

Effect of Firm Attributes on Financial Performance of Listed Manufacturing Firms in Nigeria

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Abstract

The study investigates the effect of Firm Attributes on the financial performance of listed manufacturing firms in Nigeria. Firm Attributes is a critical determinant of financial stability, and its management plays a crucial role in optimizing firm performance. The population of the study covered seven (7) Manufacturing Firms Listed on the Nigeria exchange as at 31st December 2023. It Covered the period of Twelve years (12) 2012-2023. The study employs key financial indicators such as Return on Assets (ROA), Liquidity (LIQ), Firm Size (FS), and Capital Adequacy (CA) to analyze their impact on financial performance. Secondary data from listed manufacturing firms were collected and analyzed using descriptive statistics, correlation analysis, regression models, robustness tests, and diagnostic tests. The findings reveal that liquidity (LIQ) does not significantly impact financial performance. This suggests that holding excessive liquidity does not necessarily enhance profitability, as firms may fail to invest their liquid assets effectively. Firm size (FS) has a significant negative effect on financial performance, indicating that larger firms experience declining profitability due to inefficiencies or increased operational costs. Meanwhile, Capital Adequacy (CA) does not exhibit a significant relationship with financial performance, implying that a higher proportion of capital does not necessarily translate into improved profitability. Based on these findings, the study provides important policy recommendations. Firms should adopt optimal liquidity management strategies by investing excess cash in productive ventures rather than accumulating excessive liquid assets. Asset utilization should be prioritized, ensuring efficient allocation rather than just increasing firm size. Policymakers should introduce incentives for firms to optimize their asset allocation and financial management practices, including tax relief and funding support for efficiency-driven initiatives.

KEYWORDS: Capital Adequacy Financial Performance, Firms Attributes, Firm Size, liquidity

1.0 Introduction

The manufacturing sector plays a major role in the economy as they motivate the nation at large. This is because the sector is part of protected and restoration system of an economy and successful operation of the industry can set vigor for other industries and development of an economy (Abate, 2012). Indeed, a well-developed and evolved manufacturing sector is critical to conditions for economic development as it provides long term funds for long term investment for the country. The financial performance of a firm plays a major role for increasing the market value of the firm and the growth of the industry which ultimately leads towards the overall prosperity of the economy. One of the goals of any company is to create value by providing returns for the

shareholders of the company. On one hand, the company's long-term goal is to maximize the shareholders' value which results from sustainable financial performance. On the other hand, the company's value is the key concern to investors. Therefore, it is important to understand that shareholders and investors need assurance upon their funds which they have already invested and returns upon their investment. The company will try to maximize the value of all the stakeholders' investment, by increasing the company financial performance.

Efficient management of assets plays an important role of overall corporate strategy in order to create shareholder value. In today's business environment, manufacturers work constantly to increase assets utilization and reduce loss in the ongoing effort to achieve high performance. This is as a result of pressure from shareholders which is greater now than ever and thus, the funds available for investment that would lead to improvements are often limited. To remain competitive, companies must get more from their assets while keeping costs down (Carlos & Rodrigo, 2010). One way to achieve this is by improving asset quality. Asset quality is referred to as the result of the time lag between the expenditure for the purchase of raw material and the collection for the sale of the finished goods. The way of managing assets can have a significant impact on both the liquidity and profitability of the company (Shin & Soenen, 2011).

In Nigeria, the manufacturing sector contributes significantly to the economic growth of the country. According to the Central Bank of Nigeria (CBN, 2010), the industry contributes about 90% of Nigeria's foreign exchange earnings. Despite its strategic importance, the operations of the manufacturing industry have been faced with series of challenges such as rising inflation and cost of materials, insecurity and bad debts. Manufacturing firms in Nigeria are facing crucial problems that are persistently led to their winding up. A lot of industries in Nigeria have closed down, some relocated while others are operating far below installation capacity (Ogbuji & Ogunyomi, 2014). Owing to the importance of the manufacturing sector to the economy of Nigeria and the significant role it plays in the economic development of the country it is imperative to examine the asset quality of manufacturing firms in Nigeria. This study is therefore motivated by the dearth of local empirical studies on the association between asset quality and financial performance of the sector, make a study that will enable better understanding of the nature and extent of the association more desirable.

