ENVIRONMENTAL COST DISCLOSURE AND CORPORATE PERFORMANCE OF QUOTED CONSTRUCTION FIRMS IN NIGERIA

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ABSTRACT
This study determined the effect of Environmental Disclosure and Performance of Quoted Nigerian Construction Firms. Specifically, the objectives of the study are to: ascertain the degree in which pollution control cost affect return on assets of quoted construction firms in Nigeria, determine the dimension with which environmental protection cost affect return on assets of quoted construction firms in Nigeria and ascertain the extent environmental recycling disclosure affect return on assets of quoted construction firms in Nigeria. The study adopted *Ex Post Facto* research design. Hypotheses were formulated in line with the research objectives and tested using linear regression analysis with the aid of SPSS Version 20.0. It was observed that environmental pollution prevention cost, environmental protection cost and environmental recycling disclosure have effects on return on assets of quoted construction firms in Nigeria. The study recommended among others that regular and continuous environmental evaluation will improve organizations sales, income and ensure that environmental situational needs are met.

Keywords: *Environmental pollution control, environmental protection cost, recycling disclosure, financial performance and construction firms in Nigeria.*

INTRODUCTION

Environmental Management Systems (EMS) have emerged as a means of systematically applying business management to environmental costs to enhance a firm's long-run financial performance in order to develop processes and products that can simultaneously improve competitive and environmental performance. However, in Nigeria, construction firm is one of the sectors in economy that has attracted a lot of public outcry on environmental issues. Even though a major source of revenue to the country, their activities are often associated with severe health implications and environmental degradation which in recent time have caused nagging social disputes and disruption of some multinational companies economic activities (Uwaoma & Ordu, 2016). Hence, the need for sustainable environmental cost management in the manufacturing industries has thus become the concern of most nations and the responsibility of corporate managements across the globe. Organizations are now expected to be able to demonstrate that they are aware and addressing the impact of their operations on the environment and society in general (Uwuigbe & Jimoh, 2012).

Environmental Cost Disclosure (ECD) systems have the dual purpose of managing and improving the financial and environmental performance of a corporate firm. According to Burritt, Hahu, Schaltergger (2001), ECD can generate information about the use of resources with environmentally related impacts on the financial position and performance of companies.

Moreover, the environmental effect on corporate organizations may result in incurring future capital expenditure and cash flows which may impinge on going concern as balance sheet secured loans may not be secured after all its land values for instance are affected by environmental factors. Also, the limited awareness of environmental costing principles and methodology has become an important issue to be addressed (Bassey, Oba & Onyah, 2013). As it explicitly treats environmental costs and tracks environmental information, ECD highlights hidden environmental costs and benefits (Jasch, 2003). Being a subset of environmental accounting, Environmental Cost Disclosure (ECD) is regarded as an extension of conventional cost accounting, and it is the focus of this research. According to Bartolomeo, Bennett, Bouma, Heydkamp, James and Wolters (2000), ECD is seen as the generation, analysis and use of financial and non-financial environment related information in order to improve organizational financial and environmental performance.

Most of researchers have explored how the stringency of the environmental policy regime affects a company's ECD applicability and financial performance. Most of the studies that examined the relationship between environmental management and firm performance, some found negative relationship. Example; Amacha and Dastane (2017); Nobanee and Ellili (2017); Kasum and Osemene (2010); Ezejiofor, John-Akamelu and Chigbo (2016); Olaoye and Adekanmbi (2018) while many found positive relationship. Clause and Rikhardsson (2008) Ding (2009); Beredugo and Mefor (2012); Moorthy and Yacob, (2013); Okoye and Ezejiofor (2013); Nwaiwu and Oluka (2018); Mohamed (2018); Mayangsari (2018) discovered that sustainable environmental accounting has significant impact on corporate productivity in order to enhance corporate growth. The findings of these studies were uncertain, besides few research of this nature focused on those costs incurred by these entities

in maintaining their environment where they operate in order to ascertain whether this affects corporate profitability, sustainability, integrity and reputation.

However, several reasons could be attributed to these observed inconsistencies in prior studies. A look at the previous studies particularly those by Nigerian authors show a large domination of samples comprising only of a single sub-sector with the most current data being that of 2014 (Nnamani, Onyekwelu & Ugwu, 2017). Against the backdrop, this study established the extent environmental cost disclosure has impacted on performance of quoted construction firms in Nigeria.

