



Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

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ABSTRACT

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The essence of this study is to evaluate the effect of three aspects of Sustainability reporting on economic value addition of Nigerian listed manufacturing companies from 2013 to 2020. Ex-post facto research design was adopted while secondary data were sourced from annual reports and accounts of 37 sampled companies out of 73 listed manufacturing companies in Nigeria as at 30th September 2019. The panel data gathered for the study were subjected to empirical tests using panel regression techniques (random effect) at 5% level of significance. Evidence generated revealed among others that economic, social and environmental reporting aspects of sustainability reporting all had positive effect on economic value added over the period. However, the effects were found to be significant for economic and social reporting while the effect of environmental reporting was not statistically significant. Consequently, it was concluded that sustainability reporting has significant positive effect on economic value addition by listed manufacturing companies in Nigeria. This study therefore recommends amongst others that business organizations should incorporate sustainability reporting in their reporting system to reap the associated benefit of economic value added which should also be measured and reported annually. By policy implication, government across countries should put in place, annual awards and recognition programmes for companies with highest disclosure scores for all indices of sustainability reporting to encourage a more sustainability-driven economy, this will indirectly promote economic value added by corporations.

Keywords:

Sustainability reporting, social reporting index, environmental reporting index, economic reporting index, economic value added.

INTRODUCTION

Background to the study

Sustainability reporting is a comparative recent development in corporate financial reporting which enables firms to report the effect of their operations on the general stakeholder group. Corporate performance reporting can however, be said to have emanated with the inception of accounting, separation of business from ownership and heightened by the globalisation of business activities. The annual published financial statement reports serve the purpose of this stewardship reporting. However, periodic

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corporate financial reports contain merely; cash flow statement, statement of changes in equity, statement of profit or loss and statement of financial position. Recently, there has been an extension of the corporate reporting system beyond corporate financial reporting to corporate sustainability reporting. Organizational sustainability reporting is known to have emanated from environmental concerns which triggered environmental reporting some years back (Iliemena, 2020). Further development in economic activities, stakeholder concern and the need for business organizations to look beyond immediate profit further extended the concern to full transition from environmental reporting to sustainability reporting. Increasing attention is being paid to the concept of sustainability reporting because some studies (Gupta & Gupta, 2020; Mahmood & Narbaev 2019) have found that the issues of sustainability greatly affect a firm's

performance, which includes the ability of the company to add economic value. Consequently, various stakeholder groups now demand more corporate transparency which compels companies to sustainability concerns (KPMG, 2008; Ivan, 2009). As pointed out by Global Reporting Initiative (2013), there are basically three aspects of sustainability which are similar to triple bottom line philosophy (social – people, environmental – planet and economic – profit). This is further acknowledged by Jones, Frost, Loftus and Laan (2007), who were of the view that corporate sustainability leaders achieve greater and sustainable value through risk management approaches that derive from social, economic and environmental developments. This can be achieved through sustainability consciousness from the stage of product or service conception in order to gain market reputation for sustainable products and services with an overall advantage of sustainability costs' (social cost, environmental costs and economic costs) reduction and avoidance while adding economic value.

Even in the midst of growing concerns over the years, many firms are yet to fully join the bandwagon for sustainability reporting while already reporting companies are still at cross-roads on the economic relevance of reportage especially as it is still a voluntary affair in most African countries like Nigeria. No firm would want to bear the expenditure associated with sustainability reporting if there is no associated economic return (Murray, 2010). Thus, it becomes necessary to evaluate the effect it has on the ability of a company to add economic value.

Statement of Problem

The increasing need for sustainability reporting has over the years necessitated several researches in the area of sustainability reporting worldwide including; Ngwakwe (2008), Lorri, Jeffrey, Leda and David (2009), Buys, Oberholzer and Andrikopoulos (2011), Adediran and Alade (2013), Norhasimah (2016), etc . Some previous studies that attempted an evaluation of the effects of sustainability reporting focused on abnormal returns and cumulative abnormal returns as measures of performance (Lorraine, Collison & Power, 2004; Jones, Frost, Loftus & Laan, 2007). These culminated into more emphasis on beta (financial risks) and value projections. As markets have become more sophisticated owing to developments over time (Toit, 2015), decisions regarding existing realities need to be made based on evaluation of real economic values emanating from past events otherwise outcomes may be misleading (Goodluck, Iliemena & Islam, 2022), most especially as most past research ignored the aspect of economic value addition. Also, evidence revealed that the relationship between sustainability reporting and measures of firm performance generally, depend highly

on the country in context due to peculiar factors in every country (Caesaria & Basuki, 2017). A lot of studies have been carried out in the context of this study in both Nigeria and other countries but outcome from foreign countries may not be applicable in Nigeria due to the wide economic gap amongst countries. Example; Freedman and Patten (2004) and Lori, Jeffrey, Leda and David (2009) were based in United States of America. Studies of Lorraine, Collison and Power (2004), Yahya and Ghodrattollah (2014), Norhasimah, Habibi, Nor, Sheh and Inalialh (2016), Caesaria & Basuki (2017), Hussain, Rigoni and Orij (2018) were based in United Kingdom. Studies have similarly been carried out in other countries like Pakistan (Ahmad, Waseer, Hussain & Ammara, 2015), Malaysia (Smith, Yahya & Othman, 2007), Tallinn (Natalja & Inna, 2012), China (Weber, 2013), New Zealand (Reddy & Gordons, 2012), Netherland (Wissink, 2012), Indonesia (Burhan & Rahmanti, 2012), etc. There is also need to bring existing Nigerian and none Nigerian based literature up to date as a lot of the extant literature on the variables of study are already out of date (Griffin & Mahon, 1997; Freedman & Patten, 2004; Murray, Sinclair, Power & Gray, 2006; Jones, Frost & Laan, 2007; Smith, Yahya and Othman, 2007; Ngwakwe, 2008; Perez & Sanchez, 2009; Guler, Aslem, & Ozlem, 2010; Burhan & Rahmanti, 2012; Okoye & Ezejiofor, 2013; Aliyu & Noor, 2015; Aondoakaa, 2015; Nollet, Filis, & Mitrokostas, 2016; Nnamani, Onyekwelu & Ugwu, 2017). Considering there have been huge changes in sustainability reporting Guidelines and standard requirements over time (Example; from voluntary disclosure to mandatory disclosure in some countries like United states, United Kingdom, India and China; industry-specific disclosure requirements; the introduction of first reporting standards in 2018 by Global Reporting Initiative; the merging of international organizations like the international Integrated Reporting Council and the Sustainability Reporting Standards Board to strengthen the drive towards sustainability reporting; the introduction of the first Nigerian Guideline on sustainability reporting in 2019; recommendation of sustainability disclosure by the most recent Nigerian code of corporate governance 2018; etc.). These may have affected the pattern of disclosure overtime and the outcome of these past studies, hence, calls for an updated study in the face of G4 general sustainability reporting guideline and standards of the Global Reporting Initiative. Furthermore, a prior review of extant literature revealed that some of the studies that attempted to provide evidence on the effect of sustainability reporting used number of pages of sustainability reports and particular event disclosure to determine reportage or measure