One of the most fundamental facts about businesses is that the financial performance of the firm shapes its financial structure and has the necessary liquidity to run its financial obligations and among other things. In other words, financial performance is the results of a firm's policies and operations in monetary terms. It is seen as an indication of how companies use their limited resources to achieve the stated goals. Similarly, increased liberalization of the capital market has resulted in the inflow of foreign companies that are stronger and financially stable. This has resulted in the globalization of business and hence aggressive competition for large market share has called for firms to maintain high performance. Performance is an indicator or index of corporate success and benchmark for investment purposes (Ruhomaun & Nagaohi, 2019). This means that it is used to measure firm's overall financial health over a given period of time and can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. These performances are functions of activities that transpire within and outside the companies. The better their performances, the greater the willingness of investors to invest in the companies.

However, many developing countries, including Nigeria have very large stock markets but the performances of the companies have continued to be terribly meagre which make it difficult for them to survive competition with their foreign counterparts. Many firms performed far below expectation in terms of innovation, overall output, revenue generation and profitability (Odusanya, Yinusa & Ilo, 2018). In a situation where the financial performance continues to decline, financial distress gradually creeps in. Since financial distress is known to cause major losses and is harmful to various stakeholders, accessing capital becomes difficult, firm's position in the market weakens, sharp decline in firm's value and if financial distress is not curbed early, the situations may eventually lead to bankruptcy. Firms that persistently incur losses exit the market and the profitable ones stay in (Safarova, 2010). Continuous exit of firms from the market in the long run contributes to the slow growth rate of the country.

In Nigeria, the recent challenges in the economy has resulted in the need to identify factors that contribute to the country's underwhelming performance. However, while factors like unstable exchange rate, rising inflation and insecurity rates are studied at macroeconomic level, factors like financial and operational factors have received little attention at firms' level (Offiong, Udoka & Bassey, 2019). In the recent years, the challenges faced by the Nigerian manufacturing sector is enormous and the need to resuscitate the sector as one of the drivers of growth has resulted in the need to investigate the factors that influence manufacturing sector performance. However, few studies focused on the effect of Firm quality on financial performance of manufacturing firms in Nigeria. Most of these studies focused on the effect Firm quality on financial performance of banks. This study, therefore, investigates the effect of Firm asset quality on the performance of listed manufacturing firms in Nigeria.

2.0 Literature

Bhunia, Mukhuti and Roy (2011) defined financial performance as firm's overall financial health over a given period of time. Financial performance of a firm for a period can be ascertained through the process of financial performance analysis. Eshna (2012), states that financial performance analysis is the process of measuring the results of a firm's policies and operations in monetary terms. Also Bhunia et al (2011) affirmed that financial performance analysis is the process of determining the operating and financial characteristics of a firm from accounting and financial statements and that the analyst attempts to measure the firm's liquidity, profitability and other indicators that the business is conducted in a rational and normal way; ensuring enough returns to the shareholders to maintain at least its market value. Financial analysis involves the use of financial statements. A financial statement is a collection of data that is organized according to logical and consistent accounting procedures. Its purpose is to convey an understanding of some financial aspects of a business firm. It may show a position of a period of time as in the case of a Statement of Financial Position, or may reveal a series of activities over a given period of time, as in the case of an Income Statement. Thus, the term financial statements" usually refers to two basic statements: The Statement of Financial Position and the income statement.

Financial performance explains the ability of management of a company to use assets/capital to generate revenue which will be able to satisfy the running expenses to declare profits which is to be distributed to shareholders. Since the main objective of every firm is earning profits to the providers of capital for which management has invest and sacrifices certain portion of capital of the business provided by shareholders (Swain & Das, 2017). Erasmus (2008) contended that a

valuable tool that aids stakeholders to evaluate the financial position of firm is financial performance. Financial performance explains the financial strengths of firm, financial weakness, opportunities as well as financial threats to the firm (Dogarawa & Harun, 2016). The performance of a firm is reflected in how effectively the resources of the company are managed by the firm.

Financial Performance refers to the degree to which financial objectives has been accomplished. It is the process of measuring the results of a firm's policies and operations in monetary terms. It is used to measure firm's overall financial health over a given period and can also be used, to compare similar firms across the same industry or to compare industries or sectors in aggregation. Mohammed and Mohammed (2022) Firm attribute is one of the major factors and driver that enhance the success or failure of any company. A company that have a good and sound specific attribute stands a chance of performing better than a company with a slapdash specific attribute.

