an ex-post factor study methodology, secondary data were utilised. The information was gleaned from the annual financial records of Nigerian banks during a ten-year period. The panel data analysis showed that environmental conservation charges had a marginally favourable impact on banks' performance. Comparing the study's findings from Anekwe et al. (2019) with those from Ezeokafor and Amahalu (2019), comparable conclusions were reached. Based on a 0.05 percent threshold of significance, the analysis's findings showed that environmental conservation cost indexes had a favourable impact on company performance. In contrast, the report of Anekwe et al. (2019) is not comparable.

The impact of the internal environment on the profitability of manufacturing businesses listed in Nigeria was examined by Nwaubani (2019). The study focused on the cost of environmental conservation on return on assets as the profitability metric, employee productivity sufficiency of capital, asset quality, and board size as indicators of a social proponent. For a period of 13 years (2004-2016), secondary data were taken out of the financial statements of the selected DMBs. A panel data regression analysis was used to analyse the data, and the study's findings were inconsistent: The study discovered that board size and staff terminal perks had a negligible and minor influence on return on assets, but capital sufficiency and employee productivity had favourable effects. According to the report, restructuring manufacturing organisations should carefully implement the corporate governance monitoring function to prevent a decline in employee morale and a decline in productivity. When compared to the findings of Okolie and Igaga (2020), which showed that environmental conservation expenses had a significant beneficial impact on the financial performance of the chosen industrial enterprises listed in Nigeria, the study of Nwaubani (2019) is comparable. On the other hand, Nobanee and Ellili's (2017) result and Nwaubani's (2019) result from their study are not comparable. The study found that United Arab Emirates (UAE) enterprises' financial performance was negatively impacted by the economic, environmental, and social elements of sustainability financial reporting

3. Methodology

Research Design/Source of Data: In a market that is competitive, the study looked at how environmental conservation expenses affect the financial stability of commercial organisations. The study used an expo facto research technique, employing secondary data gathered from the yearly financial statements of industrial businesses listed in Nigeria for a period of 16 years ranging from 2007 to 2022 in order to take the issue of financial stability into consideration.

Population/Sample Size: All 66 manufacturing businesses listed on the Nigeria Exchange Group for the time period under consideration up to December 31, 2022, made up the study's population. Purposive sampling methods were used to choose industrial firms. 224 observations are made. The statutory auditors' approval of the manufacturing enterprises' yearly financial statements served as the foundation for the authenticity and dependability of the tool used.

Method of Data Analysis: The study explored inferential (multiple regression) analysis, using pooled regression analysis.

Dependent Variable: Financial Stability is surrogated using the cash flow adequacy ratio. In previous studies, financial stability has been measured using various matrices (). In this study, consistent with prior studies, we measure financial stability was measured using the cash flow adequacy ratio (CFAR). The cash flow adequacy ratio is a valuation ratio used to determine a company's financial health and solvency. It is an important tool for investors to evaluate a company's ability to meet its financial obligations. This ratio is particularly crucial for companies that have large capital expenditures or regularly distribute dividends to shareholders. To calculate the cash flow adequacy ratio, a company's cash inflows are compared to its cash outflows.

Cash Flow Adequacy Ratio (CFAR) = $\frac{\text{EBITDA} - \text{Taxes paid} - \text{Interest paid} - \text{Capital Expenditure}}{\text{Average Annual Debt Maturities Schedule over the next five years}}$

Average Annual Debt Maturities Schedule over the next five years

Independent Variable: The independent variable of environmental conservation cost was measured using four Checklist indicators of Energy Conservation Cost, Water, Air quality and waste disposals Cost, Environmental and Safety Promotion Cost, Research and Development for Environmental Friendly Products & Services Cost from the annual financial statements of the manufacturing companies selected for the study. The study employed environmental conservation cost indicators from the Global Reporting Initiatives (40).

