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EFFECT OF ENVIRONMENTAL MANAGEMENT ACCOUNTING PRACTICES AND REPORTING ON ORGANISATIONAL PERFORMANCE

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Abstract

The objective of this study was to examine the effect of environmental management accounting practices on organisational performance of consumer goods firms in Nigeria. The study specifically examined the effect of environment management accounting practices on return on asset and return on equity. The study also examined the level of environmental management accounting reporting among consumer goods firms in Nigeria. The study adopted the ex-post facto research design; as the goal was not to manipulate any variable but rather to establish effect. The population comprised listed consumer goods firms and the sample restricted to a purposive sample of ten (10) firms whose annual reports were accessible for the period of 16 years from 2007-2022 which was the time scope of this study. The data were analysed using ordinary least square regression. The results showed that environmental management accounting practices has a significant effect on return on asset and a non- significant effect on return on equity. The study also found a significant difference on environmental management accounting practices reporting among consumer goods firms in Nigeria. Based on these findings, the study recommended among others that Indigenous and multinational consumer goods firms should ensure that strict policies as regards environmental accounting are adhered to, in order to enhance stable organizational performance.

Keywords: Environmental Management Accounting, Return on Asset, Return on Equity

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INTRODUCTION

Due to population growth and industrialization, the global economy has expanded quickly in the twenty-first century; at the same time, environmental degradation has become quite serious (Wu, Yang and Zhou, 2020). Managers' awareness of environmental issues has increased due to factors such resource consumption, material recycling, landfill utilization, waste disposal, changing climate, carbon emissions, and contamination of land and water (Saeidi, Othman, Saeidi and Saeidi, 2018). Furthermore, Baah, Opoku-Agyeman, Acquah, Agyabeng-Mensah, Afum, Faibil and Abdoulaye (2021) state that increasing regulatory demands and public concern are compelling corporations to broaden their corporate obligations to incorporate environmental and social considerations into all aspects of their operations.

Many stakeholders, including suppliers, governments, workers, consumers, and shareholders, are growing more and more concerned about environmental issues. As a result, many businesses are motivated to enhance their ecological impact reporting and environmental mitigation strategies in order to satisfy the demands of their investors and clients (Iredele, Tankiso and Adelowotan, 2020). Businesses have been forced to experiment with different environmental management practices as a result of these expectations, thereby bringing environmental sustainability into the field of strategic management. As it is widely understood that every operational procedure has the potential to negatively affect environmental and societal systems, Gunarathne, Lee and Hitigala-Kaluarachchilage (2021) noted that companies have lately begun to face increased concerns about the environmental and social impact of the company. Governments, corporations, the people at large, and other international organizations now have begun to embrace the idea of sustainable development. Consequently, these organizations are trying to motivate businesses to prioritize not just the environment and society but also their financial performance (Jinadu, Agbeyangi and Mamidu 2015). Consequently, the industrial companies should prioritize economic and environmental performance more. Previous research (Aigbedo, 2021; Christine, Yadiati, Afiah and Fitrijanti, 2019) claimed that a company's financial performance (FP) was its final measure of success. Taking these concerns into account, the study seeks to ascertain the effect of environmental management accounting practices and reporting on organizational performance.

Firms in any aspect of manufacturing or production in Nigeria are expected to be environmentally friendly to their host communities. These firms are expected to properly dispose their waste and not emitting them into the environment. On the contrary, these firms have a history of causing environmental problems in the areas where they operate. This may be largely due to their ever-increasing strategy to ensure profit maximization; hence they scarcely make resources available for proper waste disposal or treatment. These uncultured attitudes of discharging waste into the environment have caused great harm to the host communities in terms of loss of farm lands, contaminated water and air. it is unfortunate that despite the significant benefits that these firms from their host, the majority of these firms continue to hold the belief that any costs associated with environmental issues will often result in additional costs for them in the short term, which may also lower their effectiveness and efficiency in the long run. Therefore, the challenge of this study is to determine why the majority of these firms are still not completely environmentally friendly particularly in the communities in which they operate, the extent of their disclosures on environmental issues and the effect costs associated with environmental issues will have on the overall performance of these firms.

Objectives of The Study

The main objective of this study is to examine the effect of environmental management accounting practice and reporting on organizational performance of consumer goods firms in Nigeria. The study specifically sought to address the following specific objectives:

1. To determine the effect of environmental management accounting practice on Financial Performance measured by Return on Asset.
2. To ascertain the extent of disclosures on environmental issues in corporate annual reports of consumer goods firms in Nigeria.
3. To determine the effect of environmental management accounting on Shareholders Return using Return on Equity (ROE).