Chemweno (2016), posit that firm characteristic consists of structure, capital and market-related structures. The structures related are firm size, ownership and firm age. These market-associated structures include environmental uncertainties, industry type and the immediate marketing environment while the capital-related structures include liquidity and capital intensity (Alseaed, 2006).

Firm size refers to the speed and extent of growth that is ideal for a specific company. Most companies' intent to expand the size of their business operation for them to grow either in revenue, profit, number of employees, or size of facilities (Pervan & Visic, 2012). Many companies compete in rapidly changing industries, expansion of manufacturing capacity, geographical presence, market shares and so on which may be imperative for survival (Dogan, 2013). According to Junaidi and Hartono (2010) Firm size can be seen from the company's financial condition such as the amount of total asset. Big firms tend to have better financial management and ability to produce quality financial statements than small firms. Ajao and Ogieriakhi (2018) argued that the size of a firm is the amount and variety of production capacity and ability a firm possesses or the amount and variety of services a firm can provide concurrently to its customers.

Liquidity is the available cash for the near future, or any asset that can be easily and cheaply converted to cash. A firm can use its readily available cash to finance its operations when the long-term financing is not available. Readily available cash also helps to deal with its obligations when the earnings are low, and can also help in meeting unexpected emergencies. Almajali et al. (2012) found that firm liquidity had significant effect on Financial Performance of firms. It is therefore important that companies increase their current assets and decrease current to improve on liquidity. Liquidity refers to the ability to meet obligations to the investors of the business as they fall due. It is the ability to fulfill financial obligations as they mature in order to have a sustained and viable industry business (Serrasqueiro, Nunes, & Armada, 2016).

Capital adequacy refers to sufficiency of capital for operational existence. Capital adequacy is essential for the soundness and economic performance of any organization; however, the argument that is still open ended is determining how much capital is adequate to drive business success. (Lekaaso et al., 2020). Capital is needed in sufficient levels to aid absorption of operational or unanticipated losses, preserve confidence in the continued existence of a business entity and thus forestalling insolvency. This therefore implies that an essential area of any organization is the

availability and adequacy of capital to run its business. Companies may run out of business if they fail to manage their capital effectively (Melani et al., 2019).

Empirical Review

Abraham, Celestine, Lucky, and Yemisi (2024) examined the impact of firm characteristics and profitability of listed industrial goods companies in Nigeria. As a moderating factor, firm characteristics were represented by liquidity, leverage, and firm age, while the return on assets measured profitability. The study data was collected from ten listed industrial goods firms that had consistently published their audited annual financial reports from 2013 to 2022. The panel-corrected standard error for the random effect model was used to analyze the data. The results show that liquidity has a negative and significant effect on profitability. Conversely, leverage and firm age have a positive and insignificant impact on profitability. In evaluating the moderating effect of firm size, the panel regression results conclude that firm age can reduce profitability. However, the analysis also revealed that liquidity has a positive and insignificant effect on profitability when moderated by firm size while leverage has a negative and insignificant result on profitability. On the other hand, firm size significantly moderates the relationship between firm characteristics and profitability. The findings of this study recommend that younger listed industrial goods firms should not be discouraged by the negative effect of their age on profitability rather they may be profitable as they grow old.

Nangih, Turakpe, and Effe-Nnamdi (2023) examined the effect of firm characteristics on financial performance of listed companies. The study population was listed consumer goods firms in Nigeria. The study adopted the ex post facto design and was anchored on the Dynamic capability theory. It employed purposive sampling technique to select a total of 16 companies; which served as sample for the study. Data were sourced from annual financial reports of the sampled firms from 2013 to 2022 and analyzed using descriptive, correlation and panel regression techniques. The findings showed that firm age had a negative, though insignificant effect on EPS. Relatedly, firm age was also found to have a significant negative effect on the ROA of the consumer goods firms. In contrast, firm size (FSIZ) was found to have a positive and significant effect on EPS. Lastly, it was found that FSIZ has a significant negative effect on the return on assets of consumer goods firms in Nigeria. Based on the findings, the study recommended that; firstly, consumer goods firms should not consider firm age as important since it had insignificant effect on EPS. Secondly, since firms age matter when it as to with increase in profitability (return on assets). Thirdly, it was recommended that managers of consumer goods firms should know that as the age of the firms increases, the more the profitability, since it had significant positive effect on ROA. Finally, the study recommended that managers of consumers should increase their firm size, since it contributed significantly to both measures of financial performance.