Model Specification

$$Y_{it} = \beta_0 + \beta X_{it}$$

Functional Relationship

$$\text{CFAR}_{it} = \text{ECC, QAWC, ESPC, RDEC}$$

Model

$$CFAR_{it} = \beta_0 + \beta_1 ECC_{it} + \beta_2 WAWC_{it} + \beta_3 ESPC_{it} + \beta_4 RDEC_{it} + \mu_{it}$$

Where

CFAR = Cash flow adequacy ratio, Financial stability, ECC = Energy Conservation Cost, WAWC = Water, Air quality and waste disposals Cost, ESPC = Environmental and Safety Promotion Cost, RDEC = Research and Development for environmentally Friendly Products & Services Cost,

4. Data Analysis, Results and Discussions

4.1 Regression Results

The regression analysis of environmental conservation costs and financial stability is presented in Table 1

Table 1: Environmental Conservation Cost and Financial Stability (Cash flow adequacy ratio)

Variables	Panel-data estimation, two-step system GMM	
ECC	Coefficient	0.003
	Standard error	0.006
	T-Stat (Prob)	0.49 (0.626)
WAWC	Coefficient	68.052
	Standard error	57.029
	T-Stat (Prob)	1.19 (0.233)
ESPC	Coefficient	-21.263
	Standard error	21.136
	T-Stat (Prob)	-1.01 (0.314)
RDEC	Coefficient	2.468
	Standard error	12.581
	T-Stat (Prob)	0.20 (0.844)
CONSTANT	Coefficient	-590.938
	Standard error	1313.369
	T-Stat (Prob)	-0.45(0.653)
Observations	224	224
Wald test	chi ² (4) = 23.32 (0.000)	
Adjusted R-Squared	0.05	
AR(1)	Z = -1.00 (0.316)	
AR(2)	Z = 0.98 (0.328)	
Test of overid. Restrictions	Sargan: chi ² (252) = 286.18 (0.068)	
	Hansen: chi ² (252) = 27.21 (1.000)	
Exogeneity tests: GMM instruments for levels	Hansen: chi ² (211) = 26.12 (1.000)	
	Difference (null H = exogenous): chi ² (41)= 1.09 (1.000)	
Exogeneity tests: Individual Instruments	Hansen test excluding group: chi ² (249) = 21.99 (1.000)	
	Difference (null H = exogenous): chi ² (3) = 5.22 (0.156)	

Source: Researcher’s Computations (2023). *Note: Cash flow adequacy ratio (CFAR), Energy conservation costs indicators (ECC), Environmental and safety promotion cost indicators (ESPC), Water, Air quality and waste disposal indicators (WAWC) and Research and development for environmentally friendly products and services costs indicators (RDEC).*

$$CFAR_{it} = \beta_0 + \beta_1 ECC_{it-1} + \beta_2 WAWC_{it} + \beta_3 ESPC_{it} + \beta_4 RDEC_{it} + \epsilon_{it}$$

$$EA_{it} = -590.938 + 0.003Q_{it-1} + 68.052WAWC_{it} - 21.263ESPC_{it} + 2.468RDEC_{it}$$

$$Z\text{-test} = \begin{matrix} -0.45 & 0.49 & 1.19 & -1.01 & 0.20 \end{matrix}$$

Interpretation of Post Estimation Test

The post-estimation tests from the System General Method of Moment were used to assess the accuracy of the parameter estimates for the Model that studied the impact of environmental conservation costs on the financial stability of industrial enterprises listed in Nigeria. The ideal four tests are as follows: the first tests the first autoregressive order's serial correlation with the null hypothesis that there is no serial correlation. Second, the second autoregressive order serial correlation test with the serial correlation null. Third, the model's provided null is a suitable instrument for the Hansen test of over-identifying limitations. The final step is the Sargan test, which verifies that the variables supplied are appropriate instruments and that the model's specified values are

The null hypothesis of no-serial correlation was not rejected, and the alternative that there is a serial correlation is not accepted when the serial correlation of autoregressive of order 1 has a statistic of -1.00 and a probability value of 31.6 percent. The consecutive error terms should be correlated, and the AR(1) should be substantial, according to the SGMM. The null of serial correlation was rejected and the alternative of no serial correlation was adopted since the AR(2) with a statistic of 0.98 and a probability of 32.8% is not significant. This is consistent with the literature's recommendation that the AR(2) be serial independent. Consequently, the estimated model is lacking in

The Sargan test and the Hansen test evaluate the model's validity using probability values of (1.000) and (0.000), respectively. The Sargan test result of 286.18 with a probability value of 6.8% is statistically insignificant. The Hansen statistics of 27.21 with a probability value of 100% is larger than the selected significance threshold of 0.05, indicating the validity of the model. Accordingly, the null hypothesis of the tests asserts that over-identifying limits are valid, which means that all instruments are valid, based on the Hansen Test. Hansen's findings demonstrated the validity and applicability of each instrument in the model for estimate.

