EFFECT OF FIRM CHARACTERISTICS ON SUSTAINABILITY REPORTING OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

This study examines the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria. The population comprises 56 quoted manufacturing firms in Nigeria while all the population was sampled using the census method covering the periods of 2009 to 2019. The data were analyzed using independent observations test, variance inflation factor test while logistic regression model was used to test the formulated null hypotheses. The results show that profitability has a significant positive effect on corporate sustainability reporting of quoted manufacturing firms in Nigeria for the period under review while leverage has an insignificant negative effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria. The study recommends that the management of manufacturing firms in Nigeria should maintain a low financial leverage level to increase the level of disclosure of their corporate sustainability reporting in Nigeria. Also, the management of manufacturing firms in Nigeria should strategies in ways of cost control mechanism to increase their profits to further enhance the level of their corporate sustainability reporting in Nigeria.

Keywords: *Firm Characteristics, Sustainability Reporting, Manufacturing Firms*

Introduction

Sustainability reporting has emerged as a powerful tool in gaining long term business growth and competitive advantage. The practice to report high-quality non-financial data beyond the financial bottom line helps companies to mitigate the potentially material financial impact of environmental and social risk in their businesses. In May 2013, the non-mandatory G4 Sustainability Reporting Guidelines was initiated to commensurate the need for a more relevant, transparent and credible integration of sustainability indicators into sustainability reporting practices. Non-financial corporate performance has begun to capture the attention of an increasing number of investment professionals as they realize that profitability alone is not sufficient for a firm's long-term growth. By looking beyond economic, strategic and operational factors to include environmental and social considerations, sustainability reporting helps boost corporate transparency, strengthen risk management, promote stakeholder engagement and improve communications with stakeholders. In Nigeria, the Nigerian Code of Corporate Governance (2011) released by the Nigerian Securities and Exchange Commission (SEC) emphasized this in Part D under Sustainability Issues [Paragraph 28.1 and 28.3(a) to (i)]. Paragraph 28.3 specifically states that the Board should report annually on the nature and extent of its social, ethical, safety, health and environmental policies and practices" (2011 SEC Code). The most widely accepted sustainability disclosure standard is the Global Reporting Initiative (GRI) with the latest version issued in 2016 by Global Sustainability Standards Board (GSSB). This guideline recognizes disclosure based on the Triple Bottom Line reporting (mega reporting) principle with disclosures on economic, environmental and social issues otherwise referred to as the Triple P (profit, planet and people).

Adhipradana (2014) asserts that the disclosure of sustainability reports is increasingly gaining attention in global business practices, improving financial performance and building corporate legitimacy adding that sustainability reporting can be used by investors to assess the performance of a company that is not only measured by the annual report. A company can be deemed as having sustainability reporting if there is a compiled and published report which disclosed environmental and social besides having reported on governance and economic activities. In the management science literature, the concept of corporate sustainability refers to the ability of the company to create value and continue working over a long period (Perrini & Tencati, 2006). Sawani, et al (2010) pointed out that companies publish sustainability initiatives in the form of sustainability reports, which is considered an integral part of the communication process between business enterprises and the various stakeholders to their advantage in the society.

Firm leverage can be described as the component of a company's capital that is financed through debts. Amir *et al*. (2018) pointed out that a firm is described as leveraged when it is financed partly by long term debts, adding that, leverage measures the extent of the borrowed financial resources used in a firm. Leverage affects the quality of financial reports issued by companies because it is a sign of the wellness of the firm in terms of internal resources management. It, therefore, follows that a higher leverage rate means that the company is operating more on borrowed funds which in itself is bad news and management would not voluntarily report such situations. Management of low leverage firms will usually be happy to fully disclose their sustainability reports in other to show that they care for the environment and society (Susandya, et al, 2018). In a related development, the profitability of a firm refers to the ability of a company or business to make an excess of income over expenditure and is the reason why businesses are set up. The amount of profit a company can generate will influence the commitment it can make in helping to replenish the damages its activities are having on the environment through its social responsibility programmes and would naturally be happy to undertake sustainability reporting.

The disclosure of sustainability reports is increasingly gaining attention in global business practices and can also improve financial performance and build corporate legitimacy. It can be used by investors to consider whether it is appropriate to invest in assessing the performance of a company that is not only measured by the annual report but also can be seen from the company's sustainability reports. The profitability level of manufacturing firms is another important mechanism that determines the level of sustainability reporting because profitable firms will likely disclose more sustainability reporting than firms that are not making a profit, therefore, this will be examined. Also, the leverage level of manufacturing firms equally determines the level of sustainability reporting which need to be examined.