Ayuba and Joel (2023) study examined the firm characteristics and financial performance of selected Pension Fund Administrators in Nigeria. The population of the study consist of all the Pension Fund Administrators (PFAs) for the period of five years 2018 to 2022. The sample consisted of 10 selected post recapitalizations of the PenCom. A purposive sampling was used in selecting the sample size of the study. The study used secondary data extracted from the published annual reports and accounts of sampled PFAs. The panel data generated were analyzed using descriptive, Pearson correlation and multiple regression model with the help of STATA

version 13. The model proved to be statistically significant with a combined probability of F-statistics of 0.0001 which is below the adopted level of significance of 5%. The result shows that the firm age with a p-value of 0.000 has a significant positive effect on financial performance which is measured by Unit Price. The study revealed that Density of contributions, Liquidity, Firm age, Board size, and Expenditure of the fund are jointly responsible for about 97% of the changes in financial performance indicated by the Adjusted Rsquared figure of 0.970853. Thus, the study concluded that firm characteristics has a significant effect on financial performance of PFAs. Based on these

Grace and James (2022) examined the firm effects attributes had on manufacturing and allied and construction companies listed on NSE financial performance. This research reviewed theories were liquidity preference, trade-off, and pecking order. This survey used a descriptive research design to describe the characteristics of the phenomenon being studied. The study's target population was nine manufacturing and five construction and allied NSE-listed firms. The financial statements were obtained from the various company websites and the NSE website. Descriptive statistical analysis was applied in analyzing the data using regression models, which aided in examining the correlations that existed amongst the study variables. Diagnostic testing preceded data analysis for data reliability and validity determination. The analysis indicated that assets structure had a significant negative correlation with firms' financial performance in the manufacturing and allied firms. In contrast, it was observed that asset structure had an insignificant positive correlation with the firms' financial performance for the construction and allied firms. The study's results also indicated that the leverage ratio had a significant negative correlation with the financial performance of manufacturing and allied firms. For the construction and allied firms', financial leverage had an insignificant positive correlation with the financial performance. Liquidity had an insignificant negative correlation with the manufacturing and allied firms' performance, while for the construction and allied firms, financial performance correlation with liquidity was positive and significant. The study recommended that further research be carried out in the same sectors and the other listed ones to capture firm attributes' effects on financial performance by comparing the pre-Covid and the post-Covid period.

Mohammed and Mohammed (2022) examined the effect of firms' specific attributes and financial performance of quoted conglomerates companies in Nigeria. Secondary data were sourced through the published annual reports of the sampled companies for the period under review 2015-2021. Panel data extracted were analyzed using multiple regression technique after conducting series of robustness checks to ascertain validity. Findings from the study reveal that firm size has a positive and significant effect on financial performance. While liquidity has positive and insignificantly effect on financial performance, on the other hand leverage has a negative but insignificantly effect on financial performance. The study recommends that management should try as much as possible to increase their total asset level as this will serve as a guarantee in generating future economic benefit. Management should also watch out for their leverage level so as to keep it at optimum point, because leverage level negatively influence performance for conglomerate firms in Nigeria based on the findings of these study, within the period under review

Aribaba, Abdul-Lateef, Patrick, Yakibi, and Salaam (2022) examined the effect of firm characteristics on the financial performance of Nigerian-listed oil and gas companies. The information was obtained from the indices report of twelve (12) oil and gas companies listed on

the Nigerian Stock Exchange (NSE) market between the periods 2015 - 2019 which covers the period before and after the economic downturn experienced in Nigeria. The data collected were analyzed using the pool and cross-sectional data. Descriptive statistics were used to examine the characterization of variables while the pooled least square technique was used to investigate the empirical relationship of the variables. The regression result shows that about 69% of the variation in financial performance is explained by the independent variable of Firm Size, Financial Leverage, Ownership Impetrated and Firm Age. Apart from these variables, there are other factors responsible for the financial performance of listed oil and gas companies in Nigeria. The findings revealed that there is a negative relationship between Firm Size and Ownership Impetrated on financial performance, while Financial Leverage and Firm Age showed a positive relationship on the financial performance of listed oil and gas companies in Nigeria. Based on these findings, the study recommends that businesses adopt a culture of capitalizing and reporting all expenditures on their products.