The result of the Difference-in-Hansen tests of exogeneity of instrument subsets for GMM instruments for levels is 1.09 with a probability value of 100 per cent, which is statistically insignificant. This implies that the model is dynamically complete and that the instruments are valid for the estimation. In addition, the Difference-in-Hansen tests statistic of exogeneity of instrument subsets for the individual instruments is 5.22 with a probability value of 15.6 per cent is also statistically insignificant. Thus, the null hypothesis of the Hansen test excluding this group of instruments was not rejected which implies that there is no validity for introducing additional instruments into the model. This also confirmed the exhaustiveness of the instruments in the model.

Interpretation of Results

From the results in Table 1, there is evidence that the energy conservation cost has a positive relationship with the cash flow adequacy ratio (CFAR). This implies that increases in energy conservation costs will lead to an increase in the cash flow adequacy ratio (CFAR). Thus, a 1 per cent increase in the energy conservation cost will lead to a 0.003 per cent increase in the cash flow adequacy ratio (CFAR). The results also revealed that the energy conservation cost has no significant relationship with the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria (ECC = 0.003, Z-test= 0.49, $p > 0.05$). This implies that the energy conservation cost is not a significant factor influencing changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria.

The results also show that social environmental conservation cost indicators have a positive relationship with cash flow adequacy ratio (CFAR), thus increases in social environmental conservation cost indicators will lead to an increase in cash flow adequacy ratio (CFAR), a 1 per cent increase in social environmental conservation cost will lead to 68.052 increase in cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria. The results also revealed that the Water, Air quality and waste disposal indicators have no significant relationship with the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria (WAWC = 68.052, Z-test= 1.19, $p > 0.05$). This implies that social environmental conservation cost is not a significant factor influencing changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria.

In addition, the results revealed that environmental conservation cost indicators have a negative relationship with cash flow adequacy ratio (CFAR), thus, a 1 per cent increase in environmental conservation cost will lead to a 21.263 per cent fall in cash flow adequacy ratio (CFAR). This implies that increases in environmental conservation cost indicators will lead to a decrease in the cash flow adequacy ratio (CFAR). Concerning the significance of the estimated parameter, there is evidence that environmental conservation cost has no significant relationship with the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria (ESPC = -21.263, Z-test = -1.01, $p > 0.05$). This implies that environmental conservation cost is not a significant factor influencing changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria.

The results for Research and development for environmentally friendly products and services cost indicators (RDEC) indicators suggest that there is a positive relationship with the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria, thus, a 1 per cent increase in Research and development for environmental friendly products and services costs indicators (RDEC will lead to 2.468 per cent increase in cash flow adequacy ratio (CFAR). This implies that increases in Research and development for environmentally friendly products and services cost indicators (RDEC will lead to an increase in the cash flow adequacy ratio (CFAR). Concerning the significance of the estimated coefficient, there is evidence that Water, Air quality and waste disposal indicators had no significant relationship with the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria (RDEC = 2.468, Z-test = 0.20, $p >$

0.05). This implies that Water, Air quality and waste disposal indicators are not significant factors influencing changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria.

The Adjusted R² measure the proportion of the changes in the cash flow adequacy ratio (CFAR) as a result of changes in Energy conservation costs indicators (ECC), Environmental and safety promotion cost indicators (ESPC), Water, Air quality and waste disposal indicators (WAWC) and Research and development for environmental friendly products and services costs indicators (RDEC). This explains about 5 per cent changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria, while the remaining 95 per cent were other factors explaining changes in the cash flow adequacy ratio (CFAR) of the manufacturing companies listed in Nigeria but where not captured in the model.