From the available literature, scholars are still very divergent on the impact of firm characteristics on the extent and level of sustainability reporting worldwide. This lack of agreement calls for more studies to be conducted in this area thereby creating a space to which this study keys. The empirical works of Onyinye and Amakor (2019), Amir *et al*. (2018), Tong (2017) and Modugu and Eboigbe (2017), Marko and Stephanie (2014) have shown that some of the studies used weaker statistical tools of ordinary least square regression technique for their data analysis instead of binary regression technique which affects the reliability of their findings. In a related development, the empirical works of Miaad (2020) and Onyinye and Amakor (2019) carried out in recent times of 2019/2020 regarding the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria and other countries of the world were not current in their data used for the analysis as all their data were within 2017 and below.

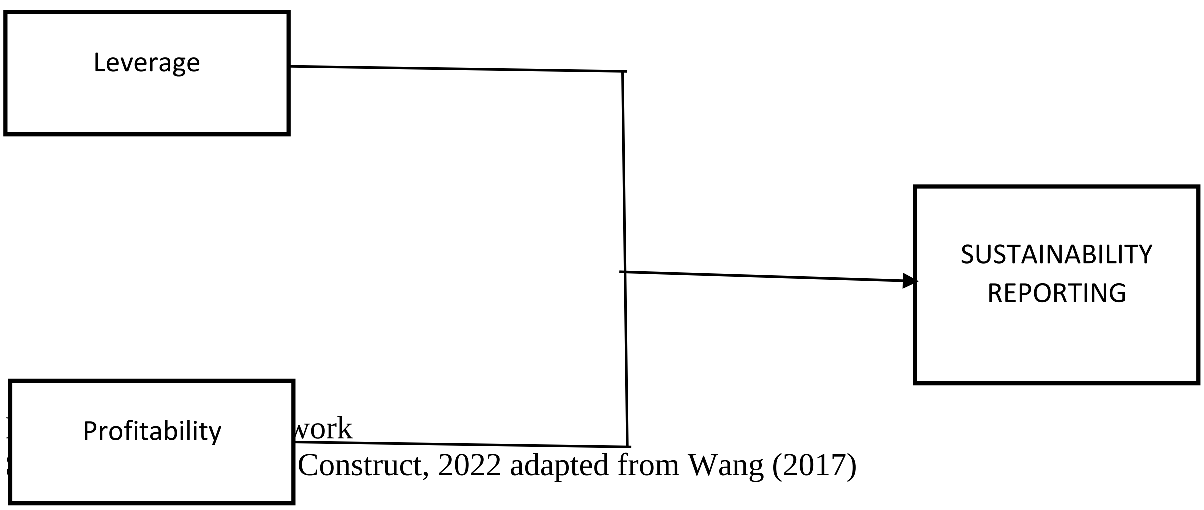
Furthermore, these kinds of studies conducted in Nigeria were very scanty while most of these studies were done in other countries of the world. These gaps in literature call for further study in this area which necessitated this study the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria, to update the data up to 2019, using panel regression technique, and add to the scanty literature in this area in Nigeria.

The main objective of this study is to evaluate the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria, while the specific objectives are to: (i) investigate the effect of firm leverage on sustainability reporting of manufacturing firms listed in Nigeria; and (ii) assess the effect of profitability on sustainability reporting of manufacturing firms listed in Nigeria. To achieve the above stated specific objectives, the null hypotheses were formulated: $H_{O}1$: Firm leverage has no significant impact on sustainability reporting of manufacturing firms listed in Nigeria; and $H_{O}2$: Profitability has no significant impact on sustainability reporting of manufacturing firms listed in Nigeria.

Literature Review

Conceptual Framework

The conceptual framework of this study comprises firm characteristics represented by leverage (LEVRG), profitability (PROF) and sustainability reporting.



work
Construct, 2022 adapted from Wang (2017)

Firm Characteristics

Zou and Stan (1998) described firm characteristics as a firm's demographic and managerial variables which, in turn, comprise part of the firm's internal environment. According to Kogan and Tian (2012), firm characteristics include firm size, leverage, liquidity, sales growth, asset growth and turnover. Others include ownership structure, board characteristics, age of the firm, dividend pay-out, profitability, access to capital markets and growth opportunities (McKnight & Weir, 2008; Subrahmanyam & Titman, 2001). From an accounting perspective, environmental information disclosure or environmental reporting or sustainability reporting could be influenced by many factors ranging from general contextual factors to internal context, to corporate characteristics (Adams, 2002). Corporate characteristics include many company attributes like board characteristics, corporate economic performance, ownership structure, industrial type, firm size, effective tax rate, among others.