Research Hypotheses

The following hypotheses were tested in the study:

1. HO: Environmental management accounting practice does not have significant effect on return on asset consumer goods firms in Nigeria.
2. Ho: There is no significant difference in the level of corporate environmental disclosure practices among consumer goods firms in Nigeria.
3. Ho: Environmental management accounting practice does not have significant effect on the return on equity consumer goods firms in Nigeria.

2. LITERATURE REVIEW

Environmental Management Accounting

The Environmental Protection Agency in the United States of America (USA) introduced the concept of Environmental Management Accounting (EMA) in the early 1990s. Since then, organizations in over 30 countries have used EMA to address a variety of environmental management initiatives across multiple categories (Asiri, Khan and Kend, 2020). By forming a working group in 2001 that is focused on EMA practices and principles, the United Nations Division for Sustainable Development (UNDSD) helped to advance EMA (Jasch, 2006). A significant resource for EMA research and implementation, the International Federation of Accountants (IFAC) also produced an EMA advice document in 2005 (Asiri, Khan and Kend, 2020). EMA and IFAC, as well as UNDSD show that there isn't a single, accepted definition for the term EMA, but that it's an attempt to combine financial and environmental data for internal management purposes.

According to Asiri, Khan and Kend, (2020) this integration leads to management accounting procedures that are focused on the environment.

Mokhatar, Jusoh and Zulkifli (2016) noted that EMA recognizes two categories of information; monetary environmental information and physical environmental information. Monetary environmental information is produced by management accounting systems that are environmentally oriented either fully or partially designed to capture environmental costs, and it represents environmental costs for the organization's environmental activities in currencies (such as USD or Naira). Physical environmental information, on the other hand, is generated by physical environmental systems, which are created by engineering or environmental departments, among other departments, and it shows an organization's environmental actions in non-financial units (such as hours, litres, or kWh).

These two broad categories of information that are taken into account under EMA are further covered in the IFAC's EMA guidance document (Asiri, Khan and Kend, 2020). The first kind

of information is monetary EMA (MEMA) data, which covers a wide range of environmental expenses such taxes on the environment, protection costs, and materials-driven costs. Data on the use, fluxes, and ultimate destination of materials, energy, water, and wastes make up the second category of information, known as physical EMA (PEMA) information (Asiri, Khan and Kend, 2020). The ability to strategically build environmental management programs like sustainable supply chains management, cleaner production and green product or service design are part of the main advantages of EMA information.

Enhancing internal knowledge and decision-making within organizations is the main goal of EMA (Burritt, Herzig, Schaltegger and Viene, 2019). For a variety of reasons, including the requirement to manage an organization's environmental consequences and to comply with environmental legislation, managers have developed an interest in the information offered by EMA procedures.

Environmental costs may have been decreased if the right information had been provided for them, the way environmental costs have traditionally been accounted for suggests that little effort has been made to lower such costs (Nyakuwanika, Van der poll and van der poll, 2021). They stated the that possibilities to minimize waste may be lost due to a lack of knowledge about the existence of waste if, for instance, material waste is included as part of total raw material costs rather than as waste. A number of accounting techniques, including EMA, carbon management accounting (CMA), and greenhouse-gas accounting (GHGA), have been created as a result of the growing importance of environmental costs in improving waste management (Gunarathe, 2015). It was necessary to establish a more organized method of estimating environmental impacts because the traditional methods that were in use did not take into account the expenses of environmental protection as well as integrated technology (Burritt, Herzig, Schaltegger and Viene, 2019).

With stakeholders now paying more attention to environmental performance, environmental measuring features and information are becoming increasingly important (Burritt, Herzig, Schaltegger and Viene, 2019). Consequently, organizations should employ methods that precisely quantify environmental factors [20], which in turn spurred a rise in interest in environmental accounting (Nyakuwanika, Van der poll and van der poll, 2021). An integrated approach to environmental management can be fostered by the use of EMA in response to environmental concerns (Gunarathe, 2015). According to Nyakuwanika, Van der poll and van der poll (2021), EMA is the most advanced branch of sustainable accounting, and as such, it uses a variety of accounting techniques and procedures to produce both financial and physical data. Environmental impacts can be valued using material flow cost accounting (MFCA), life cycle costing (LCC), and activity-based costing (ABC) techniques (Du Plessis and Oberholzer, 2014).

Organizational Performance

Performance is a multifaceted notion that integrates elements of microeconomics, corporate governance, accounting, management, and finance, making it difficult to define (Tudose, Rusu and Avasilcai, 2022). For instance, profiability, liquidity, growth, and stock market performance are the four characteristics that Hamann and Schiemann (2021) identify as being important to organizational performance. Therefore, different components that may or may not be interdependent comprise the internal architecture of the concept of financial performance.