Efuntade and Akinola (2020) examine the impact of firm characteristics on the financial performance of quoted manufacturing firms in Nigeria. Descriptive and cross-sectional research design were adopted to investigate the relationship between variables of firm characteristics and financial performance of quoted manufacturing firms in Nigeria over a period of 14 years. Secondary Data were obtained from annual reports of five selected quoted manufacturing firms. Panel least square regression model was used to test the formulated hypothesis. Findings showed that all the independent variables jointly and strongly have impact on the financial performance of manufacturing firms in Nigeria measured by return on assets. It was concluded the explanatory variables (Firm Age, Firm Size, Sales Growth, Liquidity and Leverage) were significantly associated with the dependent variable (Return on Asset). The Study then recommends that, the managements of manufacturing companies should find ways to improve and acquire the optimal utilization of their assets, while making maximum use of their resources during the production processes and distribution of finished products as this would help them in improving their profits. Etukudo, Okoro and John (2022) studied the effect of firm characteristics on financial performance of listed consumer goods firms. The study utilised secondary data generated from annual reports and accounts of the selected firms. The data collected were analyzed using multiple regression analysis. The finding revealed that (i) Firm characteristics (leverage, firm size, liquidity and operating expenses) have a significant effect on profit after tax of listed consumer goods firms in Nigeria (ii) Firm characteristics (leverage, firm size, liquidity and operating expenses) have a significant effect on return on asset of listed consumer goods firms in Nigeria (iii) Firm characteristics (leverage, firm size, liquidity and operating expenses) have no significant effect on return on equity of listed consumer goods firms in Nigeria.

Olayiwola (2022) studied the effects of firm specific variables on firm financial performance in the Nigerian Manufacturing Sector using secondary data sourced from Annual Reports of twenty (20) manufacturing companies from 2008 to 2017. The variables utilized were Sales Growth (SG), Age of the Firm (AF), Tangibility (TAN), Firm Size (FS), and Leverage (LEV) for firm specific variables. Firm performance was measured by Return on Assets (ROA). Pooled Ordinary Least Square (POLS) regression analysis was employed to ascertain the effects of SG, AF, TAN, FS and LEV on ROA at 0.05 level of significance. Findings showed that SG, AF, TAN, FS and LEV has positive significant influence on ROA. It was concluded that firm specific variables exerted significance influence on the financial performance of the sampled companies.

Ehiedu and Imoagwu (2022) examined the firm specific determinants of profitability of listed Oil & Gas firms in Nigeria between the periods of 2011-2020. The study made use of secondary data which was sourced from the annual reports and accounts of the various 10 Oil and Gas Firms for the measures of firm specific determinants [Firm Size (FS), Firm Age (FA), Liquidity (LIQ), Leverage (LEV), Sales Growth (SG) and Operating Expenses (OE)] in relation to profitability proxy with Return on Assets (ROA). Descriptive statistics and the correlation analysis were used to determine the nature of relationship between the independent and dependent variables. In view of the hypothesis formulated for this research, the method of data analysis chosen was a multiple regression analysis using E-VIEW 9.0. The findings revealed that LIQ, LEV and OE have significant relationship on ROA while FS, FA and SG does not have significant relationship on ROA relationship with ROA. Hence, the study concluded that there is a significant relationship between firm specific determinants and profitability.

Adekola, Olapade, Caroline, and Anifowose, (2024) investigated firm quality and performance of selected listed manufacturing concerns on the Nigerian exchange. The statement of the problem stem from the seemingly negative relationship between audit quality and performance as conducted by some author researchers thereby necessitating more research to be carried out in that respect. The methodology was an ex-post facto research design predicated on the secondary data of the publicly listed companies. The theoretical underpinning was agency theory. The result shows a significant relationship between audit quality and performance and concluded that audit quality is not an end in itself as to always ensure performance. 1.58 (p-value = 0.114 > 0.05) and 1.95 (p-value = 0.051 > 0.05) respectively. Noticeably, the Fcal (4, 615) in the work was 11.27 (p-value = 0.0000), thus confirming that audit quality measures exert joint significant effect on ROA. The study recommends that the country's Financial Reporting Council and other regulators should develop policy guidelines to specifically moderate auditors' tenure vis-à-vis compliance to existing regulatory framework for financial reporting. A reasonable threshold of the level of independence for auditors should be stipulated by regulators so as to ensure that the auditors do not suffer any untoward injury in the conduct of their core auditing mandate.