Sustainability Reporting

Sustainability is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987 cited in Wanner & Janiesch, 2019). Reporting means to reveal or disclose information. Spence and Gray (2007) define sustainability reporting as the process through which organisations communicate the social and environmental effects of their economic actions to stakeholder groups within society and society at large, adding that it has been commonly understood as a way of ensuring the legitimacy of organisations, a tool to manage stakeholder relationships, or a process to build good impressions and/or to hide conflicts. Loh *et al*. (2017) state that sustainability reporting refers to the disclosure of non-financial information including aspects such as Economic, Environmental, Social and Governance (EESG) factors. Joseph (2014) notes that sustainability reporting is also used synonymously with other terms such as, citizenship reporting, social reporting, and triple bottom line (TBL) reporting that encompass the economic, environmental, and social aspects of an organization's performance.

According to Global Reporting Initiative (2013), sustainability reporting is a way of measuring, disclosing and being accountable to organizational stakeholders. Aman and Bakar (2018) stress emphatically that there is no single universally accepted definition of sustainability but that the most widely used definition around the world is that developed by the Brundtland Report of the World Commission on Environment and Development. Spence and Gray (2007) define sustainability reporting as the process through which organisations communicate the social and environmental effects of their economic actions to stakeholder groups within society and society at large. They added that sustainability reporting has been commonly understood as a way of ensuring the legitimacy of organisations, a tool to manage stakeholder relationships, or a process to build good impressions and/or to hide conflicts (Spence & Gray, 2007).

Haladu and Salim (2017) asserted that sustainability information disclosure is a vital ingredient of corporate governance. They added that with the rigorous and selfish pursuance by corporate bodies of increased wealth and growth, the need for sustainable development has become inevitable. Wang (2017) argues that sustainability reporting includes environmental aspects (such as raw materials, energy, water, biodiversity, air, suppliers, products and services, and transportation) as well as social aspects (such as labour practices, human rights, customer health and safety, respect for privacy, public policy competition, pricing, and corporate citizenship.

Adams (2004) argues that sustainability reporting is subject to concerns in terms of the completeness and credibility of the information since most enterprises disclose only appropriate information to gain the corporate advantage, and a good reputation instead of looking for transparency and accountability for stakeholders. Sustainability Report, according to Mapparessa *et al*. (2017) is a type of report that is voluntary and made as a complement of financial statements, dwelling on three performances related to economic, social and environmental performance.

Leverage

Leverage rate is regarded as the extent to which a company borrows to finance its operation about the total assets held by the company. According to Nasir *et al*. (2014), leverage is the ratio of total debt to total equity that form the firm's capital structure. Sari and Marsono (2013) maintain that the higher the leverage rate, the more likely the company will infringe on the loan agreement, such that the company will try to report higher earnings, which can be one way to reduce costs including the cost of disclosing social information and thereby reduce sustainability reporting. Alsaeed (2006) noted that a high leveraged company tends to disclose more information to demonstrate its ability to pay its obligations, pointing out that, companies with higher debt in their capital structure are prone to higher agency costs and to mitigate agency costs, a highly leveraged company may be more likely to provide voluntary information through sustainability reports.

Broberg *et al*. (2010) argued that a highly leveraged capital structure with substantial debt financing is synonymously associated with a higher level of sustainability information disclosure on account of a more demanding debt covenant and contracting cost between the company and its debt suppliers. In the same line of argument, Cormier and Magnan (2003) emphasize that highly indebted company managers are predisposed to disclose more information voluntarily to justify their financial position and project a positive socially responsible image to stakeholders. On the contrary, Barnea and Rubin (2010) and Eng and Mak (2003) insist that a high level of restrictive debt covenants in debt agreements comprehensibly reduces the need for additional disclosure in annual reports, and that owing to a higher level of insolvency and debt-servicing obligations, debt-laden companies are unwilling to incur extraordinary costs to invest in non-value creating corporate social responsibility activities and so reduces corporate sustainability disclosure.

Profitability

Profitability refers to the excess income over expenses incurred in a business**.** Rohmah (2015) states that profitability has a positive influence on the disclosure of sustainability and corporate social responsibility report. Cortez (2011) indicates that companies disclose more on environmental reporting when their economic performance measured by profitability is good and less when their performance is poor. Loh et al. (2017) quoted Herremans, Akathaporn and Mclnnes (1993) who found out that large manufacturing companies with better reputations for social responsibility outperformed companies with poorer reputations and that companies with higher profits tend to be more socially responsible, resulting in a steadier performance and lower total risk.

Ameer and Othman (2012) observed that a significantly higher profit before taxes and cash flows from operations in some sectors are discovered when companies engaged in sustainable reporting practices compared to those who did not, adding that publishing a sustainability report is found to have positive effects on the firm’s market value, which implies that investors attach a positive value to such reports and thus reflecting the anticipation of future cash flows (Berthelot *et al*., 2012). In addition, Cormier *et al*. (2005) assert that higher disclosure or better sustainability reporting improves the credibility of firms' profitability as it allows investors to make decisions with less risks and more efficiently which may suggest higher firm value. In expressing their findings, Haniffa and Cooke (2005) point out that profitable companies are more financially-able to report socially responsible behaviours than companies with weaker financial performance that suffer loss.