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

effect of sustainability reporting as observed with some previous works could be misleading (Murray, Sinclair, Power & Gray, 2006; Freedman & Patten, 2004). The managements of companies are sometimes at a cross-road in making decisions as to what to report and what not to report in terms of sustainability reporting, this study offers an insight into this decision area and bring out facts on sustainability reporting to help firms make better decisions. This study provides a skeletal sketch to the understanding of the practical realities associated with their decision to maintain sustainability practices. Since sustainability reporting practices has some implied cost, it may interest the practicing firms to know the overall effect on their operations in when measured in terms of economic value added. Also, this current study is necessary for Nigerian policy-makers, especially as Nigeria is yet to have a local sustainability reporting standard and framework. Therefore, an assessment of the practicability of international sustainability reporting standards in the Nigerian economy becomes pertinent and makes this study highly significant.

OBJECTIVE OF THE STUDY

This study aimed to primarily investigate the effect of sustainability reporting on economic value addition of Nigerian listed manufacturing companies engaged in sustainability reporting over the periods 2013 to 2020. This study hopes to contribute to knowledge and make public policy recommendations in this regard by studying these specific objectives; Ascertain the level of effect of economic reporting index on Economic Value Added, Evaluate the extent to which social reporting index affects Economic Value Added, Determine the magnitude of effect, which environmental reporting index has on Economic Value Added.

LITERATURE REVIEW

Sustainability Reporting (SR) and indices of measurement: Global Reporting Initiative [GRI], (2011) viewed SR as a system of reporting which enables the measurement, disclosure and accountability of a company to its internal and external stakeholders with the aim of achieving sustainable development. This is contrary to the view of Wagner and Schaltegger (2004) who defined SR as a system of accounting and reporting involving the recording, analyses and reporting of environmental, social and economic impacts of an economic system. This definition, spells out only three aspects of sustainability reporting. Ecological impacts pointed out by Wagner and Schaltegger (2004) are not clearly distinguishable from environmental impacts. Wagner and Schaltegger (2004) also states that SR is the interaction of links between the three identified aspects of environmental, economic and social impacts.

Similar to the view of Wagner and Schaltegger, Elkington (2004) further viewed SR as comprising a system of accounting and reporting social, economic and environmental issues. Simply put, this definition views SR as the same with Triple bottom line reporting. Sustainability reporting is also described by KPMG (2008) as having the same meaning with triple bottom line reporting, corporate social responsibility reporting and sustainable developed reporting, which are considered subsets of sustainability reporting. As the need for sustainability reporting continued to grow over the years, the meaning of the concept became more robust. Example, Global Reporting Initiative (2014), in later development stated that the sustainability reporting system generates corporate reports that give four basic information regarding the social, economic, governance and environmental performances of organizations from time to time. For the purpose of this particular study, we chose to emphasize on the social, environmental and economic aspects because the governance aspect is not yet so pronounced in GRI-G4. An organization's financial statements and information disclosure is constructed using a recognized framework. Every accounting disclosure has a framework. In this regard, an accounting framework is regarded as a set of published criteria used for the measurement, recognition, presentation, and disclosure of the information in the annual reports of an entity (Accounting Tools, 2018). An SR framework is therefore defined for the purpose of studies on SR, as certain criteria which have been made public for the measurement, recognition, presentation and disclosure of corporate information on economic performance, social performance, environmental performance and governance performance in the financial statement of organizations or in a stand-alone sustainability report. In order words, a sustainability reporting framework gives a skeletal framework to the pattern, content, scope and usefulness of a sustainability reports. At present, Nigeria has no sustainability reporting framework although recently, the Nigerian Exchange Group (NGX) launched a set of SR guidelines in 2019 which further recommends compliance with international guidelines on sustainability reporting. Furthermore, the International Financial Reporting Standards (IFRS) that have been adopted in Nigeria in 2012 and currently in use as accounting standard has no content as to SR. Also, the recently released Nigerian code of corporate governance 2018 only made a recommendation regarding this subject with no specific framework or guideline (NSE, 2018). However, the Nigerian Stock Exchange in an attempt to integrate sustainability reporting as part of the reports for listed companies in Nigeria, issued SR disclosure Guideline in November 2018 (Idigbe, Enadah, Nnamani & Anyadiegwu, 2018), the Guideline itself further encouraged compliance with GRI standards and Guidelines issued from time to time which are internationally accepted. This study

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

therefore focuses on SR practices in relation to the GRI as a globally accepted and applicable guidelines and standards for SR practices. Although the G4 Guidelines have been superseded by the GRI standards which became effective from 1st July 2018, most companies are yet to familiarize themselves with the standard hence, still using the GRI-G4. For the purpose of this study, we computed sustainability reporting indices for the companies based on general sustainability reporting requirement as detailed by GRI. Each element of sustainability reporting has stipulations as to reporting requirements and specific expectation.

Economic Reporting Index (EcoRI):

The aspect of economic reporting in sustainability reporting has to do with the impacts which organizational activities make on the general stakeholders, and the general economic system at both local and global levels. By specific implication, it involves the flow of capital among the corporate stakeholders and its economic impact on the society at large. There are total 9 expected disclosure points under economic reporting. Each reporting firm is expected to report 9/9 (9 out of 9 disclosure requirements) which would give an index of 1. This index is expected to range between 1 and 0. The closer the figure to 1 is the closer to complete reporting or full disclosure. Some past studies have found this method as a reliable way to measure the economic performance level in related researches. Amahalu, Okoye and Obi (2018) adopted this method in computing the values for economic reporting index in a related research that sought to examine the effect of sustainability reporting in the Nigerian business environment. Also, earlier studies by Owolabi, Adetula, Taleatu and Uwuigbe (2016) and Iliemena, Amedu and Uagbale-Ekatak have successfully adopted this method in related studies which motivates the current usage in this study.