Evinemi and Emengini (2024) investigates the effect of firm liquidity on capital structure of manufacturing firms in Nigeria using annual data obtained from reports of thirty-one (35) manufacturing firms covering the period 2007-2021. The effects of liquidity on capital structure were examined using the panel Fixed/Random effect methods. The summary statistics, correlation analysis, slope heterogeneity and cross-sectional dependence were conducted as pre-estimation procedures. The study employed debt-to-equity and debt-to-asset ratios to capture capital structure, while cash conversion cycle in days was used to measure liquidity. The findings show that liquidity has negative significant relationship in explaining the debt-to-asset of manufacturing firms and no significant effect in explaining the debt-to-equity of manufacturing firms in Nigeria.

Signaling Theory

The theory is concerned with understanding why certain signals are reliable and others are not in terms of decision making in a competitive environment. The theory looks at the quality and reliability of accounting information sent by a bank to its users of accounting information for investment decision making by the potential investors. Spence (1973) explain that a well performing bank distinguishes itself from the non-performing one by sending a credible signal about its performance to capital markets as well as potential investors.

In terms of decision-making, signaling theory is concerned with understanding why certain signals are dependable and others are not. The theory examines the quality and accuracy of accounting information sent by a business to its users for the purpose of making investment decisions by potential investors. The outcomes of the firm's operating operations are conveyed as signals, which will tell investors about the organization's future possibilities. The hypothesis suggested that managers and shareholders have different levels of access to important information about the businesses' operations. The management have access to some information, whilst the shareholders do not.

3.0 Methodology

The study adopted ex-post factor and correlational research designs. The population of this study consists of all industrial goods manufacturing firms listed on the Nigerian Exchange Group (NGX) as at 31st December 2023 and they are 13 (NGX, 2023). However, for a firm to be selected it must be listed on the Nigerian Exchange /Group market for 2012 to 2023. All data must be available for the period of the study.

Table 3.1 Listed Industrial Goods Manufacturing Firms

SN	Company	Ticker	Date Listed	Date Incorporated
1	Austinlaz & Company Plc	Austinlaz	-	July 13, 1982
2	Berger Paints Plc	Berger	-	Sept. 1, 1959
3	Beta Glass Plc	Betaglass	July 2, 1986	June 2, 1974
4	Cap Plc	Cap	May 24, 1978	Sept. 21, 1965
5	Cutix Plc	Cutix	Aug. 12, 1987	Nov. 4, 1982
6	Dangote Cement Plc	Dangcem	Oct. 26, 2010	Nov. 4, 1992
7	Lafarge Africa Plc	Wapco	Feb. 17, 1979	Feb. 24, 1959

Source NGX, 2024.

Measurement of Variables

The dependent variable financial performance was measured using Return on Asset (ROA) as a proxy this is because it is believed by several scholars such as Chowdhury (2020) to be the most suitable measure of performance of a firm by management in terms of level of asset employed. For the independent variables, firm size (FS) was measured using natural log of total asset (Abbas & Mourouj, 2015), Liquidity (LIQ) was measured as Total Current Assets divide by Total Current Liabilities (Nabeel & Hussain, 2017) and Capital Adequacy (CA) Total Capital (Equity plus Preference) divide by Total Assets (Nabeel & Hussain, 2017).

Table 3.2 Variables Measurement and Definition

Variable	Description	Measurement
ROA _{it}	Return on Assets of firm i at time t	Profit for the period divide by the Total Asset
FS _{it}	Firm Size of firm i at time t	Natural LOG of Total Assets
LIQ _{it}	Liquidity of firm i at time t	Total Current Asset Divide by Total Current Liabilities
CA _{it}	Capital Adequacy of firm i at time t	Total Capital Divide by Total Assets

Source: researcher's compilation, 2024.

Research Model

The theoretical model of the study is stated as:

$$ROA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LIQ_{it} + \beta_3 CA_{it} + \mu_i$$

Where:

ROA_{it} = Return on Assets of firm i at time t,

β_0 = the intercept of the equation,

FS_{it} = Firm Size of firm i at time t,

LIQ_{it} = Liquidity of firm i at time t,

CA_{it} = Capital Adequacy of firm i at time t,

μ_{it} = Error Term.