Empirical Review

Firm Leverage and Sustainability Reporting

Onyinye and Amakor (2019) examined firm attributes and sustainability reporting in Nigeria. The study used a sample of 35 manufacturing companies listed on the Nigerian Stock Exchange. Secondary data retrieved from corporate annual reports of the environmentally sensitive companies quoted from 2011-2017 were used. The generalized Least Square technique was utilized. The Pesaran cross-dependence test was employed to confirm the threat of the serial correlation in the errors and the statistic reveals the absence of cross-section dependence in the residuals. The study found that overall, only firm size is seen as the only variable to having a positive and significant impact on sustainability reporting. However, financial leverage has an insignificant impact on sustainability reporting. They used a weaker statistical tool of ordinary least square regression technique to estimate their data which affects the predictive outcome of their results. Furthermore, even though their study was carried in 2019 their data covered only up to 2017 which affect the currency of their study.

Lucia and Panggabean (2018) analyzed the effect of company's characteristics which are profitability (ROA), leverage (DER), liquidity (CR), company size (SIZE), and corporate governance proxied by the board of directors and audit committee (KA) to the disclosure of sustainability reports (SR). The study sampled 105 manufacturing companies listed on Indonesia Stock Exchange and 262 manufacturing companies listed on Malaysia Exchange in the year 2013-2015. The data analysis was done using the regression logistic method with EViews version 9. The results show that the partial results of hypothesis testing variables DER, CR, and Directors do not have a significant effect on financial reporting, but ROA and SIZE have a significant influence on sustainability report disclosure (SR) of manufacturing companies listed on IDX and Bursa Malaysia. The study used an appropriate statistical tool for an estimation which enhances the predictive outcome of the results. However, their study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences.

Amir *et al*. (2018) carried an analysis on the influence of profitability, firm size, liquidity, and leverage on the expression of firms' social responsibility in banking firms listed in BEI (Indonesian stock exchange). The population consist of 28 banking companies listed in BEI from 2012 to 2016, and all of them were used as samples. Ordinary Least Square multiple linear regression analysis with software E-Views 7. The study found that, simultaneously, financial factors (profitability ratio, firm size, liquidity and leverage) had a significant influence on the expression of firms' social responsibility. Partially, the ratio of firm size and leverage of financial factors had a significant influence on the expression of firms' social responsibility, while the variables of profitability and liquidity had a significant influence on the expression of firms' social responsibility. The study used a weaker statistical tool of ordinary least square regression technique to estimate the data. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Tong (2017) assessed the effects of company-specific variables on the level of corporate social responsibility (CSR) information disclosed in publicly-traded companies from the United Kingdom (UK) and Malaysia. Content analysis was applied to sampled reports from the Financial Times Stock Exchange (FTSE) *100 Index* and FTSE Bursa Kuala Lumpur Composite Index *(KLCI)* against inferred meanings from the Global Reporting Initiative (GRI)-derived coding base to identify similarities and/or differences in CSR disclosure practices. The Spearman's correlation coefficients and multiple OLS linear regressions analyses further gauged the associations between the variables and total quantity of CSR disclosure (TQCSR); and, determined the predictive determinants on sustainability reporting. Spearman's correlation has identified a negative association of leverage with TQCSR for UK companies. In contrast, the TQCSR in the Malaysian sample was positively associated with directors' CSR-related experiences and profitability but negatively associated with company size. Results from OLS analyses presented company size as a significant determinant on sustainability reporting in the UK model, while directors' experiences were indicated as the crucial determinant in the Malaysian model. This first, direct cross-market sustainability reporting study highlights the importance of the board of directors' CSR-relevant experience in influencing the level of CSR disclosures in publicly-traded companies. The study used correlation and OLS analysis techniques which are weaker methods for this kind of study that affect the reliability of the results. However, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Modugu and Eboigbe (2017) examined corporate attributes and corporate disclosure level of listed companies in Nigeria: a post-IFRS adoption study. Secondary data was obtained from the annual reports of 60 companies listed on the Nigerian Stock Exchange from the various sectors of the Nigerian economy. The study covered a period of post-International Financial Reporting Standards (IFRSs) adoption of three years (2012 – 2014). Ordinary Least Squares (OLS) regression technique was used. The study found that there is a steady improvement in mandatory disclosure by Nigerian companies since the country's adoption of IFRSs. It also found a significant positive association between firm size and mandatory disclosure. It further found a significant negative relationship between leverage and mandatory disclosure. Both leverage and firm size showed a significant positive relationship with voluntary disclosure. The study used a weaker statistical tool of ordinary least square regression technique to estimate the data which affects the predictive outcome of the results.