Social Reporting Index (SocRI):

The social aspect of SR focuses on the impact of a business organization on the existing social system. This social system includes disclosure regarding labour practices and descent work, social responsibility, human rights and product responsibilities. Disclosures under each of these categories make-up the reporting index depending on the areas and number of items disclosed. There are total 48 expected disclosure points under social reporting. Each reporting company is therefore expected to report 48/48 (48 out of 48) which would give an index of 1. This index is expected to range between 1 and 0. Just as with economic reporting index above, the closer the figure of SocRI to 1 is the closer to complete reporting or full disclosure. Owolabi, Adetula, Taleatu and Uwuigbe (2016) used the GRI: G4 guidelines which have been adopted in this study, in computing the indices for Social reporting aspect of SR in their study. Wissink (2012) also adopted this method in his

earlier study on SR which investigated the relationship between social SR and corporate performance. Other studies that have also adopted this method include Burhan and Rahmanti (2012), Asaolu, Agboola, Ayoola and Salawu (2011), and Appah (2011). Only the study by Lori, Jeffrey, Leda and David (2009) used a contrary method which was the size of the information content of the reports. This study therefore adopted the indices as used by most of the earlier studies.

Environmental Reporting Index (EnvRI):

The area of environmental reporting involves disclosures regarding the impacts which an organization has on the natural systems (water, air and land) and the ecosystems which serve as either input resources (e.g. energy) or output resources (e.g. effluents, wastes and emissions), transport, environmental expenditure, product and service related impacts, environmental compliance and biodiversity as sub-categorized in GRI: G4. The Environmental reporting index of a company depends on the number of items it discloses on its environmental impacts. There are total 34 expected disclosure points under environmental reporting. Each reporting company is expected to disclose 34/34 (34 out of 34 points) which would give an index of 1. This index is expected to range between 1 and 0 (GRI, 2019). The closer the figure of EnvRI to 1 is also the closer to complete reporting or full disclosure. Antara, Putri., Radnadi and Wirawati (2020) in examining the effect of specific variables and environmental performance on SR, used this method in computing SR index. Gupta and Gupta (2020) also adopted this method in their study. This method used successfully and most recently by Iliemena, Amedu and Uagbale-Ekatak (2023) in a related study on SR. Norhasimah, *et al* (2016) had also adopted this method in measuring environmental performance. Hence, it is further adopted in this present study.

Economic Value Added as a measure of performance:

Economic value addition is the ability of a company to create value out of the pool of capital. It is usually indicated in the economic value added by a business from time to time. In determining the ability of a company to add value economically, we measured and identified the economic profit generated by such companies within a period of concern using a criteria known as economic value added (EVA). EVA is a performance measure used to determine the economic profit made by a company from time to time. As noted by Amahalu, Abiahu, Obi and Nweze (2018), EVA measures the value which a company generates from invested fund. This is further supported by the works of Amahalu, Okoye and Obi (2018) and Iliemena and Ijeoma (2019) which further found EVA as the most suitable measure of the performance of a firm when economic factors are being considered. This thus, informs the focus of

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

this study on EVA. EVA enables a company to measure its performance 'based on the residual wealth calculated by deducting its cost of capital from its operating profit, adjusted for taxes on a cash basis' (Stewart, 2000).

EVA = NOPAT – (C * WACC)

EVA = Net Operating profit after tax – (capital invested X Weighted average cost of capital (WACC))/100. **NOPAT** = EBIT X (1 - t): Where; EBIT = Earnings before Interest and Taxes, t = income tax rate in % multiplied by 1/100. EVA in determining the value created by a company considers the risks involved in adding such value and time value of money. As a measure of performance, EVA represents the difference between the earnings realized in an accounting period and the weighted average cost of capital invested in the same accounting period (Iliemena & Ijeoma, 2019). In measuring EVA, when earnings are at least equivalent to the cost of capital then positive EVA is reported which amounts to profit, but when otherwise, it results in negative EVA which similar to business loss and therefore considered as not adding economic value, even if its net profit is positive (Ken & Greg, 2011).

Theoretical view using the Stakeholder Theory (Freeman 1984): The distinctive feature of the stakeholder theory is its concern for multiple stakeholder groups being impacted by a company's operations. According to this theory, a business exists to create economic value for its stakeholder. Going by this theory, a business needs to consider its customers, employees, suppliers, communities and shareholders (Stakeholdermap, 2019). The relevance of this theory to this research lies in its focus on social, economic and economic concerns in business policy formation and administration which forms a basic framework in SR practices and Guidelines. For example, ISO 26000 and GRI which are both sustainability reporting friendly, involve stakeholder analysis (Duckworth & Moore, 2010). The major reason stakeholders are interested in SR is to have knowledge of the level of commitment which a company has in stakeholder concerns. Therefore, a stakeholder conscious company would ordinarily be concerned about the economic, social and environmental impacts of its activities on the respective stakeholder groups. This brings forth the need for sustainability reporting and economic value addition.

Theoretical view using the Agency theory (Jensen & Meckling, 1976): Agency theory is explains the relationship between the principals, such as a shareholder, and agents (business managers). It highlights how the shareholders (investors) pool their resources together and then hires an agent to perform work the work value addition. The principal entrust his resources to the agent without any further participation in the day to day, or month to month businesses. The Agent goes into several financial

transactions on behalf of the principal with the motive of profit and wealth maximization. This study finds the agency theory relevant in explaining the dependent variable (economic value addition) as the theory emphasizes the need for the Agents to take decisions geared towards enhancing the performance of corporate organizations (which includes economic performance) and periodic performance reporting to the Principal . consequently, it is expected that the management of a firm would put in necessary effort and make positive decisions that would maximize the wealth of its owners by economic value addition; hence, the need for corporate sustainability reporting.

Empirical reviews and Gaps: A lot of past studies had been conducted using other measures of performance. Some of the previous works carried out have been reviewed and are discussed below along with their limitations which created the identified gaps that necessitated our current study. Iliemena, Amedu and Uagbale-Ekatak (2023) assessed the effect of environmental sustainability disclosure on both gross profit margin and return on capital employed (ROCE) using a sample of 23 listed companies on Nigerian Exchange (NGX) Group from 2012 to 2021 as content analyses of financial statement and sustainability reports using ex post facto research design. The regression analyses showed that environmental disclosure had no significant effect ROCE while significant positive effect on GPM was recorded. Iliemena (2020) in her study investigated the effect of environmental accounting practices as a dimension of SR on corporate performance of oil and gas companies listed on Nigerian stock exchange from the period 2012 to 2018, using only the accessibility of sustainability reports as performance reportage. The study used turnover, return on capital employed and net profit as measures of performance for the 10 companies that formed the study sample. The result of the regression analysis revealed that environmental accounting practices have positive effect on all measured variables but the effect on net profit was found to be insignificant while the effects on turnover and return on capital employed were respectively found to be significant. The weakness of this study stems from its focus on only environmental aspect of sustainability reporting and its silence on the aspect of economic value measurement. Antara, Putri, Radnadi, and Wirawati (2020) in their study examined the effect of company size, leverage, and environmental performance on SR. Their study used a sample of 8 companies in the LQ45 index using annual reports and sustainability reports for the periods, 2015 to 2018. The results of the multiple linear regression analysis indicated that company size and environmental performance of companies had significant positive effect on SR. Also, the leverage was found not directly influencing SR. As a limitation, the scope of four years as used in this study is considered too small to make a valid conclusion as results;