4.0 Data Presentation

Robustness Test

The study conducted a diagnostic test which include Multicollinearity test, Heteroscedasticity test and Hausman specification tests in order to ascertain the reliability of the statistical regression result. The results from the diagnostics tests are presented below:

Table 4.3 Robustness Test for Model

Variables	Statistics	P-Values
Model		
Hausman Test	6.492	0.0000
R²	0.2437	
Hetest	3.164	0.0000
Mean VIF: Chi2		

Sources: Output generated using STATA 13 (2024)

Multicollinearity Test

The study adopted panel multiple regression model, to measure the association between independent and dependent variables. Where the association is highly correlated, multicollinearity exists. For that, the study tested for multicollinearity, to see that it determines its existence or otherwise. This was done using variance inflation factor (VIF) and tolerance value. Where the variance inflation factor (VIF) and tolerance value are less than 10 and 1 respectively, this signifies the absence of multicollinearity problem associated with the data of the study. Where otherwise, this implies the existence of multicollinearity problem in the data of the study.

Multicollinearity Test Result

Variables	VIF	Tolerance
LIQ	1.59	0.629
FS	1.41	0.709
CA	1.23	0.814
Mean VIF	1.41	

Sources: Output generated using STATA 13 (2024)

Heteroskedasticity Test

The study observations are of different sizes, some in decimal while others are in units. As such, heteroscedasticity sometimes occurs when there is a large difference between the sizes of the observations. For that, the study conducts a Heteroscedasticity test to validate its existence or otherwise. The test is done using Breusch-pagan/cook-Weisberg test for heteroscedasticity. The result of the test reveals a Chi square value of 3.164 with p-value of 0.0000 which is significant at 5% level of significance. This signifies that heteroscedasticity problem exist in the data of this study and to correct this problem the study ran a generalized least square (GLS) model. The presence of Heteroskedasticity in the panel for the models indicate by the Breuch Pagan/cook-Weisberg test for heteroskedasticity χ^2 value of 3.164 with p-value of 0.0000 is significant at 5% level of significance. Thus, the null hypothesis which states that the residual has no constant variance and zero mean is not rejected. Therefore, further post estimated test was conducted to ascertain and correct for the presence of heteroskedasticity.

The result from the Hausman fixed and random effect test model with χ^2 value and 6.492 with p-value 0.000 respectively is statistically insignificant at any level of significance, indicates that the Fixed Effects model is more appropriate than the Random Effects model for this study. Furthermore, there is absence of multicollineality among the explanatory variables, as shown by the mean VIF 1.41 for the model. The decision criterion for the Variance Inflation factor is that a value of 10 and above implies the presence of multicollinearity.

Regression Analysis

A panel regression was conducted using both fixed effects (FE) and random effects (RE) models. The Hausman test ($\chi^2 = 64.92$, $p=0.0000$) suggests that the fixed-effects model is more appropriate. The (R^2 value of 0.2437) coefficient of determination, which is explained around 24% of the total variation in the dependent variable. Hence, the result of R^2 signifies that 24% of total variation in the financial performance measured by ROA is caused by Liquidity, Firm Size, and Capital Adequacy. R^2 value between 0.10 and 0.50 is acceptable when some of the explanatory variables are statistically significant (Ozili, 2023).

Fixed Effects Regression Results

Variables	Coefficient	Z-Value	P-Value	Hypothesis
LIQ	-0.0011	-0.41	0.554	Fail to reject
FS	-0.1627	2.58	0.000*	Reject
CA	-0.0701	-6.21	0.556	Fail to reject
Constant	1.3636	6.86	0.000*	

Sources: Output generated using STATA 13 (2024)

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, Denotes Significance at 1%, 5% & 10%

Testing Hypothesis

H₀₁: Liquidity has no significant effect on the Financial Performance of Listed Manufacturing Firms in Nigeria.

The beta coefficient (β) of Liquidity is negative -0.0011 with a p-value of 0.554 which is statistically insignificant at any level of significance. Fail to reject the null hypothesis. Liquidity does not have a statistically significant effect on financial performance. The null hypothesis was accepted and concluded that Liquidity has insignificant negative effect on firm's financial

performance. In line with the findings of Leszek (2013) that reveal an insignificant effect of current asset structure on performance. This finding is in variance with the findings of the studies of Fathi and Tavakoli (2009), which reveal that current asset structure has a significant effect on performance.