Yousra (2017) examined the impact of corporate characteristics on environmental information disclosure: an empirical study on the listed firms in Egypt. The population consists of 50 most active firms in the Egyptian stock exchange and the analysis was done using the financial statements from the disclosure book for the period 2007-2011. The final count for the firms is 45, after excluding banks and insurance companies, for having different disclosure requirements and different corporate governance codes. Ordinary Least Square (OLS) regression model was applied. The study found that there is an insignificant relationship between two factors of firms' characteristics (Firm Size and Firm Financial Leverage) and EID, while Firm's age showed a negative significant relationship with EID and finally Firm's Profitability showed a positive significant relationship with EID. The study used a weaker statistical tool of ordinary least square regression technique to estimate the data. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Profitability and Sustainability Reporting

Miaad (2020) examined the determinants of sustainability disclosure of Saudi listed companies. The study used a content analysis approach to collect data from annual reports of non-financial companies listed on the Saudi stock market between 2015 and 2017. The population comprises 357 listed companies on the Saudi stock exchange with a sample of 119 non-financial companies that were listed during the study period. The study used panel least square regression to estimate their model. The Global Initiative Reports GRI (G4) issued by the United Nations in 2013 was used to examine these annual reports concerning the disclosure of environmental sustainability. The study found that the type of industry, company's profits, company size and company age are important determinants when it comes to the disclosure of environmental sustainability for Saudi non-financial companies listed from 2015 to 2017. The study was carried out in 2020 and his data covered only up to 2017 which affect the currency of his study. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Otuya *et al*. (2019) examined the influence of companies' governance processes on sustainability reporting in Nigeria. The population was made up of all listed oil and gas companies in Nigeria. Secondary data were obtained through manual content analysis of corporate financial statements using a modified checklist based on Securities and Exchange Commission (2018) Sustainability Reporting Guidelines to examine the level of disclosures by sampled firms for the period 2016 to 2018. The study used descriptive, correlation and panel regression analyses as data analytical techniques. The study found no significant positive association between board activity, board globalizing, executive compensation and profitability but a negative association with audit committee strength. The study was carried out in 2019 and the data covered up to 2018 which enhance the currency of the study.

Ariyani and Hartomo (2018) examined the effect of firm characteristics proxied by firm size, financial performance such as profitability ratio, liquidity, leverage, industry type and governance committee towards sustainability reporting based on GRI G4 standard. The study used: (a) GRI disclosure calculated using GRI index which exists in Indonesia has a fairly good average of 0.59 in 2014; 0.60 by 2015; 0.60 in 2016. Only leverage and Governance Committee variables have a significant effect on SR reporting, while firm size, profitability, liquidity and type of industry variables have no significant effect on sustainability reporting disclosure. The study used a weaker statistical tool of analysis technique to estimate the data. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Evi and Kendra (2017) examined firms' characteristics and CSR disclosure, Indonesia and Malaysia cases. Purposive sampling was used to collect the data from manufacturing firms listed in the Indonesia Stock Exchange (IDX) and Malaysian manufacturing firms listed in Bursa Malaysia covering the periods of 2010 to 2014. The study utilized secondary data obtained from firms' annual report for the period while reports regression analysis was used. The study found that firms' size and profitability has a positive effect on CSR disclosure. It also found that leverage does not affect CSR disclosure. Meanwhile, liquidity in Indonesian firms shows a positive effect on CSR disclosure, while in Malaysia, it showed a negative effect on CSR disclosure. The study used a weaker statistical tool of ordinary least square regression technique to estimate the data. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Ndukwe and John (2015) examined the determinants of environmental disclosures in Nigeria: a case study of oil and gas companies. The study used a sample of 15 companies drawn from the oil and gas sectors of the Nigerian stock exchange for 2008-2013. Secondary data was sourced from the annual reports of the sampled companies while the Binary regression technique was used as the data analysis method. The study found that there is a significant relationship between company size and corporate social responsibility disclosures. It also found that there is no significant relationship between profit and corporate social responsibility disclosures. The study further found that there is no significant relationship between leverage and corporate social

responsibility disclosures. It finally found that there is no significant relationship between audit firm type and corporate social responsibility disclosures. The study used an appropriate statistical technique to estimate the data; also, the study combined data from both pre (2008-2011) and post (2012-2013) IFRS implementation in Nigeria which affects their study findings.
Marko and Stephanie (2014) examined profitability and corporate social responsibility: an analysis of Indonesia's listed company. Their population constitute companys' profitability of net profit margin, ROA and ROE, concerning the number of lines in CSR disclosure. The samples were taken from 543 listed companies in Indonesia from 2007 to 2009 after fulfilling certain requirements. The study used ordinary least square technique to estimate the model. The study found that not all profitability ratios are significantly correlated to CSR disclosure. Kompas100 and industry-specific tend to have a relationship with the number of lines in the CSR report. The study used a weaker statistical tool of ordinary least square regression technique to estimate the data. Also, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period.