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

finding may vary over a long period of time. Also, this study also neglected the aspect of economic value addition. Gupta and Gupta (2020) in their paper examined the impact of environmental SR on different measures of performance from Indian perspective. The dimensions used to measure performance were customer performance, internal business process performance, and learning and growth performance. The sample of the study was made up of 200 respondents from senior executive cadre of Indian companies. The methodology used in the study was the confirmatory factor analysis while the association was analyzed using structural equation modeling. Evidence generated indicated that environmental SR has significant positive influence on performance of Indian firms. The major limitation of this study is its focus on only a dimension of SR. Earlier, Orazalin, Mahmood and Narbaev (2019) explored the effect of SR on the financial stability of 45 largest oil and gas companies in Russia trading stock exchange using panel data from 2012 to 2016 reporting periods. Secondary data were used in the study as extracted from sustainability reports and annual reports of the companies under study over the study period. The results showed that the reasons strive for high SR index is to manage risk and achieve financial stability. This study was carried out in Russia and focused on financial stability instead of economic values added. Amedu, Iliemena and Umaigba (2019) examined the value relevance of SR among manufacturing companies in Nigeria in the period 2010 to 2018 using longitudinal research design on a sample of 30 companies. The study hypothesis were tested using regression analyses methodology and findings suggest that economic sustainability has the highest relevance in terms of value followed by social aspect of SR while environmental SR was reported not value relevant. This study as a limitation failed to cover the effect of SR on performance entirely. Adesunloro, Udeh and Abiahu (2019) conducted a study which ascertained the effect of social SR on the performance of Nigerian Breweries plc as a comparative study using descriptive research design. The study sample was made up of 355 respondents while content analyses methodology was used to compare data from Nigerian Breweries and that of First bank Plc, United bank for Africa and Fidelity bank plc. The study employed the t-test statistics in analyzing the data generated in the course of the study and findings revealed among others that Nigerian breweries plc has not significantly disclosed her Social SR information in the periods 2014 to 2017 as compared to the three banks also examined. This study is criticized for its focus on a particular company and its focus on only an aspect of sustainability reporting. In line with the objective of this study, Amahalu, Okoye and obi (2018) examined the effect of sustainability reporting on economic value added using 6 Brewery firms quoted on Nigerian Exchange (NGX) Group as sample of study over some 10 years period ranging from

2008 to 2017. The study measured sustainability reporting also using economic, environmental and social reporting indices. Secondary data were used in the study as sourced from corporate annual reports and NGX publications and the data were analysed using correction co-efficient and multiple regression. Evidence showed all chosen measures of sustainability have significant positive effect on EVA. However, the use only 6 samples for generalizing is flawed by this study. Also, the scope of the study covered periods before standardization of sustainability reporting and then ended as far back as 2017. Hence, it creates a gap which future studies need to fill which informs our scope of study. Going further, Norhasimah *et. al* (2016) investigated the effect of environmental disclosure on financial performance of public limited liability companies in Malaysia using a sample of 100 companies. Results from the study revealed a significant relationship between environmental disclosure (EnvRI) and profit margin. This study was based in Malaysia; the result may therefore be different from what is obtainable in Nigeria. An additional limitation of this study is its focus on only an aspect of SR. Also, Owolabi, Adetula, Taleatu, and Uwuigbe (2016), conducted a study into the assessment of SR practices of Lafarge Africa plc using content analyses on annual reports and the GRI G4 Guidelines on SR. Evidence gathered revealed that there was no disclosure on issues relating to human rights, very poor environment SR disclosure (3%), and a total SRI of 30% based on the indicators used in their study. This study even though was based in Nigeria, is considered a case study as it only focused on a company and findings cannot be generalized.

Further in Nigeria, a similar study conducted by Okoye and Ezejiofor (2013) examined the relationship between Environmental SR and performance using the opinion of 25 respondents from finance sections of two companies in Nigeria (Innoson Nigerian Plc and Nigerian Bottling company Plc). Correlations analysis methodology was used in analyzing the data gathered and evidence showed significant relationship between Environmental aspect of SR and increase in firm productivity, economic growth and performance. The small sample nature of this study and the use of primary data pose a constraint to its reliability and general applicability. In the distant past, Wissink (2012) investigated the relationship existing between social SR and corporate performance with evidence emanating from Netherlands. The result of the correlation analysis employed in the study showed a positive relationship social SR and corporate performance. This study is criticized for its focus on only an aspect of sustainability reporting. Also, Lori, Jeffrey, Leda and David (2009) examined the social SR practices of 50 listed firms in United States of America through content analyses to determine the effect of size on information content. Evidence gathered showed that the size of the reports affects the information content in the

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

aspect of social SR. As the study was based in U.S., the outcome may not be applicable in Nigeria especially as most companies in Nigeria are yet to be fully acquainted with the disclosure specifics. Lastly, Ngwakwe (2008) carried out a research in Nigeria which aimed to evaluate the relationship between sustainable business practices of corporate organizations and the performance of 60 listed manufacturing companies using field survey methodology. Findings from the study revealed SR practices of companies have a significant positive relationship with their performance. This study was carried out in 2008 before the introduction of the GRI: G4 and the sustainability reporting standards currently in use. Hence, it is considered out of date and result may not be the same when re-examined in the current realities.

MATERIALS AND METHOD

This study employed “*ex-post facto*” research design, as the researcher examined past events which the researcher cannot change or alter. The Population of study was made-up of 73 manufacturing companies only, in three basic sectors: industrial goods firms, oil and gas firms and consumer goods firms, quoted on the Nigerian Exchange Group (NGX) as at 21st February 2019 (see appendices) in the following categories: Industrial Goods -34, Oil and gas -13, and Consumer goods -26. However, Judgmental sampling yielded **37 companies** used as the sample of study with full details disclosed in appendices. The sample criteria included; NSE market presence within the study scope of 2013-2020, availability of both annual reports and sustainability reports within the period and 31st December as end of accounting period.