Tudose and Avasilcai (2020) acknowledged that performance can be viewed as an artifact that determines how successful an organization is, taking into account the views of those who came before it as well as the difficulty in defining the notion. The following explains the arguments in support of this classification. First and foremost, managerial decisions are solely attributable to the human element, with performance being the product of human invention. The attainment of performance, or obtaining a particular degree of performance, necessitates specific behaviors that are unique to each organization and cannot be replicated, resulting in an original outcome. Third, it is possible to improve performance in the future by adapting prior activities to the present (Tudose, Rusu and Avasilcai, 2022).

When examining performance from a financial standpoint, the financial outcomes that a business achieved during a specific time frame were taken into consideration. Therefore, a company's financial outputs must exceed the costs associated with their realization in order for them to be considered financially successful. According to Suhadak et al. (2019), the most recent definitions of financial success take into account factors including a company's effectiveness and efficiency in reaching goals and using resources (Egbunike & Okerekeoti, 2018; Mahrani & Soewarno, 2018). Therefore, a company's financial performance reflects its capacity to attract and generate returns for investors as well as to create economic value (Al-Sa'eed, 2018).

The need to reassess the value of performance indicators arises from the economies' dynamism, changes in the business environment, and adjustments to organizational strategy (Tudose, Rusu and Avasilcai, 2022). Over the past century, worries over the creation of performance measuring models and methods have grown. According to Rajnoha et al. (2016), who conducted an analysis of the literature on the evaluation of financial performance, performance evaluation systems have evolved in two stages: the first stage was centered on productivity, profit, and profitability; the second stage was influenced by shifts in the global market and placed greater emphasis on strategic priorities, with business flexibility and quality indicators of products and services becoming crucial for securing and preserving competitive advantage.

Tudose, Rusu and Avasilcai (2022) summarized the study on financial indicators and underlined the adoption and validation of four generations of financial performance indicators over time: 1. additional value for the business and shareholders; 2. profit margin; 3. profit growth rate; 4. return on equity (ROE), return on investment (ROI), and return on assets (ROA).

Environmental Management Accounting and Organizational Performance

Pursuing a corporate EMA has the potential to yield numerous advantages for organizations (Wijethilake, 2017). Cost savings (Phan and Baird, 2015), stakeholder relationship management (Lee and Min, 2015), eco-innovation performance (Daddi, Testa, Frey and Iraldo, 2016), resource efficiency (Phan and Baird, 2015), regulatory compliance (Phan and Baird, 2015), and pollution prevention (Lee and Min, 2015) are a few examples of how these benefits can be realized. As a result, a growing corpus of research (Adomako, Ning, and Adu-Ameyaw, 2020; Danso et al., 2019) indicates that a company's environmental strategy improves organizational performance. Empirically, a number of researches have shown that environmental strategies, from social, economic, and environmental perspectives, are favorably and significantly correlated with organizational performance (Lee et al., 2016; Park and Lee, 2020; Wijethilake, 2017).

While many researches find a favorable correlation between implementing an EMA and improving organizational performance, certain studies point out that environmental initiatives typically only pay off in particular situations. Organizations can achieve a sustainable competitive advantage, for example, by developing green competencies, such as efficient sustainability control systems like EMA (Journeault, 2016; Wijethilake, 2017). Thus, when adopting environmental management practices, firms try to establish environmental accounting and control systems in order to realize these benefits (Latan et al., 2018). This is a result of the many organizational strategies that force companies to look for particular accounting information systems in order to meet the information needs of managers (Gunarathne and Lee, 2015).

By identifying environmental costs and liabilities and providing information for stakeholders and decision makers, EMA systems, as a decision support tool, can help the firms implement environmental strategies and improve their environmental and economic performance (Schaltegger et al., 2017). Additionally, from the standpoint of planning and control, EMA can provide data to support the implementation and guarantee the success of environmental strategies by enabling appropriate tracking, measurement, and assessments of the steps taken to achieve the corporate financial and ecological goals (Gunarathneand Lee, 2015).

EMA assists businesses in realizing their obligations and reaping any environmental advantages (Burritt et al., 2019). Thus, this makes it possible for them to include environmental management techniques and financial controls into environmental management control systems. EMA supports the measurement, regulation, and public disclosure of an organization's environmental performance (Naranjo Tuesta et al., 2021). It is often known that adopting eco-friendly methods improves business success (Journeault, 2016). The control and decision-making process are enhanced and the influence of the EMA on the environmental performance of the organization is amplified the more sophisticated management accounting methods, such as MA, are used (Solovida and Latan, 2017).