Manuel *et al*. (2014) examined factors influencing the assurance of sustainability reports in the context of the economic crisis in Portugal. Logistic regression was used to analyse some factors that influence the decision to have sustainability reports assured. The study found that size, leverage, profitability, listing status and industrial affiliation are determinants of SRA, whereas the type of ownership is not. The study used appropriate statistical tools of analysis to examine the data that provides reliable predictive results. However, the study was carried out in another environment outside Nigeria in the past which cannot be generalized because of the environmental differences and also the need to update the data up to the current period in Nigeria.

Theoretical Review

Stakeholder Theory

This theory posits that an organization strives to harmonize its activities with stakeholder expectations through corporate social reporting (Barako & Brown, 2008). From this perspective, communication of CSR activities provides an opportunity to maintain healthy relationships with stakeholders by demonstrating the companies' adherence to responsible business practices (Jain & Winner, 2016). Therefore, stakeholder theory views communication of corporate social responsibilities as a means to respond to significant pressures from company stakeholders (Al Farooque & Ahulu, 2017; and Odriozola & Baraibar-Diez, 2017). Stakeholder theory focuses on particular groups within society, such as employees, shareholders, investors, consumers, and non-governmental organizations (Reverte, 2009). This study is anchored on the stakeholders' theory because corporate sustainability concerns certain stakeholders that have something to do with the company. Such stakeholders include the society in which the business found itself, the creditors, shareholders, potential investors among others who are interested in how much of the company's earnings are committed to meeting social, economic and environmental replenishment.

Methodology

This study used descriptive research design, specifically the longitudinal design method which is necessitated by the panel nature of the data. This design ensures the measurement of variables between components of the independent variable and the component of the dependent variable. The population of the study consists of all fifty-six (56) firms in manufacturing sectors listed on the Nigerian stock exchange as of 31st December 2019. The study used the period of 2009-2019. The sample size of this study comprises all the manufacturing firms (consumer goods, industrial goods, oil and gas, conglomerates and natural resources) quoted on the Nigerian stock exchange, using the census method. The study used documentary data that were extracted from the annual reports and accounts of the sampled firms and the Nigerian Stock Exchange factbook and website.

The data were analysed using descriptive statistics to show the behavioural pattern of the data series and also test for independent observations was carried out, variance inflation factor was used to test the absence of multicolinearity while logistic regression model was used to test the formulated null hypotheses. The independent variable in this study is firm characteristics represented by leverage (LEVRG) and profitability (PROF) while the dependent variable; sustainability reporting is measured by the corporate sustainability reporting (CSR) index. Binary logit regression was used to analyse the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria. The choice of Maximum Likelihood (ML) binary logit regression model is based on the inability of the Ordinary least square multiple regression model to yield reliable coefficients and inference statistics in a situation where the dependent variable is binary (0 and 1). Thus the binary logit regression model unlike others is based on the use of the dichotomous dependent variable. Therefore, a dummy value of 1 is used if CSR is disclosed, if not 0. In line with the empirical studies of Lucia and Panggabean (2018), Manuel *et al*. (2014) and Ndukwe and John (2015). Logistic regression was analysed with the aid of Stata 15 software. Different tests were conducted for the study, such as independent observations and Variance Inflation Factor.

Model Specification

$$LOGIT_{it} = In\left(\frac{CSRit}{1-CSRit}\right) = \beta 0 + \beta_1 LEVRG_{it} + \beta_2 PROF_{it} + \mu_{it}$$

Where**:**

CSR	=	Corporate sustainability reporting of firm i at time t
$\beta 0$	=	Constant term (intercept);
$\beta_1 - \beta_2$	=	Coefficients for the independent variables
LEVRG	=	Leverage,
PROF	=	Profitability

μ = Error Term

Variables Measurement and Justification

Table 1 below explains the variables of this study

Variable	Acronym	Type	Measurement	Justification
Corporate Sustainability Reporting	CSR	Dependent	Information on efficient use, reduction, reuse, recycling, conservation and management of natural resources (water, land, air, paper, raw materials) exist. 1 = Reported/discussed with the reporting period. 0 = Not reported.	Aman and Bakar (2018).
Leverage Ratio	LEVRG	Independent	The ratio of debts to total assets	Lucia et al (2018); Aman et al (2018); and Lucia et al (2018).
Profitability	PROF	Independent	Profit before tax	Diantimala (2018); Aman et al (2018); and Haladu et al (2017).

Source: Researcher's compilation (2022)

Results and Discussion

The data of fifty-six (56) manufacturing firms regarding corporate sustainability reporting (CSR), leverage (LEVRG) and profitability (PROF) are used for the analysis. The data were analysed with the aid of Stata 15 software using Descriptive Statistics, Test for Independent Observations, Variance Inflation Factor and Logistic Regression Model.