This study therefore utilized only secondary data from documentations from the United Nations (UN) Global Compact Initiative’s libraries, NSE Fact books (only where financial statement is not accessible online), the NSE libraries, annual financial statements of companies and sustainability reports of companies that published stand alone sustainability reports within the period under study.

The indices were based on number of indicators under each reporting requirements as a denominator of number of items actually reported whether qualitatively or quantitatively reported.

1 point for reporting of each indicator

0 point for non-reporting of each indicator

The total point for each SR component disclosure depends on the number of disclosure items required by the GRI Guidelines and standards. The SRI for a company is determined as the average indexes for economic, social, and environmental reporting. Sustainability Reporting Index = (Total Economic Reporting points + Total Social Reporting Points + Total Environmental Reporting Points + total Governance Reporting points)/ Total Indicator Points. For the purpose of emphasis, each indicator was assigned 1 point when reported in either the standalone sustainability reports or the annual financial statement while 0 point was marked where no reporting of a particular indicator was observed. The total point is the addition of all 0 and 1 as observed. SR index for each of economic, social and environmental reporting were then measured as the sum of the points for each company as a ratio of the total number of assessment item under each of the three categories of SR. The reporting requirements under each component, ratings and indicators are specified below as contained in GRI: G4-part 2 for the purpose of reference. The panel data gathered for the study were subjected to empirical tests using panel regression techniques as shown in the below tables.

ANALYSIS AND DISCUSSIONS

This study examines the effect of three aspects of sustainability reporting on economic value addition of Nigerian listed manufacturing companies from 2013 to 2020. The data analysed in the study are presented in Appendix 4. Sustainability reporting is represented by economic reporting index (EcoRI), social reporting index (SocRI) and environmental reporting index (EnvRI), while the effect of sustainability reporting on economic value addition is controlled by firm age in this study.

Table 1 Descriptive Analysis

	EVA	ECORI	SOCRI	ENVRI	AGE
Mean	110.1310	0.846471	0.644810	0.680088	26.71622
Maximum	864.1500	0.888889	0.958333	0.941176	48.00000
Minimum	-1622.450	0.555556	0.441667	0.516471	5.000000
Std. Dev.	177.6183	0.077030	0.122958	0.105604	12.09288
Jarque-Bera	11752.54	192.4426	60.96992	166.6564	17.57699
Probability	0.000000	0.000000	0.000000	0.000000	0.000152
Observations	296	296	296	296	296

The descriptive statistical analysis of the data was obtained by the use of mean, range values, standard deviation, Jarque-Bera, and the Probability of Jarque-Bera. In line with the results in table 1 above, EVA averaged 110.13 from

2013 to 2020 with a standard deviation of 177.62. This implies that the economic value addition of Nigerian listed manufacturing companies over the period in view was not relatively the same: some firms added extremely high

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

economic values while some added extremely low economic values. This position was equally supported by the minimum and maximum values of EVA, -1622.45 and 864.15, respectively. In addition, the probability of Jarque-Bera for EVA (0.000) shows the presence of outliers in the data for the economic value addition of Nigerian listed manufacturing companies from 2013 to 2020.

Data on EcoRI showed that the proportion of economic reporting indices disclosed by the firms on average was 84.65%. The firm with the highest disclosure of economic reporting index scored 88.89% while the firm with the least disclosure of economic reporting scored 55.56%. Also, the probability of Jarque-Bera for EcoRI (0.000) shows the presence of outliers in the data for the economic reporting indices of Nigerian listed manufacturing companies from 2013 to 2020.

Data on SocRI showed that the proportion of social reporting indices disclosed by the firms on average was 64.48%. The firm with the highest disclosure of social reporting index scored 95.83% while the firm with the least disclosure of social reporting scored 44.17%. Also, the probability of Jarque-Bera for EcoRI (0.000) shows the presence of outliers in the data for the social reporting indices of Nigerian listed manufacturing companies from 2013 to 2020.

Data on EnvRI showed that the proportion of environmental reporting indices disclosed by the firms on average was 68%. The firm with the highest disclosure of environmental reporting index scored 94.12% while the firm with the least disclosure of environmental reporting scored 51.65%. Also, the probability of Jarque-Bera for EcoRI (0.000) shows the

presence of outliers in the data for the environmental reporting indices of Nigerian listed manufacturing companies from 2013 to 2020.

On average, the sampled firms have existed for more than 26 years. The standard deviation for firm age which is 12.09 indicates that there are firms with much more years of existence than others. That is, the firm age distributions of the firms are not homogenous. The youngest firm has been in existence for 5 years while the oldest firm has existed for 48 years. Finally, the probability of Jarque-Bera for Age (0.0000) shows the presence of outliers in the ages of Nigerian listed manufacturing companies from 2013 to 2020.

Model Specification Tests

Hausman Specification Test

The nature of the data used in this study is panel structure, which therefore required a panel approach of estimations. Three regression models that were used to estimate the regression coefficients of the effect of sustainability reporting on economic value addition were Fixed Effect Model, Random Effect Model and pooled OLS. The essence of the panel estimation technique is to take into consideration the dependency of unobserved predictors on the explanatory variable. First, we discriminated between the Fixed Effect Model and Random Effect Model using Hausman Specification Test, of which result is presented below.

Table 2 Correlated Random Effects - Hausman Test

Equation: A_REM

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.985441	4	0.2888

The null hypothesis of Hausman Specification Test is that the regressors do not depend on the individual specific-effects. This is basically the assumption of a random effect. In a case where the Hausman Specification Test shows otherwise, the alternate hypothesis is accepted and Fixed Effect Model is consequently applied. As per the results in **table 2**, the *p-value* = 0.2888 implies that we fail to reject the null hypothesis and thus conclude that the regressors do not depend on the individual specific-effects. The

consequence of this conclusion is the use of Random Effect Model of estimation.

Lagrange multiplier (LM) test for panel data

Having selected Random Effect Model in place of Fixed Effect Model, there is need to also check the presence of random effect in the model. Thus, we applied the Lagrange multiplier (LM) test for panel data to discriminate between the use of common effect model or random effect model. The results are presented in **table 3** below.