Objectives of the Study

The main objective of this study is to determine the effect of environmental cost disclosure on performance of quoted construction firms in Nigeria. Specifically, the objectives of the study are to;

1. Ascertain the extent to which pollution control costs affect performance of quoted construction firms in Nigeria.
2. Determine the extent to which environmental protection costs affect performance of quoted construction firms in Nigeria.
3. Examine the extent to which environmental recycling disclosure affect performance of quoted construction firms in Nigeria.

REVIEW OF RELATED LITERATURE

Conceptual Framework

Accounting for environmental costs though, the issues of environmental and social reporting are not explicitly provided for in the companies and allied matters act, has been catered for by both local and international standards like ISAR, Global reporting Index (GR). Corporate performance is no longer seen simply as being equivalent to and consequently measurable in terms of profitability alone. Information on the accounting for environmental costs is now required. Each types of cost are to be considered as it arises so as to accord it the appropriate treatment in line with Generally Accepted Accounting Principles (GAAP5) (Nwaiwu & Oluka, 2018).

ECD can be defined as the generation and analysis of both financial and non-financial information in order to support internal environmental management processes (Shane, 2005). It is complementary to the conventional financial management accounting approach, with the aim to develop appropriate mechanisms that assist in the identification and allocation of environment-related costs (Bennett & James, 1998). The major areas for ECD application include; in the assessment of annual environmental costs/expenditures, product pricing, budgeting, investment appraisal, calculating costs, and savings of environmental projects, or setting quantified performance target. Besides being a tool for reporting environmental costs to external stakeholders, the ECD has an internal company-level function and focus (Jasch, 2003; Lange & Alferi, 2004).

According to Gray and Bebbington (2001), environmental accounting includes: Accounting for contingent environmental liabilities/risks. Accounting for asset re-valuations and capital projections as they relate to the environment Cost analysis in key areas such as energy, waste and environmental protection Investment appraisal to include environmental factors, development of new accounting and information systems to cover all areas of environmental performance, assessing the costs and benefits of environmental improvement programs, developing accounting techniques which express assets and liabilities and costs in ecological (non-financial) terms. USEPA (2005) asserts that the term environmental accounting has many meanings and uses. It can refer to national income accounting, financial accounting, or internal business managerial accounting. National income accounting is a macroeconomic measure. GDP is an example and has been frequently used as a key measure of the society's economic wellbeing with the consideration of environmental depletion and degradation costs. In this context, environmental accounting has been termed natural resources accounting.

Operational Variables

Due to the pressures of overconsumption, population growth and technology, the biophysical environment is being degraded, sometimes permanently. This has been recognized, and governments have begun placing restraints on activities that cause environmental degradation.

i. Environmental Pollution Control

Environmental Pollution control is any action that minimizes the amount of contaminants released into the environment. By implementing P2 processes, fewer hazards will be posed to both public health and natural wellbeing.

Pollution is the contamination of air, soil, or water by the discharge of harmful substances. Pollution control is the reduction or elimination of pollution at the source (source reduction) instead of at the end-of-the-pipe or stack. Pollution control occurs when raw materials, water, energy and other resources are utilized more efficiently, when less harmful substances are substituted for hazardous ones, and when toxic substances are eliminated from the production process. By reducing the use and production of hazardous substances, and by operating more efficiently we protect human health, strengthen our economic well-being, and preserve the environment.

ii. Environmental Protection Cost

The U.S. market blossomed shortly after Congress passed the Clean Water Act and the Environmental Protection Agency issued implementing regulations aimed at preventing the loss of streams and wetlands, and in the wake of the passage of the Endangered Species Act of 1973. The Surface Mining Control and Reclamation Act of 1977 also created restoration opportunities. When regulations stemming from these laws came online in the mid-1980s, there were few firms that were qualified or experienced in performing large-scale restoration projects. The first estimate of the dollars and jobs in the U.S. was $9.5 billion in annual sales, with 126,000 people employed.

iii. Recycling Disclosure

Recycling is the process of converting waste materials into new materials and objects. It is an alternative to "conventional" waste disposal that can save material and help lower greenhouse gas emissions. Recycling can prevent the waste of potentially useful materials and reduce the consumption of fresh raw materials, thereby reducing: energy usage, air pollution (from incineration), and water pollution (from landfilling).

Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, and Recycle" waste hierarchy. Thus, recycling aims at environmental sustainability by substituting raw material inputs into and redirecting waste outputs out of the economic system.

Recyclable materials include many kinds of glass, paper, cardboard, metal, plastic, tires, textiles, and electronics. The composting or other reuse of biodegradable wastes such as food or garden wastes is also considered recycling. Materials to be recycled are either brought to a collection center or picked up from the curbside, then sorted, cleaned, and reprocessed into new materials destined for manufacturing.

Corporate Performance

There are various aspects of performance, each of which contributes to the overall performance in an organization. Despite the evolution of various available benchmarks and performance measurement, the answer to what is performance may still be hard to pin down. Hansen and Mowen (2005), states that firm performance is very essential to management as it is an outcome which has been achieved by an individual or a group of individuals in an organization related to its authority and responsibility in achieving the goal legally, not against the law, and conforming to the moral and ethic. Performance is the function of the ability of an organization to gain and manage the resources in several different ways to develop competitive advantage.

In addition, measuring performance is very important because it builds on the results, make different decisions in economic units. According to (Benjalux, 2006), performance measures are the life blood of economic units, since without them no decisions can be made. Financial Performance Measure is one of the important performance measures for economic units. Financial performance measures are used as the indicators to evaluate the success of economic units in achieving stated strategies, objectives and critical success factors (Katja, 2009).

Return on Assets (ROA)

ROA gives profitability on assets of the firm after meeting all expenses and taxes. It measures the profit of the firm after tax for each dollar invested in assets (Horne & Wachowicz 2005). It is indicator of managerial performance. So, higher value of this ratio means better managerial performance (Ross, Westerfield & Jaffe, 2005). ROA can be increased by increasing profit margin or asset turnover.

ROA = Net Profit / Total Assets.

Empirical Review

Quite numbers of studies have been examined on environmental issues in relation with financial performance of corporate organizations. Olaoye and Adekanmbi (2018) ascertain the impact of environmental management accounting practices on financial performance. The study used descriptive design survey through structured questionnaire. The findings revealed that there is low present practice of environmental management accounting in South West Nigerian universities. Hengky, Charbel, Ana, Samuel and Muhammad (2018) examined the effect of the combination of corporate environmental strategy, top management commitment, and environmental uncertainty, with a focus on the role of Environmental Cost Disclosure (ECD) on corporate environmental performance. The empirical evidence shows that there is a positive and significant influence between those organizational resources and environmental performance of companies. Mayangsari (2018) determined the influence of environmental performance on the financial report integrity. The statistics used were primary data from questionnaires. The results of this research show that regulatory interventions will be critical to environmental issues.

Amacha and Dastane (2017) determined the relationship between sustainability practices and firm performance in the Malaysian Oil and Gas sector. Secondary data sources as sourced from a sample size of 21 oil and gas firms from 2011 to 2013 with the aid of a multiple regression model run via SPSS 21. There result shows that the majority of oil and gas companies in Malaysia had poor performance in terms of sustainability disclosure. Nobanee and Ellili (2017) ascertained the impact of economic, environmental, and social sustainability reporting on financial performance of UAE Banks during the period 2003-2013. The study adopted three sustainability disclosure dimensions including; economic, environmental and social dimensions against banking performance which they measured using ROA. Employing a panel data analysis technique, the study shows that sustainability disclosures as well as economic, environmental and social disclosures have no significant effects on the banking performance of UAE banks, whether they are conventional or Islamic banks.