Descriptive Statistics

Table 2 summarises the descriptive statistics of the entire data set.

Variable	Obs	Mean	Std. Dev.	Min.	Max.
CSR	528	.1515152	.3588903	0	1
LEVRG	584	.5431693	.1975123	.0235557	.8737293
PROF	467	6.082587	1.030379	2.607455	8.478287

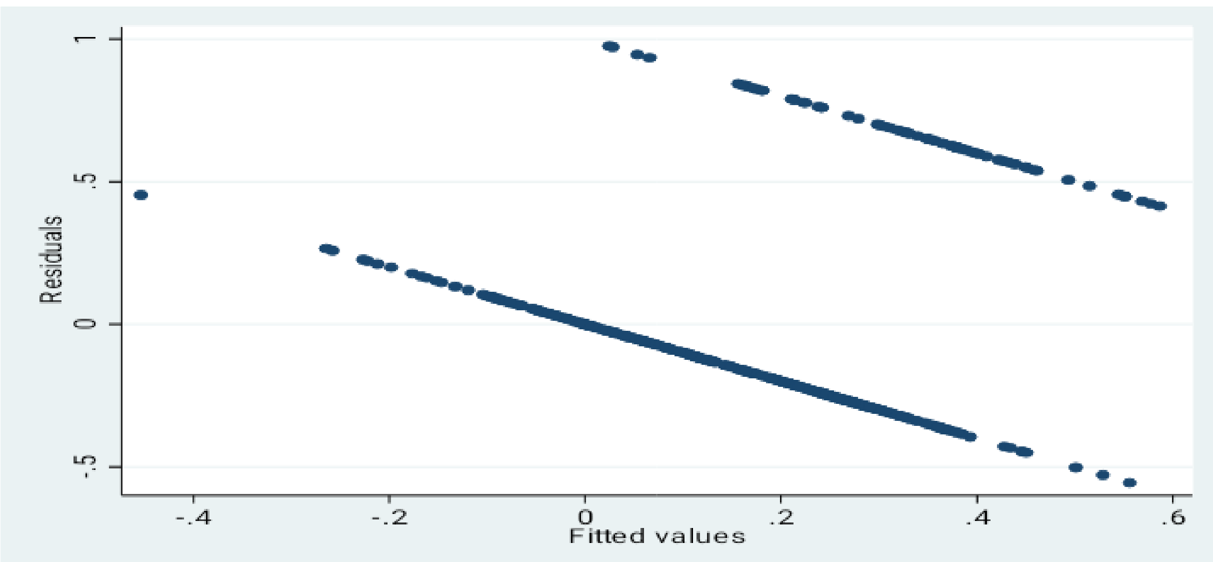
Source: Researcher's Computation using STATA 15 software

Table 2 shows that the corporate sustainability reporting (CSR) has a minimum value of 0, a maximum value of 1 and a mean value of 0.1515152 that is within the minimum and maximum values indicating a good spread within the period studied. The Table also reveals that CSR has a standard deviation of 0.3588903 which is more than the mean, which implies that it had strong growth for the period under review. Table 2 also shows that leverage (LEVRG) has a minimum value of .0235557, a maximum value of 0.8737293 and a mean value of 0.5431693 that is within the minimum and maximum indicating a good spread within the period studied. The table also reveals that LEVRG has a standard deviation of 0.1975123 that is less than the mean, which implies that it had a slow growth during the period under review. Table 2 equally shows that the profitability (PROF) has a minimum value of 2.607455, a maximum value of 8.478287 and a mean value of 6.082587 that is within the minimum and maximum values indicating a good spread within the period studied. The table also reveals that PROF has a standard deviation of 1.030379 that is less than the mean, which implies that it had slow growth for the period under review.

Test for Independent Observations

Logistic regression assumes that the observations in the dataset are independent of each other. That is, the observations should not come from repeated measurements of the same individual or be related to each other in any way. The result of a plot of residuals against time (i.e. the order of the observations) shows that there is a random pattern. Indicating that observations are independent and satisfy one of the assumptions of logistic regression as presented in figure 1 below.

Figure 1: Plot of Residuals against Time



Variance Inflator Factor (VIF) Results

Table 3: Variance Inflator Factor (VIF)

Variable	VIF	I/VIF
LEVRG	1.02	0.97569 0

PROF	1.02	0.97569 0
Mean VIF	1.02	

Source: Researcher's Computation using STATA 15 software

In a bid to further test the absence of multicolinearity problem among the exogenous variables, colinearity diagnostics test were observed as the Variance Inflation Factors (VIF) and the Inverse Variance Inflation Factors (1/VIF) values portray no multicolinearity problem in the data as their values are less than 10 and 1 respectively (Gujarati, 2003) as presented in table 3. This point to the fact that the variables are well selected and can fit in the same regression model because there is the absence of a multicolinearity problem in the model, which is one of the requirements for logistic regression analysis.