Organizations can decrease environmental costs and more generally lessen the environmental effect of their activities, products, and services by utilizing EMA, a crucial component of sustainability accounting (Gunarathe, Lee and Kaluarachchilage, 2020). According to Chaudhry and Amir (2020), the use of Environmental Management Accounting (EMA) can enhance an organization's environmental performance by facilitating a deeper understanding of the intricacies of its environmental management systems, hence enabling more informed and efficient decision-making. A strong environmental management system helps a business make the best choices possible by utilizing accurate, current, integrated financial and physical data that can help it improve its environmental performance. Previous empirical research such as Erauskin-Tolosa et al., (2020) and Wang et al., (2019) suggested that the implementation of EMA can result in an improvement in the environmental performance of the firm. Additionally, the majority of EMA research is conducted in Western nations, and the academic community has paid very little attention to the topic of sustainable accounting in developing nationsespecially Nigeria.

Theoretical Framework

The research is anchored on the stakeholder’s theory. The fundamental tenet of the stakeholders' theory, which was developed by Freeman in 1984, is that a company's ability to succeed depends on its ability to manage all of its interactions with its stakeholders. Stakeholders are defined by the Stanford Research Institute (SRI) as the groups that the organization could not survive without. According to theory, stakeholders are individuals

who have the power to affect an organization's objectives or who may be impacted by the process of accomplishing those objectives. In addition, it considers environmentalists, government agencies, and local communities to be stakeholders.

The theory suggested that people who engage in risk factors and invest in real, human, and financial capital as well as any significant value might be considered stakeholders. Scholars of stakeholder theory subsequently claimed that stakeholders are individuals or groups who provide certain assets to businesses and organizations that are already investing capital at risk. The focus of the early stakeholder theory was mostly on creditors and shareholders. Next, as the value of sustainability increases, academics propose a broader definition of stakeholders, which includes not just customers and staff but also suppliers and pressure organizations. However, stakeholders are typically classified as follows: suppliers, buyers and customers, competitors, governments, banks and other creditors, owners and shareholders, and employees and customers.

This theory is pertinent to this study because it emphasizes the importance of actively managing connections, the corporate environment, and the advancement of common interests in order to create business strategies. Therefore, management should attempt to create a structure that will be sensitive to the needs of its stakeholders and improve the company's performance.

3. MATERIALS AND METHODS

This research adopted the *ex-post facto* research design because the event under investigation had already taken place. The adoption of this *ex-post facto* research design hinges on two (2) reasons: (1) that the study relied on historic accounting data; and, (2) that the data were obtained from the financial statements and accounts of the selected consumer goods firms.In order to achieve a meaningful result in any research work the target population must be well defined. The population of any study is that group from which a sample is drawn. The group of objects, elements or units about which the study will make some conclusion. Therefore, the population of this research work is made up of all the twenty-one (21) companies in the consumer goods sectors listed on the Nigerian Stock Exchange. Judgmental sampling method was used to select; Nestle Nigeria Plc, Nigeria Breweries Plc, Flour Mills Nigeria PLc, Honeywell Plc, Guinness Nigeria Plc, Dangote sugar Plc, National salt company Plc, PZ Nigeria Plc, Unilever Nigeria Plc and Cadbury Nigeria Plc as the sample size for this study.

Data collected were the book value of return on assets, environmental disclosures and return on equity. Environmental Management Accounting Practices were measured using a disclosure index developed by Fodio and Oba (2012) comprising of twenty established environmental disclosure items. This disclosure index was utilized for its comprehensive nature and the applicability of its indices to the selected case industries. The index used a binary coding system which assigns 1 if item is disclosed and 0 if it is not disclosed. As such, a firm could score a maximum of 20 points and a minimum of 0. The proxy used to measure organizational performance were return on equity and return on assets. The simple linear regression models were estimated using the ordinary least square (OLS) method and ANOVA were used to analyse the data.

4. RESULTS AND DISCUSSIONS

Descriptive Statistics

The descriptive statistics of the main independent variables utilized in the study are presented in Table 4.1 below; the table shows the number of observations, mean, standard deviation, minimum and maximum values of the variables. The description helps in showing the nature of the data.