Ezejiofor, John-Akamelu, and Chigbo (2016) assessed the effect of sustainability accounting measure on the performance of corporate organizations in Nigeria. The study adopted ex post facto research design. Data for study was collected from annual reports and accounts of the company in Nigeria and tested the data using Regression Analysis with aid of SPSS Version 20.0. The study found that environmental cost does not impact positively on revenue of corporate organizations in Nigeria. Owolabi, Akinwunmi, Adetula & Uwuigbe (2016) determined the extent of sustainability reporting practiced by Lafarge Africa Plc. Content analysis was used to analyze the data extracted from their annual reports. The study found no disclosures on human rights issues, 3% environmental disclosures and an aggregate of 30% disclosure based on one hundred and sixty-nine indicators used. Malarvizhi and Ranjanni (2016) conducted a research to examine whether there is any significant relationship between Corporate Environmental Disclosure (CED) and firm performance of selected companies listed in Bombay Stock Exchange (BSE), India. The study used content analysis methodology by developing an environmental disclosure index (EDI) and formulating hypotheses to test the association between firm performance and level of environmental disclosure. Results

show there is no significant relationship between the level of environmental disclosure and firm performance.

Shehu (2014) ascertained the effect of environmental expenditure on the performance of quoted Nigerian oil companies, within a period of twelve years (1999-2010) using selected firm financial statement of all quoted oil companies listed in the Nigerian Stock Exchange. The data was analyzed using multiple regression analysis. The result reveals that environmental expenditure has significant effect on the performance of quoted oil companies in Nigeria.

Okoye and Ezejiofor (2013) determined the appraisal of Sustainability environmental accounting in enhancing corporate performance. Data were analyzed and tested with Pearson Product Movement Correlation Co-efficient. The study discovered that sustainable environmental accounting has significant impact on corporate productivity in order to enhance corporate growth. Bassey, Oba and Onyah (2013) critically analyze the extent of implementation of environmental cost management and its impact on output of oil and gas companies in Nigeria from 2001 to 2010. The paper was aimed at ascertaining the extent to which implementation of environment cost management has impacted on the oil and gas industries in Nigeria. The study used multiple regression analytical technique. Findings revealed that there is a significant relationship between the parameters that influence environmental cost management and output of oil and gas produced in Nigeria. The study of Wibowo (2012) examined the impact of corporate social responsibility disclosure and profitability (measured by Return on Asset) using a sample of 25 firms from SRI-KEHATI Index and covering the period 2005 to 2010. Findings show that there is positive impact of the social performance to the profitability of the firms and also there is positive impact of the profitability of the company to the social performance of the firms. Lars and Henrik (2005) investigated the effect of environmental information on the market value of listed companies in Sweden using a residual income valuation model. The results show that environmental responsibility as disclosed by sampled companies has value relevance, since it is expected to affect the future earnings of the listed companies. Their finding has implications for companies that pollute the environment - their future solvency may be eroded with gradual depletion in earnings.

Most of researchers have explored how the stringency of the environmental policy regime affects a company's ECD applicability and financial performance. Most of the studies which examined the relationship between environmental management and firm performance were inconsistent in their results. Excluding the fact those country-specifics and other peculiarities may influence the outcome of studies conducted in both developed and developing countries because of divers ways corporations respond to environmental and social concerns in different crimes. A look at the previous studies particularly those by Nigeria authors show a large domination of samples comprising only of a single sub-sector.

METHODOLOGY

Research Design

Due to the nature of the study, ex-post facto research design and content analysis data were adopted in collecting data from financial reports and accounts from 2011-2017. Ex-post facto research design will be used to determine the effect of environmental cost disclosure and performance of quoted construction firms Nigeria.

Population and Determination of Sample Size

The population of the study covered six construction firms quoted on the Nigerian Stock Exchange as at 31st December 2017. The study covered seven years annual reports and accounts of these companies from 2011 to 2017. The sample size was carried out on the six quoted companies of construction firms in Nigeria as listed on the NSE as at 31st December 2018. The researcher had intention of carrying all the companies along to the completion of this study - Arbico Plc., Cappa & D'Alberto Plc., Costain (West Africa) Plc., G. Cappa Plc., Julius Berger Nigeria Plc., Annd Roads Nigeria Plc.

Method of Data Analysis

The statistical model chosen for the analysis is multiple linear regression and analysis of variance (ANOVA), with the aid of SPSS 20.0 software. Four sets of hypotheses were advanced for confirmation in this study.

Decision Rule

The decision for the hypotheses is to accept the alternative hypothesis if the P-value of the test statistic is positive and significant at 5% significant level. P-value less than 5%, reject, P-value greater than 5% then do not reject.