H02: Firm Size has no significant effect on the Financial Performance of Listed Manufacturing firms in Nigeria.

The result of the regression analysis between Firm Size has no significant influence on the Financial Performance of Listed Manufacturing Firms in Nigeria reveals a beta coefficient (β) of firm size is negative -0.1627 with a p-value of 0.000 which is statistically significant at 1% level of significance. The null hypothesis was rejected and it is concluded that Firm Size has a statistically significant negative effect on financial performance, implying that larger firms tend to have lower profitability. This implies that when Firm Size increases will lead to increases in the financial performance of the firm by 5%. This finding is in variance with the findings of the studies of Etukudo, Okoro and John (2022), Firm characteristics (leverage, firm size, liquidity and operating expenses) have a significant effect on return on asset of listed consumer goods firms in Nigeria. Firm characteristics (leverage, firm size, liquidity and operating expenses) have no significant effect on return on equity of listed consumer goods firms in Nigeria. Nangih, Turakpe, and Effe-Nnamdi (2023) finding reveals that firm size has a positive significant effect on Earning per share.

H03: Capital Adequacy has no significant effect on the Financial Performance of Listed Manufacturing Firms in Nigeria.

The beta coefficient (β) of Capital Adequacy is negative -0.0701 with a p-value of 0.5556 which is statistically insignificant. This means that current assets do not have a significant impact on financial performance, failing to reject the null hypothesis. The null hypothesis was accepted and concluded that Capital Adequacy does not have a statistically significant effect on financial performance of manufacturing firms in Nigeria. This finding is in variance with the findings of the studies of Fathi and Tavakoli (2009), which reveal that current asset structure has a significant effect on performance, but is in line with the findings of Leszek (2013) that reveal an insignificant effect of current asset structure on performance.

5.0 Conclusions and Recommendations

This study concluded that interaction between firm size and financial performance was found to be negative that Firm Size (FS) has a significant negative effect on financial performance. The results suggest that larger firms tend to have lower financial performance, which may be due to inefficiencies or higher operational costs associated with large-scale operations. As firm size negatively affects financial performance, companies should implement controlled expansion strategies, ensuring that growth is accompanied by operational efficiencies. It was also found that Liquidity (LIQ) does not have a significant effect on financial performance. The results show an insignificant negative relationship between Liquidity and Return on Assets (ROA), indicating that holding excessive liquidity does not improve financial performance. Also, **Capital Adequacy (CA) does not significantly influence financial performance**, although the correlation analysis suggests a negative relationship, the regression analysis indicates that the effect is not statistically

significant, implying that maintaining a high level of Capital Adequacy does not necessarily lead to better profitability.

- i. Findings reveal that **Firm Size (FS) has a significant negative effect on financial performance of manufacturing firms.** The results suggest that larger firms tend to have lower financial performance, which may be due to inefficiencies or higher operational costs associated with large-scale operations. This study recommends that as firm size negatively affects financial performance, companies should implement controlled expansion strategies, ensuring that growth is accompanied by operational efficiencies. **Manufacturing firms should focus on operational efficiency** rather than size expansion to enhance financial performance.
- ii. The regression results show an insignificant negative relationship between liquidity and return on assets (ROA), indicating that holding excessive liquidity does not improve financial performance. The study recommends that firms should develop strategies to balance liquidity and profitability by investing excess liquidity in productive assets rather than holding excessive cash reserves that do not contribute to profitability.
- iii. Although the correlation analysis suggests a negative relationship, the regression analysis indicates that the effect is not statistically significant, implying that maintaining a high level of Capital Adequacy does not necessarily lead to better profitability. The study suggest that **firms should adopt technology-driven asset management systems** to improve financial performance through enhanced efficiency and resource allocation. **Government and regulatory bodies should create favorable policies** that encourage efficiency in asset utilization among manufacturing firms.

Suggestion for Further Research

The study further suggested that other sectors should be considered such as insurance firm, pension administrators, conglomerate, banks, pharmaceuticals. Moderating or Mediating variable can be introduced such as Ownership structure, Capital structure, and Risk Management.

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