Discussion of Findings

In the current study, we looked at how environmental conservation costs affected the cash flow adequacy ratio (CFAR) of industrial firms with Nigerian stock exchange listings. The findings of the examination of dynamic panel data were inconsistent. Environmental sustainability indicators (ESPC) showed negative trends, but expenses for energy conservation (ECC), water, air quality, and waste disposal, as well as RDEC corporate research and development for environmentally friendly goods and services, all had positive benefits. The cash flow adequacy ratio (CFAR) of industrial businesses listed in Nigeria for the time period under study, however, was positively impacted by environmental conservation cost, according to the results of the F-statistics employing the combined explanatory variables of environmental conservation cost. This outcome is consistent with some earlier research (Amin et al., 2019; Antount et al., 2018; Antount et al., 2018; Khan, 2019; Jaouad&Lahsen, 2018; Al-Amin et al., 2018; Whetman, 2018; Najul, 2018; Ezeokafor&Amahalu, 2019; Chikwendu, 2019). On the contrary, some previous studies have documented an inverse result (Kaur &Lodhia, 2019; Asoquo et al., 2019; Ekwueme et al., 2013).

5. Conclusion, Recommendations and Contribution to Knowledge

Conclusion: In the recent study, the impact of environmental conservation expenses on the monetary stability of manufacturing businesses listed in Nigeria was investigated. Given the relevance of environmental protection and preservation, environmental conservation expenditures may have an influence on the overall performance of manufacturing businesses listed in Nigeria from the perspective of financial stability. In addressing the problem of financial stability of the manufacturing companies, the study measures financial stability using the cash flow adequacy ratio putting in perspective the undercapitalization profile and the role adequate cash flow play in the sustainable growth of manufacturing companies in Nigeria. Environmental conservation cost was measured using environmental conservation indications of energy conservation costs indicators, environmental and safety promotion cost indicators, water, air quality and waste disposal indicators, and research and development for environmentally friendly products and services cost indicators.

Regression estimation of the parameter revealed mixed results: All the variables of energy conservation costs indicators, water, air quality and waste disposal indicators, and research and

development for environmentally friendly products and services costs indicators exerted positive but insignificant effects on cash flow adequacy ratio, on the contrary, the environmental and safety promotion cost exerted a negative insignificant effect on cash flow adequacy ratio. The environmental conservation cost did, however, have a positive and substantial impact on the cash flow adequacy ratio, according to the joint statistics that included all of the explanatory factors. The study came to the conclusion that environmental conservation costs have an impact on the industrial enterprises listed in Nigeria's financial stability.

The Implication of Findings: The result of the analysis revealing negative effects and insignificant effects of the costs associated with environmental conservation implied the negative attitude of the manufacturing companies making meaningful investments geared toward environmental conservation and protection in Nigeria. This could have some implications for the Nigerian environment and the inhabitants, especially the host communities where these manufacturing companies operate. It beholds the policymakers and concerned institutions on the significance of strengthening regulatory policies and ensuring companies take responsibility to make the expected expenditure to effectively manage their wastes and conserve the environment from pollution, water contamination, air pollution and emission control in Nigeria. There are potential adverse effects on the health condition of Nigerians who consistently inhale polluted air from factories and water pollution arising from water pollution.

Recommendations: In light of the findings, the research advised manufacturing company management to review their environmental policies in order to reinforce such policies and their commitment to environmental protection. To monitor the level of environmental protection and conservation compliance in Nigeria, policymakers must make sure they perform their oversight responsibilities. In order to ensure that negligent manufacturing businesses proven to be at fault in this situation get the required punishments, host communities should be proactive in reporting contamination of their water and agriculture to the relevant authorities.

Contribution to Knowledge: While this study has made a contribution adding to the existing literature, the management, managers and directors of the manufacturing companies will find this study useful as it will enhance a clear understanding of the dynamics and implications of corporate governance being enhanced with the right attitude to environmental conservation cost among in the selected manufacturing companies listed in Nigeria. The pros and cons of environmental conservation cost compliance, the possible consequences of non-compliance and the economic value arising from environmental conservation cost compliance in the financial statement for the benefit of users are of great importance in making reliable and credible decisions.

Limitations and Suggestions for Future Studies: There were some limitations in this study. One the study considered only possible environmental conservation costs found in the financial statement of the selected manufacturing companies, as some of the financial statements were not explicitly detailed in relation to the costs incurred in environmental conservation. Two, environmental conservation costs were not segmented properly in some of the manufacturing companies' financial statements limiting the number of companies selected to a minimal number

of 15. Notwithstanding the observed limitations, the researcher was able to obtain adequate data for the study, hence the quality of the instrument was adjudged sufficient for the study. Future studies could expand the scope by including more polluting companies operating in Nigeria beyond the manufacturing companies used in this study.

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