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

Table 3: Lagrange multiplier (LM) test for panel data

Date: 12/10/22 Time: 23:12

Sample: 2013 2020

Total panel observations: 296

Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	4.764620 (0.0291)	1.580815 (0.2086)	6.345435 (0.0118)
Honda	2.182801 (0.0145)	-1.257305 (0.8957)	0.654425 (0.2564)

The null hypothesis of a Lagrange multiplier (LM) test is that there is no random effect while the alternate hypothesis is that random effect is present. Failure to reject the null hypothesis would mean that common effect model would be used. In the result presented in **table 3** above, the alternate hypothesis that random effect is present was accepted because the *p*-value for cross-section one-sided (0.0291) is less than 0.05. Thus, the Random Effect Model is the most

appropriate model for the estimation of the effect of sustainability reporting on economic value addition of Nigerian listed manufacturing companies. Although the result of the OLS and Fixed Effect Model are presented in Appendix 5, only the results of the Random Effect Model are interpreted since this is the most accurate model for the study.

Table 4: Model Estimation Using Random Effect Approach

Dependent Variable: EVA

Method: Panel EGLS (Cross-section random effects)

Date: 12/10/22 Time: 22:55

Sample: 2013 2020

Periods included: 8

Cross-sections included: 37

Total panel (balanced) observations: 296

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-581.5985	141.9644	-4.096791	0.0001
ECORI	408.7010	131.4785	3.108502	0.0021
SOCRI	436.7271	116.9052	3.735736	0.0002
ENVRI	71.68873	135.2108	0.530200	0.5964
AGE	0.576990	0.991870	0.581719	0.5612
Effects Specification				
			S.D.	Rho
Cross-section random			46.40126	0.0759
Idiosyncratic random			161.8825	0.9241
Weighted Statistics				
R-squared	0.121707	Mean dependent var		85.54835
Adjusted R-squared	0.109635	S.D. dependent var		171.8501
S.E. of regression	162.1563	Sum squared resid		7651750.
F-statistic	10.08116	Durbin-Watson stat		1.751128

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

Prob(F-statistic) 0.000000

Unweighted Statistics			
R-squared	0.111366	Mean dependent var	110.1310
Sum squared resid	8270282.	Durbin-Watson stat	1.620161

The R-squared value of 0.121707 shown in **Table 4** implies that about 12.17% variations in EVA were explained by the systematic variance in EcoRI, SocRI, EnvRI and firm age. Penalizing for the addition of statistically insignificant predictor(s), the Adjusted R-squared value of 0.109635 implies that only about 10.96% variations in EVA were accounted for by the relevant predictors. General, the overall goodness-of-fit of the model is significant since the F-statistic = 10.08116 had a corresponding Prob(F-statistic) = 0.0000. On this note, this model which regressed EVA on the joint interaction among EcoRI, SocRI, EnvRI and firm age is better than a zero-coefficient model.

In addition, the Durbin-Watson stat value of 1.751128 shows the absence of autocorrelation since the statistic falls between the acceptable margins of 1.50 to 2.50. The control variable exerted no significant influence on the model since its *p*-value = 0.5612 is greater than 0.05. The large standard errors imply that the sample means for EcoRI, SocRI and EnvRI do not fittingly represent the population mean for the variables. This limitation was as a result of the varying levels of sustainability reporting practices adopted by the firms. These standard errors also show the heterogeneity in the EcoRI, SocRI and EnvRI of listed manufacturing firms in Nigeria.

Hypotheses Testing

The hypotheses of the study are tested using the coefficients, *t*-values, and *p*-values presented in **table 4** above.

Hypothesis I

Economic reporting index has no significant effect on the Economic Value Added of Nigerian listed manufacturing companies.

The coefficient of EcoRI in **Table 4** is 408.7010, which implies that economic reporting index has a positive effect on the Economic Value Added of Nigerian listed manufacturing companies. In other words, a marginal increase in EcoRI would result in an increase in EVA by 408.7. This positive effect is statistically significant since the *p*-value of EcoRI = 0.0021 is less than 0.05. Thus, we reject the null hypothesis and conclude that Economic reporting index has a significant positive effect on the Economic Value Added of Nigerian listed manufacturing companies ($\beta = 408.7010$, *p*-value = 0.0021). Amedu, Iliemena and Umaigba (2019) examined the value relevance of SR among manufacturing companies in Nigeria and findings suggest that economic sustainability has the highest

relevance in terms of value. The theoretical viewpoint of the Agency theory is in line with this outcome. The management being in a position to administer corporate resources invests in activities that create economic value for the benefit of shareholders. This was also our apriori expectation as unit increase in economic performance is expected to yield a unit increase in economic value added. Other studies that are in agreement with this outcome include Amahalu, Okoye and Obi (2018), Iliemena, Amedu and Uagbale-Ekatah (2023), Iliemena and Ijeom (2019) and Amahalu, Abiahu, Obi and Nweze (2018). Contrary to the above, Buys, Oberholzer and Andrikopoulos (2011) found no definite positive effect of Sustainability Reporting on economic performance of firms.

Hypothesis II

Social reporting index has no significant effect on the Economic Value Added of Nigerian listed manufacturing companies.

The coefficient of SocRI in **Table 4** is 436.7271, which implies that social reporting index has a positive effect on the Economic Value Added of Nigerian listed manufacturing companies. In other words, a marginal increase in SocRI would result in an increase in EVA by 436.7. This positive effect is statistically significant since the *p*-value of SocRI = 0.0002 is less than 0.05. Thus, we reject the null hypothesis and conclude that Social reporting index has a significant positive effect on the Economic Value Added of Nigerian listed manufacturing companies ($\beta = 436.7271$, *p*-value = 0.0002). This result also aligns with our theoretical postulation that the shareholders will take such decisions that would increase shareholders' wealth, hence, social sustainability performances. Earlier and in line with our result here, Wissink (2012) investigated the relationship existing between social SR and corporate performance and found a positive relationship between social SR and corporate performance. Amedu, Iliemena and Umaigba (2019) examined the value relevance of SR among manufacturing companies in Nigeria and findings suggest that social aspect of sustainability has the second highest value- relevance after economic sustainability reporting. However, contrary to our finding, Adesunloro, Udeh and Abiahu (2019) conducted a study which ascertained the effect of social SR on the performance and found no significant effect.

Hypothesis III

Environmental reporting index has no significant effect on Economic Value Added of Nigerian listed manufacturing companies.