Summary statistics of variables

```
. summarize EMAD ROA ROE
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Variable	Obs	Mean	Std. Dev.	Min	Max
EMAD	160	6.56875	4.55245	0	18
ROA	160	.146125	.131211	-.11	.72
ROE	160	.349125	.3583705	-.25	1.87

Source: STATA 15 Outputs, 2024

The Obs. column (i.e., observations) shows the number of observations included in the analysis of the independent variables of the study as one hundred and sixty (160). The Mean is a measure of central tendency which calculates the average of a set of observations; while, the Standard Deviation (SD) is a measure of the average distance between the values of the data in the set and the mean. A low SD indicates that the data points tend to be very close to the mean; a high SD indicates that the data points are spread out over a large range of values.

The mean value for EMAD which depicts environmental management accounting disclosure is 6.56875, with a SD of 4.55245 that shows that the values are spread out over a large range of values, a minimum value of 0 and a maximum value of 18. The mean value for ROA is 0.146125, with a SD of 0.131211 which shows that the values are spread out over a small range of values, a minimum value of -0.11 and a maximum value of 0.72. The mean value for ROE is 0.349125, with a SD of 0.3583705 which shows that the values are spread out over a small range of values, a minimum value of -0.25 and a maximum value of 1.87.

Test of Hypotheses

Hypothesis one

HO: Environmental management accounting practice does not have significant effect on return on asset consumer goods firms in Nigeria.

OLS Regression for Hypothesis One

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. regress ROA EMAD
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Source	SS	df	MS	Number of obs	=	160
				F(1, 158)	=	5.90
Model	.098513441	1	.098513441	Prob > F	=	0.0163
Residual	2.63888406	158	.016701798	R-squared	=	0.0360
				Adj R-squared	=	0.0299
Total	2.7373975	159	.017216336	Root MSE	=	.12924

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EMAD	-.0054677	.0022513	-2.43	0.016	-.0099143	-.0010211
_cons	.1820409	.0179745	10.13	0.000	.1465396	.2175422

Source: STATA 15 Outputs, 2024

Decision: since the p-value of 0.016 is less than the margin of error of 0.05, we therefore reject the null hypothesis meaning that environmental management accounting practices have significant effect on return on asset consumer goods firms in Nigeria.

Hypothesis two

Ho: There is no significant difference in the level of corporate environmental disclosure practices among consumer goods firms in Nigeria.

ANOVA for Hypothesis Two

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                                                R-squared =       0.4028
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Source	SS	df	MS	F	Prob > F
Between FIRM	1327.3063	9	147.47847	11.24	0.0000
Within FIRM	1967.9375	150	13.119583		
Total	3295.2438	159	20.724803		

Intraclass correlation	Asy. S.E.	[95% Conf.	Interval]
0.39027	0.12677	0.14181	0.63873

Estimated SD of FIRM effect	2.897832
Estimated SD within FIRM	3.622097
Est. reliability of a FIRM mean (evaluated at n=16.00)	0.91104

Source: STATA 15 Outputs, 2024

Decision: since the p-value of 0.000 is less than the margin of error of 0.05, we therefore reject the null hypothesis meaning that there is significant difference in the level of corporate environmental disclosure practices among consumer goods firms in Nigeria.

Hypothesis three

Ho: Environmental management accounting practice does not have significant effect on the return on equity consumer goods firms in Nigeria.

Table 4.4: OLS Regression for Hypothesis Three

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. regress ROE EMAD
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Source	SS	df	MS	Number of obs	=	160
				F(1, 158)	=	2.14
Model	.272945694	1	.272945694	Prob > F	=	0.1454
Residual	20.1473318	158	.127514758	R-squared	=	0.0134
				Adj R-squared	=	0.0071
Total	20.4202775	159	.128429418	Root MSE	=	.35709

ROE	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EMAD	-.0091011	.0062207	-1.46	0.145	-.0213875	.0031853
_cons	.4089079	.0496656	8.23	0.000	.3108139	.507002

Source: STATA 15 Outputs, 2024

Decision: since the p-value of 0.145 is greater than the margin of error of 0.05, we therefore accept the null hypothesis meaning that environmental management accounting practice does not have significant effect on the return on equity consumer goods firms in Nigeria.

Discussion of Findings

The focal point of this research was to investigate the effect of environmental management accounting practices on organisational performance of consumer goods firms in Nigeria. It also researched to find out if there is a significant difference in the environmental management accounting practices among the firms. The prior studies on financial risk have however shown mixed results.

Firstly, the study found that environmental management accounting practices have significant effect on return on asset consumer goods firms in Nigeria. This finding is in line with the finding of Deb, Rahman and Rahman (2022) that found that EMA is positively and significantly associated with financial performance as measured by ROA. Uzoh (2022) and Okegbe and Ofurum (2019) also supported this finding.