Model Specification

The estimated model takes the following form:

$ROA_{it} = a_0 + \mu_i + \beta_1 ENVRC + \beta_2 ENVPPC_{it} + \beta_3 ENVPC_{it} + \beta_4 ENVRD_{it} \sum_{it}$ …..……...(i)

$ROA_{it} = a_0 + \mu_i + \beta_I ENVRC_{it} + \sum_{it}$ ……..…..…..(ii)

$ROA_{it} = a_0 + \mu_i + \beta_I ENVPPC_{it} + \sum_{it}$ ……..…….……(iii)

$ROA_{it} = a_0 + \mu_i + \beta_I ENVPC_{it} + \sum_{it}$ ……...(iv)

$ROA_{it} = a_0 + \mu_i + \beta_I ENVRD_{it} + \sum_{it}$ ……...(iv)

Where:

The dependent variable: Corporate performance (ROA) and

The Independent variables:

ENVPPC = environmental pollution control cost

ENVPC= environmental protection cost

ENVRD= environmental cost resource recycling

a_0 = slope of the model

β_I, β_2, β_3, = coefficient of parameters.

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

Data Analysis

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	7	1.09	1.81	1.3043	.23557
ENVPOCC	7	21.00	128.00	39.7143	39.02441
ENVPC	7	29.00	36.00	33.4286	2.76026
CSTRR	7	16.00	25.00	20.1429	3.62531
Valid N (listwise)	7				

Table 1 shows the mean (average) for each of the variables, their maximum values, minimum values, standard deviation. The results in table 1 provided some insight into the nature of the selected Nigerian quoted companies that were used in this study.

Firstly, it was observed that on the average over the seven (7) years periods (2011-2017), the sampled quoted companies in Nigeria were characterized by positive firm performance (ROA =1.3043). Also, the large difference between the maximum and minimum value of the environmental pollution control cost (ENVPCC), environmental protection cost (ENVPC) and cost of resource recycling (CSTRR) show that the sampled quoted companies in this study are not dominated by companies with environmental cost disclosure. This means that any variables with outlier are not likely to distort our conclusion and are therefore reliable for drawing generalization.

Testing of Hypotheses

The hypotheses formulated in this study are tested with the use of linear regression analysis. The decisions reached on hypotheses are based on the result obtained from regression calculation and the tabulated value of the regression distribution.

Decision Rule

If the computed value of regression is less than the critical value, the null hypotheses (Ho) are accepted and the alternative hypotheses (Hi) rejected. If the value of regression is greater than the critical value, the alternative hypotheses (Hi) are accepted and the null hypotheses (Ho) are not rejected.

Hypothesis One

Ho: Pollution control cost does not have significant effect on firms' return on assets.

4.2b Regression coefficient for pollution prevention cost on firms' return on assets

Model	B	Beta	T = test
Constant	4.031		T=.167, P=.882
Air pollution	.104	.	T=.074,p=.947
Water pollution	.572	081	T=.483, p=.677
Conservation of natural resources	.449	.381	T=.176, p=.876
		.178	

Note: r^2 = .34, f (3,2) = .087, p= .961

a. Predictors: (Constant), conservation of natural resources, air pollution, water pollution.

Source: Researcher's computation, 2019

Table 4.2c**:** Anova result for pollution control cost on firm' return on assets.

Model		Sum of Squares	Df	Mean Square	F
	Regression	2.075	3	.692	.087
1	Residual	15.961	2	.7.981	
	Total	18.037	5		

a. Dependent Variable: Return on Asset

b. Predictors: (Constant), Conservation of natural resources, Water pollution, Air pollution

Source: Researcher's computation, 2019

Environmental pollution control cost explains 34 per cent of variation experienced in firms' return on assets, but the result is not significant f(3,2) = .087, P > 0.05.

Decision

Based on the analysis above, the null hypothesis (H0) is accepted, which state that pollution control cost has no significant effect on firms' return on assets.

Hypothesis Two

Ho: Environmental protection cost does not have significant effect on firms' return on assets.

4.3b Regression coefficient for environmental protection cost on firms' return on assets.