The coefficient of EnvRI in **Table 4** is 71.68873, which implies that environmental reporting index has a positive effect on the Economic Value Added of Nigerian listed manufacturing companies. In other words, a marginal increase in EnvRI would result in an increase in EVA by 71.68873. This positive effect is not statistically significant since the p -value of EnvRI = 0.5964 is greater than 0.05. Thus, we fail to reject the null hypothesis and conclude that Environmental reporting index has a no significant positive effect on the Economic Value Added of Nigerian listed manufacturing companies ($\beta = 71.68873$, p -value = 0.5964). This somehow contradicts with our proposed theory and somewhat also in agreement. However, in disagreement with this outcome, Okoye and Ezejiofor (2013) examined the relationship between Environmental SR and performance and showed significant relationship between Environmental aspect of SR and increase in firm productivity, economic growth and performance. Iliemena (2020) in her study investigated the effect of environmental accounting practices as a dimension of SR on corporate performance and found that environmental accounting practices have significant positive effect on measures of corporate performance. This is further somewhat in line with Amedu, Iliemena and Umaigba (2019) which found environmental sustainability reporting to be non-value relevant. This difference in outcome could have emanated from sample size, or scope covered at the time of the study. However, Antara, Putri, Radnadi, and Wirawati (2020) indicated that environmental performance of companies had significant positive effect on SR. Gupta and Gupta (2020) in their paper that examined the impact of environmental SR on different measures of performance indicated in contradiction with our result, that environmental SR has significant positive influence on performance of Indian firms. Norhasimah, *et al* (2016) also investigated the effect of environmental disclosure on financial performance of public limited liability companies and reported a significant relationship between environmental disclosure (EnvRI) and corporate performance.

Overall, the regression results of the study as shown in hypothesis tests 1 – III showed that sustainability reporting, controlled by firm age, has a significant positive effect on Economic Value Added of Nigerian listed manufacturing companies. This implies that sustainability reporting has a significant positive effect on EVA. The result is in consonance with our a priori expectation which expected that a unit increase in SR will yield corresponding increase in financial performance.

CONCLUSION AND RECOMMENDATIONS

The three selected measures of sustainability reporting (economic reporting index, social reporting index and environmental reporting index) all had positive effect on economic values added within the period 2013 – 2020, even though the effect of environmental reporting index was not significant. This implies that as sustainability reporting indices increased over the years, the economic values added by the reporting companies over the years increased simultaneously, and vice versa. This study therefore concludes that SR has significant positive effect on economic value added and recommends as follows:

- 1) All business organizations should incorporate sustainability reporting in their reporting system to reap the associated benefit in economic value added.
- 2) The Financial Reporting Council of Nigeria should take a step forward to the standardization of Sustainability reporting for uniform standard of reporting among Nigerian companies and good atmosphere for greater level of economic value addition by companies.
- 3) Government should put in place annual awards and recognition programmes for firms with highest disclosure scores for sustainability reporting to encourage a more sustainability-driven economy. This will indirectly promote economic value addition by corporations.

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Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

APPENDICES

Appendix 1: Population List and relevant information for sample selection (manufacturing companies listed on NSE according to sector)

Oil and Gas companies	year of incorporation	year of NSE listing	End of accounting period
1. 11 plc (Mobil)	1951	1991	31 st December
2. Anino international	1981	1990	- *
3. Capital oil	1985	1990	31 st December
4. Caverton offshore support	2008	2008	31 st December
5. Conoil		1989	31 st December
6. Eterna	1991	1998	31 st December
7. Forte oil	1978	1978	31 st December
8. Japaul oil and maritime services	1994	- *	31 st December
9. Mrs oil Nigeria	1969	1978	31 st December
10. Oando	1969	1992	31 st December
11. Rak unity petroleum	1982	1989	31 st December
12. Seplat petroleum development	2009	2014*	31 st December
13. Total Nigeria	1956	2001	31 st December
Industrial companies			
1. A.G. Leventis	1937	1978	31 st December
2. Academy press	1964	1995	31 st march*
3. Austin Laz and company	1982	- *	31 st December
4. Beta glass co	1974	1986	- *
5. C &I leasing	1991	1997	- *
6. Cement company of Northern Nigeria			1993 31 st December
7. Chellarams	1947	1977	31 st march*
8. Cutix	1982	1987	30 th April *
9. Dangote cement	1981	2008	31 st December
10. Global spectrum energy services	2006	- *	
11. Greif Nigeria	1940	1979	31 st October *
12. Interlinked technologies	1981	1993	30 th June *
13. John Holt	1897	1974	30 th September*
14. Julius Berger Nigeria	1970	1991	31 st December
15. Lafarge Africa			1979 31 st December
16. Red star express	1992	2007	31 st march *
17. Roads Nigeria *	1974	1979	31 st December
18. SCOA Nigeria	1969	1977	31 st December
19. Skyway aviation handling	2009	- *	
20. Studio Press Nigeria		1979	31 st march *
21. The Initiates	1995	2016 *	-
22. Trans-nationwide express	1984	1993	31 st December
23. Triple Gee and co.	1980	2013	31 st march *
24. UAC of Nigeria	1929	1977	- *
25. Aluminum extrusion industry	1982	1986	31 st December
26. B.O.C Gases	1959	1979	30 th September *
27. Berger paints	1959	1974	31 st December
28. CAP	1965	1979	31 st December
29. Meyer	1940	1979	31 st December
30. Multiverse	2002	2008	31 st December
31. Notore chemical industries	2005	- *	
32. Portland paints and product Nigeria	1985	2009	31 st December

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

33. Premier paints	1982	1995	31 st December
34. Thomas Wyatt Nigeria	1948	1978	- *

Consumer Goods Companies

1. Cadbury Nigeria	1965	1976	31 st December
2. Champion Breweries	1974	1983	31 st December
3. Dangote Flour Mills	1999	2008	30 th September *
4. Dangote Sugar Refinery	2005	2007	31 st December
5. Ellah Lakes	1980	1993	31 st July *
6. Flour Mills Of Nigeria	1960	1979	31 st march*
7. Ftn Cocoa Processor		2008	31 st December
8. Golden Guinea Breweries	1962	1979	31 st march *
9. Guinness Nigeria	1950	1965	30 th June *
10. Honeywell Flour Mills	1996	2009	31 st December
11. International Breweries	1971	1995	31 st December
12. Livestock Feeds	1963	1978	31 st march *
13. McNichols	2004	2009	31 st December
14. Morison Industries	1955	1978	31 st December
15. Multi-Trex Integrated Foods	1999	2010	30 th April *
16. Nascon Allied Industries	1973	1992	31 st December
17. Nestle Nigeria	1961	1979	31 st December
18. Nigerian Breweries	1946	1973	31 st December
19. Nigerian Enamelware	1960	1979	31 st April *
20. Northern Nigeria Flourmills	1971	1978	31 st march *
21. Okomu Oil Palm	1979	1991	31 st December
22. Presco	1991	2002	31 st December
23. Pz Cussons Nigeria	1948	1974	31 st may *
24. Unliver Nigeria	1923	1973	31 st December
25. Union Dicon Salt	1984	1993	31 st March*
26. Vitafoam Nigeria	1962	1978	30 th September *

The companies with asterisks did not meet all relevant criteria.