Secondly, the study discovered significant difference in the level of corporate environmental disclosure practices among consumer goods firms in Nigeria. In line with this finding, Onyali, Okafor and Egolum (2014) found that the environmental disclosure practices of firms in Nigeria is still adhoc with each firm reporting differently from another. Musa, Peter and Buka (2015) also found that the non-existence of the standard leads to lack of uniformity in disclosure and variations.

Finally, the study found that environmental management accounting practice does not have significant effect on the return on equity consumer goods firms in Nigeria. This finding is in line with the finding of Nobanee and Ellili (2017) that sustainability disclosures as well as economic, environmental and social disclosures have no significant effects on the performance of UAE firms. However, in contrast to our finding, Olasupo and Akinselure showed that there is significant effect of environmental disclosure on return on equity of the selected quoted oil and gas companies in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

Prior studies observed that pursuing a corporate EMA has the potential to yield numerous advantages for organizations such as; Cost savings, stakeholder relationship management, eco-innovation performance, resource efficiency, regulatory compliance and pollution prevention. This study hence, examined the effect of environmental management accounting practices on organisational performance of consumer goods firm in Nigeria. Several empirical literatures were reviewed both locally and internationally. The Stakeholder theory was the theoretical framework of this study. Ex post facto research design was adopted for this study because of the unalterable nature of the independent variables utilized in the study. The population of the study comprised the consumer goods firms listed on the Nigerian Exchange Group. The sample was delimited to six (10) DMBs that has their annual reports from 2007-2022 online. The study employed the ordinary least square regression technique to analyse the data. This study majorly found a significant effect of EMA on ROA and a non-significant on ROE. The study also found significant difference in the level of corporate environmental disclosure practices among consumer goods firms in Nigeria.The study made several contributions and recommendations based on the findings.

Recommendations

1. Indigenous and multinational consumer goods firms should ensure that strict policies as regards environmental accounting are adhered to, in order to enhance stable organizational performance.
2. Accounting standard setters should develop environmental management accounting disclosure standards that will harmonize the disclosure practices of firms.
3. The government needs to implement environmental management accounting (EMA) in the consumer goods companies because of its important role in providing information that leads to the reduction of negative environmental impacts resulting from the practice of its activities.

REFERENCES

Adomako, S., Ning, E., & Adu-Ameyaw, E. (2020). Proactive environmentalstrategy and firm performance at the bottom of the pyramid. *Business Strategy and the Environment.* https://doi.org/10.1002/bse.2629

Aigbedo, H. (2021). An empirical analysis of the effect of financial performance on environmentalperformance of companies in global supply chains.*Journal of Cleaner Production*, 278(12), 17-41.

Al-Sa'eed, M. A. A. (2018). The impact of ownership structure and dividends on firm's performance: Evidence from manufacturing companies listed on the Amman Stock Exchange. *Australasian Accounting, Business and Finance Journal*, *12*(3), 87–106. https://doi.org/10.14453/aabfjv12i3.7

Asian Productivity Organization (2014). *Manual on Material Flow Cost Accounting: ISO 14051*; APO: Tokyo, Japan.

Asiri, N., Khan, T. & Kend M. (2020). Environmental management accounting in the Middle East and North Africa region: Significance of resource slack and coercive isomorphism. *Journal of Cleaner Production*, 267, 1-15. https://doi.org/10.1016/j.jclepro.2020.121870

Baah, C., Opoku-Agyeman, D., Acquah, I.S.K., Agyabeng-Mensah, Y., Afum, E., Faibil, D. & Abdoulaye, F.A.M. (2021). Examining the correlations between stakeholder pressures, greenproduction practices, firm reputation, environmental and financial performance: evidence frommanufacturing SMEs.*Sustainable Production and Consumption*, 27,100-114.

Burritt, R.L., Herzig, C., Schaltegger, S. & Viere, T. (2019). Diffusion of Environmental Management Accounting for Cleaner Production:Evidence from Some Case Studies. *J. Clean. Prod.224*, 479–491.

Christ, K.L.& Burritt, R.L. (2015). Material flow cost accounting: A review and agenda for future research. *J. Clean. Prod.108*,1378–1389.

Christine, D., Yadiati, W., Afiah, N.N. &Fitrijanti, T. (2019). The relationship of environmentalmanagement accounting, environmental strategy and managerial commitment withenvironmental performance and economic performance.*International Journal of Energy Economics and Policy*, 9(5),458-464.