Model	B	Beta	T = test
Constant	34.799		T=4.635, P=.019
Energy saving measure Water pollution	.702	.925	T=.6.468,p=.007
Global warming reduction measure	1.009	.333	T= 3.032, p=.056

Note: r^2 =.94, F(2,3) =.940, P =0.01

a. Predictors: (Constant), Global warming reduction measure, Energy saving measure

Source: Researcher's computation, 2019

4.3c. Anova result for environmental protection cost on firms' return on assets.

Model		Sum of Squares	Df	Mean Square	F
	Regression	16.948	2	8.474	23.355
1	Residual	1.089	3	.363	
	Total	18.037	5		

Source: Researcher's computation, 2019

a) Dependent variable: Return on assets.

b) Predictors: (Constant), Global warming reduction measure, Energy saving measure

Environmental pollution protection cost explains 94 per cent of variation experienced in firms' return on assets, and this result is significant f(2,3) = .23355, P < 0.05.

Decision

Based on the analysis above, the alternative hypothesis (Hi) is not rejected which states that environmental protection cost has significant effect in firms' return on assets.

Hypothesis Three

Ho: Cost of resource recycling does not have significant effect on firms' return on assets.

Table 4.4b: Regression co-efficient for environmental recycling cost on firms' return on assets

Model	**B**	**Beta**	**T = test**
Constant	1.451		T= .144, P=.894
Disposal of industrial waste Recycling industrial waste	.434 .257	.248 .509	T=.517,,p=.641 T=.1.062, p=.366

Note: r^2 = 31, f (2,3) = .679, p= .571

a. Dependent variable: return on assets

Source: Researcher's computation, 2019

Table 4.4c: Anova result for environmental recycling cost on firms' return on assets.

Model		Sum of Squares	Df	Mean Square	F
1	Regression	5.618	2	2.809	.679
	Residual	12.419	3	4.140	
	Total	18.037	5		

Source: Researcher's computation, 2019

a) Dependent variable: Return on assets
b) Predictor (constant), Disposal of industrial waste, Recycling industrial waste

Environmental recycling cost explains 31 per cent of variation experienced in firms' return on assets, and this result is significant f(2,3) = .679, P > 0.05.

Decision

Based on the analysis above, the alternative hypothesis (Hi) is not rejected which states that cost of resource recycling has significant effect on firms return on assets.

Discussion of Results

Based on the outcomes from the hypotheses tested, environmental cost disclosure has impacted positively and significantly on the corporate performance of quoted construction firms in Nigeria. This means that increase on the environmental cost disclosure can affect the operations of corporate firms.

This finding agrees with Ezejiofor, John-Akamelu, and Chigbo (2016) whose study found that environmental cost impact positively on revenue of corporate organizations in Nigeria, also that environmental cost impacted positively on profit generation of corporate organizations in Nigeria.

Dabbas and Al-rawashdeh (2012) revealed that there is a significant relationship between the costs of environmental activities, such as the provision of donations/establishment of non-

profit projects, support projects/charities and the profitability of industrial companies. Also the finding of Wibowo (2012), show that there is positive impact of the social performance to the profitability of the firms. Amacha and Dastane (2017) on their result concluded that a strong and significant relationship exist between sustainability practices and financial performance of companies. Sayedeh, and saudah (2014), Lubomir and Dietrich (2009) on their analytical results indicate strongly that better environmental performance improves profitability by driving down costs more than it drives down revenues.

CONCLUSION, RECOMMENDATIONS

Conclusion

From the empirical results, environmental cost disclosure significantly and positively relates to corporate performance of the quoted construction firms in Nigeria. This indicates that continuous environmental evaluation handled in an acceptable way garners sales and therefore improves income. Compliance to environmental laws also significantly and positively relate to perceived financial performance.

It can be concluded that environmental related cost management positively influences firms' profitability and enhances organizational performance, that large firms significantly reports and discloses environmental related information, also that environmental friendly organization enjoys high level of corporate cooperativeness. Measuring performance and setting targets is a critical component for organizations to become more productive, more profitable, and more sustainable.

Recommendations

Based on the findings of this study, the researcher recommends as follows:

1. That firms should make policies that will control environmental pollution.
2. That firms should reduce their spending on environmental protection or make it cost effective in other to increase firms' return on assets.
3. That environmental resource recycling cost should be decreased for better environmental protection and also increase return on assets.

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