Logistic Regression Results

Table 4: Logistic Regression Results were conducted for the estimation of this model.

Variable	**Coefficient (Odds Ratio)**	**Z-statistic**	**Prob.**
Cons.	-2.140006	-7.99	0.000
LEVRG	-0.8924482	-0.12	0.904
PROF	5.815833	7.69	0.000
Model Fit			
LR $chi^2(2)$	97.57		
Prob.> chi^2	0.0000***		
Log likelihood	-144.62912		
Pseudo R^2	0.5222		
No of Obs.	417		

Source: Researcher's Computation using STATA 15 software

From the results in Table 4, the LR Chi-squared statistic of 97.57 is significant at 1% level of probability. This indicates a good fit and correctness of the distributional assumption of the component error term. This means that the logistic model used to estimate the firm characteristics on corporate sustainability reporting is an adequate representation of the data. The pseudo R^2 of 0.5222 confirms approximately 52% of changes in the CSR are attributed to the explanatory variables included in the model. This means that 52% of the variation in CSR is explained by the variables (LEVRG and PROF) included in the model.

Test of Hypotheses

To evaluate the effect of firm characteristics on sustainability reporting of listed manufacturing firms in Nigeria, the formulated hypotheses were tested using a logistic regression model.

The results in Table 4 above show that the z-value of -0.12 and the corresponding p-value of 0.904 shows that leverage (LEVRG) has an insignificant negative effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. Based on this, the null hypothesis which says that leverage (LEVRG) has no significant effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria fail to be rejected. Table 4 equally indicates that the z-value of 7.69 and the corresponding p-value of 0.00 shows that profitability (PROF) has a significant positive effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. Based on this, the null hypothesis which says that profitability (PROF) has no significant effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria is rejected.

Discussion of Findings

Leverage and Corporate Sustainability Reporting

Leverage (LEVRG) has an insignificant negative effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. This implies that an increase in firm leverage level will decrease the odds ratio in favour of corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria by -0.8924482. This finding is in line with the a-priori expectation of the researcher because an increase in leverage level reduces corporate sustainability reporting in quoted manufacturing firms in Nigeria. The finding is also in line with the stakeholders' theory which emphasized that organisations harmonized their activities with stakeholder expectations through corporate sustainability reporting. The leverage has an insignificant negative effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. This is supported by the findings of Onyinye and Amakor (2019), Lucia and Panggabean (2018), Yousra (2017), Evi and Kendra, (2017) and Ndukwe and John (2015). However, it is not in line with the findings of Amir *et al*. (2018), Modugu and Eboigbe (2017) and Ariyani and Hartomo (2018).

Implication of Finding

The practical implication of the finding is that increase in firm leverage level will decrease the odds ratio in favour of corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria

Profitability and Corporate Sustainability Reporting

The study also reveals that profitability (PROF) has a significant positive effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. This implies that an increase in profitability will increase the odds ratio in favour of corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria by 5.815833. The finding is in line with the a priori expectation of the researcher because profit is expected to increase the level of corporate sustainability reporting of quoted manufacturing firms in Nigeria. The finding is in line with the stakeholders' theory which emphasized that organisations harmonized their activities with stakeholder expectations through corporate sustainability reporting. The profitability has a significant positive effect on corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria for the period under review. This finding is in agreement with the findings of Amir *et al*. (2018), Lucia and Panggabean (2018), Miaad (2020), Evi and Kendra (2017) but not in line with the findings of Ariyani and Hartomo (2018) and Ndukwe and John (2015).

Implication of Finding

The practical implication of the finding is that increase in profitability will increase the odds ratio in favour of corporate sustainability reporting (CSR) of quoted manufacturing firms in Nigeria.

Conclusion and Recommendations

Management of manufacturing firms in Nigeria must maintain a low leverage level to enhance the disclosure of corporate sustainability reporting in Nigeria. The companies with high financial leverage levels will disclose less corporate sustainability reporting which will, in turn, reduce their relationships with their host communities and the society at large. The profitable firms will increase the level of their corporate sustainability reporting. Management of manufacturing firms in Nigeria must strategies in ways of cost control mechanism to increase their profits to further enhance the level of their corporate sustainability reporting in Nigeria.

Based on the above conclusion, the following recommendations are proffered:

i. The management of manufacturing firms in Nigeria should maintain a low financial leverage level to increase the level of disclosure of their corporate sustainability reporting in Nigeria.
ii. The management of manufacturing firms in Nigeria should strategies in ways of cost control mechanism to increase their profits to further enhance the level of their corporate sustainability reporting in Nigeria.

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