Daddi, T., Testa, F., Frey, M., & Iraldo, F. (2016). Exploring the link betweeninstitutional pressures and environmental management systemseffectiveness: An empirical study. *Journal of Environmental Management*, 183, 647–656. https://doi.org/10.1016/j.jenvman.2016.09.025

Danso, A., Adomako, S., Amankwah-Amoah, J., Owusu-Agyei, S., & Konadu, R. (2019). Environmental sustainability orientation, competitive strategy and financial performance. *Business Strategy and the Environment*, 28(5), 885–895.

Deb, B. C., Rahman, M. & Rahman, M.S. (2022). The impact of environmental management accounting on environmental and financial performance: empirical evidence from Bangladesh. *Journal of Accounting & Organizational Change*, (n.d) DOI: 10.1108/JAOC-11-2021-0157

Du Plessis, A.; Oberholzer, M. (2014). A Framework for measuring and internal reporting of environmental costs at a mine. *Environ.Econ.5*, 53–62.

Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic factors, firm characteristics and financial performance: A study of selected quoted manufacturing firms in Nigeria. *Asian Journal of Accounting Research*, *3*(2), 142–168. https://doi.org/10.1108/AJAR-09-2018-0029

Fakoya, M.B. (2013). Integrated waste management decisions in South Africa: The role of the management accounting function. *J. Hum.Ecol. 43*, 249–255.

Fakoya, B.M.; & Van der Poll, M.H. (2013). Integrating ERP and MFCA systems for improved waste-reduction decisions in a brewery inSouth Africa. *J. Clean. Prod. 40*, 136–140.

Guenther, E.,Jasch, C., Schmidt, M., Wagner, B.&Ilg, P. (2015). Material flow cost accounting—Looking back and ahead. *J. Clean. Prod.108*, 1249–1254.

Gunarathne, A.D.N. (2015). Fostering the adoption of environmental management with the help of accounting: An integrated framework.In *Social Audit Regulation*; Springer International Publishing: Cham, Switzerland.

Gunarathne, N., & Lee, K.-H. (2015). Environmental management accounting (EMA) for environmental management and organizational change:An eco-control approach. *Journal of Accounting and Organizational Change*, 11(3), 362–383.

Gunarathne, A.D.N., Lee, K.-H. & Hitigala Kaluarachchilage, P.K. (2021). Institutional pressures, environmental management strategy, and organizational performance: The role ofenvironmental management accounting.*Business Strategy and the Environment*,30(2),825-839.

Hamann, M., &Schiemann, F. (2021). Organizational performance as a set of four dimensions: An empirical analysis. *Journal of Business Research*, *127*, 45–65. https://doi.org/10.1016/j.jbusres.2021.01.012

Iredele, O.O., Tankiso, M. & Adelowotan, M.O. (2020). The influence of institutional isomorphism and organisational factors on environmental management accounting practices of listed Nigerian and South African firms. *South African Journal of Accounting Research*, 34(3),183-204.

Jasch, C. (2006). How to perform an environmental management cost assessment in one day. *J. Clean. Prod.14*, 1194–1213.

Jinadu, O., Agbeyangi, B.A. & Mamidu, I.A. (2015). Impact of environmental managementaccounting on current practices and future sustainability in South-West Nigerian polytechnics. *International Journal of Economics Commerce and Management*, 3(10), 586-603.

Journeault, M. (2016). The influence of the eco-control package on environmental and economic performance: A natural resource-basedapproach. *Journal of Management Accounting Research*, 28(2), 149–178.

Kokubu, K.&Tachikawa, H. (2013). Material flow cost accounting: Significance and practical approach. In *Handbook of SustainableEngineering*; Kauffman, J., Lee, K., Eds.; Springer: Dordrecht, The Netherlands, 351–369.

Latan, H., Jabbour, C. J. C., de Sousa Jabbour, A. B. L., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmentaluncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting. *Journal of Cleaner Production*, 180, 297–306.

Lawal, B. A., Florence, M. & Willy, M. (2016). The Effect of identification of Environmental Cost on quality ofDisclosure: A Critical Analysis of Shipping Lines in Nigeria. *European Journal of Business, Economics andAccounting*.

Lee, K.-H., Cin, B. C., & Lee, E. Y. (2016). Environmental responsibility and firm performance: The application of an environmental, social and governance model. *Business Strategy and the Environment*, 25(1), 40–53.

Lee, K.-H., & Min, B. (2015). Green R&D for eco-innovation and its impact on carbon emissions and firm performance. *Journal of Cleaner Production*, 108, 534–543.

Mahmoudi, E., Jodeiri, N., Fatehifar, E. (2017). Implementation of material flow cost accounting for efficiency improvement in wastewatertreatment unit of Tabriz oil refining company. *J. Clean. Prod. 165*, 530–536.

Mahrani, M., & Soewarno, N. (2018). Th effect of good corporate governance mechanism and corporate social responsibility on financial performance with earnings management as mediating variable. *Asian Journal of Accounting Research*, *3*(1), 41–60. https://doi.org/10.1108/AJAR-06-2018-0008