Appendix 2: Sectored Sample extract of companies that possess first and second sample criteria.

Oil and Gas companies

1. 11 plc (Mobil)
2. Capital oil
3. Caverton offshore support
4. Conoil
5. Eternal
6. Forte oil
7. Mrs oil Nigeria
8. Oando
9. Rak Unity petroleum
10. Total Nigeria

Industrial companies

11. Cement company of northern Nigeria
12. Dangote cement
13. Julius Berger Nigeria
14. Lafarge Africa

15. Roads Nigeria*
16. SCOA Nigeria
17. Trans-nationwide express

Consumer Goods Companies

18. Aluminium extrusion industry
19. Berger paints
20. CAP
21. Meyer
22. Multiverse
23. Portland paints & products Nigeria
24. Premier paints
25. Cadbury Nigeria
26. Champion breweries
27. Dangote sugar refineries
28. FTN Cocoa processor
29. Honey well flour mills
30. International breweries

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

- | | |
|------------------------------|----------------------|
| 31. MCNichols | 36. Okomu oil palm |
| 32. Morison industries | 37. Presco |
| 33. Nascon Allied industries | 38. Unilever Nigeria |
| 34. Nestle Nigeria | |
| 35. Nigerian Breweries | |

The asterisked company here failed to meet the 3rd and 4th sampling criteria, hence, we dropped it and 37 qualified companies continued with as sample of study.

Appendix 3: Computation of company ages based on qualified companied in appendix 2 from 2013-2020

S/N	COMPANY NAME	YEAR OF IPO	2013	2014	2015	2016	2017	2018	2019	2020
1	11 plc (Mobil)	1991	23	24	25	26	27	28	29	30
2	Capital oil	1990	24	25	26	27	28	29	30	31
3	Caverton offshore support	2008	6	7	8	9	10	11	12	13
4	Conoil	1989	25	26	27	28	29	30	31	32
5	Eternal	1998	16	17	18	19	20	21	22	23
6	Forte oil	1978	36	37	38	39	40	41	42	43
7	Mrs oil Nigeria	1978	36	37	38	39	40	41	42	43
8	Oando	1992	22	23	24	25	26	27	28	29
9	Rak Unity petroleum	1989	25	26	27	28	29	30	31	32
10	Total Nigeria	2001	13	14	15	16	17	18	19	20
11	Cement company of northern Nigeria	1993	21	22	23	24	25	26	27	28
12	Dangote cement	2008	6	7	8	9	10	11	12	13
13	Julius Berger Nigeria	1991	23	24	25	26	27	28	29	30
14	Lafarge Africa	1979	35	36	37	38	39	40	41	42
15	SCOA Nigeria	1977	37	38	39	40	41	42	43	44
16	Trans-nationwide express	1993	21	22	23	24	25	26	27	28
17	Aluminium extrusion industry	1986	28	29	30	31	32	33	34	35
18	Berger paints	1974	40	41	42	43	44	45	46	47
19	CAP	1979	35	36	37	38	39	40	41	42
20	Meyer	1979	35	36	37	38	39	40	41	42
21	Multiverse	2008	6	7	8	9	10	11	12	13
22	Portland paints & products Nigeria	2009	5	6	7	8	9	10	11	12
23	Premier paints	1995	19	20	21	22	23	24	25	26
24	Cadbury Nigeria	1976	38	39	40	41	42	43	44	45
25	Champion breweries	1983	31	32	33	34	35	36	37	38
26	Dangote sugar refineries	2007	7	8	9	10	11	12	13	14
27	FTN Cocoa processor	2008	6	7	8	9	10	11	12	13
28	Honey well flour mills	2009	5	6	7	8	9	10	11	12
29	International breweries	1995	19	20	21	22	23	24	25	26
30	MCNichols	2008	6	7	8	9	10	11	12	13
31	Morison industries	1978	36	37	38	39	40	41	42	43
32	Nascon Allied industries	1992	22	23	24	25	26	27	28	29
33	Nestle Nigeria	1979	35	36	37	38	39	40	41	42
34	Nigerian Breweries	1973	41	42	43	44	45	46	47	48
35	Okomu oil palm	1991	23	24	25	26	27	28	29	30
36	Presco	2002	12	13	14	15	16	17	18	19
37	Unilever Nigeria	1973	41	42	43	44	45	46	47	48

Iliemena, Rachael Okwudili et al, Sustainability Reporting and Economic Value Added: Empirical Evidence from Listed Manufacturing Entities in Nigeria

Appendix 4: Other Regression Results

Fixed Effect Model Estimation

Dependent Variable: EVA

Method: Panel Least Squares

Date: 12/10/22 Time: 22:54

Sample: 2013 2020

Periods included: 8

Cross-sections included: 37

Total panel (balanced) observations: 296

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-585.1837	175.1345	-3.341338	0.0010
ECORI	324.2101	143.2847	2.262699	0.0245
SOCRI	504.7787	127.3568	3.963501	0.0001
ENVRI	71.36916	143.2658	0.498159	0.6188
AGE	1.753852	4.128339	0.424832	0.6713

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.281970	Mean dependent var	110.1310
Adjusted R-squared	0.169338	S.D. dependent var	177.6183
S.E. of regression	161.8825	Akaike info criterion	13.13955
Sum squared resid	6682512.	Schwarz criterion	13.65071
Log likelihood	-1903.653	Hannan-Quinn criter.	13.34421
F-statistic	2.503460	Durbin-Watson stat	2.014883
Prob(F-statistic)	0.000009		

Random Effect Model estimation

Dependent Variable: EVA

Method: Panel Least Squares

Date: 12/10/22 Time: 22:41

Sample: 2013 2020

Periods included: 8

Cross-sections included: 37

Total panel (balanced) observations: 296

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-587.6667	142.9596	-4.110720	0.0001
ECORI	442.1965	130.8631	3.379076	0.0008
SOCRI	407.7047	116.0421	3.513420	0.0005
ENVRI	67.26516	136.2049	0.493853	0.6218
AGE	0.555938	0.811526	0.685053	0.4939

R-squared	0.112194	Mean dependent var	110.1310
Adjusted R-squared	0.099991	S.D. dependent var	177.6183
S.E. of regression	168.5043	Akaike info criterion	13.10855
Sum squared resid	8262568.	Schwarz criterion	13.17088
Log likelihood	-1935.065	Hannan-Quinn criter.	13.13351
F-statistic	9.193617	Durbin-Watson stat	1.623229
Prob(F-statistic)	0.000001		