Nyakuwanika, M.; van der Poll, H.M.; van der Poll, J.A. (2021). A conceptualframework for greenergoldmining through environmental management accounting practices (EMAPS): The case of Zimbabwe.*Sustainability*, 13(10466), 1-26.https://doi.org/10.3390/su131810466

Park, B., & Lee, K.-H. (2020). The sensitivity of corporate social performance to corporate financial performance: A "time-based" agency theory perspective. *Australian Journal of Management.* https://doi.org/10.1177/0312896220917192

Phan, T. N., & Baird, K. (2015). The comprehensiveness of environmental management systems: The influence of institutional pressures and theimpact on environmental performance. *Journal of Environmental Management*, 160, 45–56.https://doi.org/10.1016/j.jenvman.2015.06.006

Rajnoha, R., Lesníková, P., & Korauš, A. (2016). From financial measures to strategic performancemeasurement system and corporate sustainability: Empirical evidence from Slovakia. *Economicsand Sociology*, *9*(4), 134–152. https://doi.org/10.14254/2071-789X.2016/9-4/8

Saeidi, S.P., Othman, M.S.H., Saeidi, P. & Saeidi, S.P. (2018). The moderating role of environmental management accounting between environmental innovation and firm financial performance. *International Journal of Business Performance Management*, 19 (3), 326-348.

Schaltegger, S., Etxeberria, I. A., & Ortas, E. (2017). Innovating corporate accounting and reporting for sustainability—Attributes and challenges.*Sustainable Development*, 25, 113–122.

Schaltegger, S. & Zvezdov, D. (2015). Expanding material flow cost accounting. Framework, review and potentials. *J. Clean. Prod.108*, 1333–1341.

Schmidt, M. (2015). The interpretation and extension of Material Flow Cost Accounting (MFCA) in the context of environmental materialflow analysis. *J. Clean. Prod.108*, 1310–1319.

Schmidt, A.; Götze, U.; & Sygulla, R. (2015). Extending the scope of material flow cost accounting—Methodical refinements and use case. *J.Clean. Prod.108*.

Suhadak, S., Kurniaty, K., Handayani, S. R., & Rahayu, S. M. (2019). Stock return and financial performance as moderation variable in influence of good corporate governance towards corporate value. *Asian Journal of Accounting Research*, *4*(1), 18–34. https://doi.org/10.1108/AJAR-07-2018-0021

Tajelawi, O.A. & Garbharran, H.L (2015). MFCA: An environmental management accounting technique for optimal resource efficiency inproduction processes. *Int. J. Soc. Behav. Educ. Econ. Bus. Ind. Eng. 9*, 3758–3763.

Tudose, M. B., & Avasilcai, S. (2020). *A review of the research on financial performance and its determinants*. In G. Prostean, J. LaviosVillahoz, L. Brancu, & G. Bakacsi (Eds.), *Innovation in sustainable management and entrepreneurship*. SIM 2019. *Springer Proceedings in Business and Economics* (pp. 229–244). Springer, Cham. https://doi.org/10.1007/978-3-030-44711-3_17

Tudose, M. B., Rusu, V. D., & Avasilcai, S. (2022). Financial performance – determinants and interdependencies between measurement indicators. *Business, Management and Economics Engineering*,20(1),119-138. https://doi.org/10.3846/bmee.2022.16732

Wang, S., Wang, H., & Wang, J. (2019). Exploring the effects of institutional pressures on the implementation of environmental managementaccounting: Do top management support and perceived benefit work? *Business Strategy and the Environment*, 28(1), 233–243.

Wijethilake, C. (2017). Proactive sustainability strategy and corporate sustainability performance: The mediating effect of sustainability controlsystems. *Journal of Environmental Management*, 196, 569–582. https://doi.org/10.1016/j.jenvman.2017.03.057

Wu, J., Yang, J. & Zhou, Z. (2020). How does environmental regulation affect environmental performance? A case study of China' s regional energy efficiency. *Expert Systems*, 37(3), 12-32.

Yagi, M. & Kokubu, K. (2018). Corporate material flow management in Thailand: The way to material flow cost accounting. *J. Clean. Prod.198*, 763–775.

APPENDIX I: TWENTY ESTABLISHED ENVIRONMENTAL CHECKLIST

ENVIRONMENT MANAGEMENT	1) Compliance with environmental laws/regulations
	2) Environmental policies
	3) Environmental audit
	4) Environmental committee in board/department for pollution
	5) Environmental research and development
	6) Environmental performance section in annual report.
	7) Environmental spending- fines, penalties and compensation
	8) Financial data on environmental savings or investments/expenses or liabilities.
IMPACT ON BIODIVERSITY	9) Emissions- air, water, noise, waste, greenhouse gas, ozone depleting substances, spills.
	10) Recycling waste products/waste management
	11) Materials, water, and energy conservation
	1 2) Awards for environmental vision and strategy.
FAIR LABOUR PRACTICES	13) Staff diversity- Employment of physically disabled, employment of women, and multi-ethnicity.
	14) Staff protection- Work place safety and security, information on accidents at workplace.
	15) Staff training, career development and employees' welfare.
	16) Compliance with labour standards.
PRODUCTS AND ENERGY	17) Product innovation and packaging, product life cycle management.
	18) Identification of environmental impacts of products/services.
	19) Disclosing energy savings resulting from products/services. .
	20) Disclosing company's energy policies.