KASU Journal of Accounting Research and Practice (KAJARAP)

Volume 10, Number 2, December, 2025 ISSN: 2360-8889
https://journals.kasu.edu.ng/index.php/accounting

EFFECT OF RISK MANAGEMENT AND FIRMS SIZE ON FINANCIAL PERFORMANCE OF LISTED INDUSTRIAL GOODS FIRMS IN NIGERIA

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Abstract

This study examines effect of risk management and firm size on financial performance of listed industrial goods firms in Nigeria during the periods of 2014 to 2024, where thirteen (13) listed industrial goods firms are considered as the population of the study, and the entire industrial goods firms are considered as the sample based on census sampling technique. A correlational and ex-post factor research design is employed for the study. A multiple regression technique is considered suitable to analyze the secondary unbalanced panel data extracted from the annual audited financial statement of the sampled firms, with the aid of STATA 13 version. The study discovered that financial leverage and liquidity have positive and significant effect on financial performance of listed industrial goods firms in Nigeria. On the other hand, firm size has no significant effect on financial performance of listed industrial goods firms in Nigeria. Therefore, it recommends that management should initiate optimal financial leverage strategies towards encouraging firms to adopt more prudence debt financing strategies as the need arise for the business expansion and growth which would ultimately improve the financial performance of the listed industrial good firms in Nigeria. Also, the management should also emphasize on optimizing working capital utilization by reducing inventory levels, managing account receivable and payable, investing in new projects and growth as well as improving supply chain efficiency, to enhance financial performance of the listed industrial goods firms in Nigeria.

Keywords: risk management, firm size, financial performance, listed industrial goods firms, Nigeria

1. Introduction

A firm's financial performance has been a subject of discussion among scholars and practitioners. Therefore, financial performance is used for measuring the wellbeing of business entities. Meanwhile financial performance is essentially viewed as the outcome of the entire financial activities of business operation. Although, Panigrahi (2019) sees financial performance as the measure of the overall financial wellbeing of an organization, while Bener et al. (2020) emphasize that financial performance analysis is an effective

criterion for assessing the achievement of an organisation's established objectives and goals, which can be compared with the current market conditions as a basis of business analysis.

Saliha (2021) expresses that financial performance signifies the financial well-being of business for particular periods of time, which can be measured with financial ratios such as profitability ratios, solvency ratios among others. Nevertheless, International Actuarial Institution (IAI) (2016) believes that financial performance of an organization discloses the manner and extend at which the organization manages and control its resources.

It is pertinent that risk management is an essential tool for effective business operation. Therefore, managers deemed it necessary to come up with robust policies and strategies on risk assessment and control at every level of an organization towards ensuring smooth and save business operation which often impact on the survival and growth of the organisation financially.

According to Ozturk (2017), risk management is the process by which managers satisfy their risk-taking needs by identifying key risks, obtaining consistent, understandable, operational risk measures, choosing which risks to reduce, which to increase, by what means and establishing procedures to monitor the risk position. Nzotta (2022), defines risk as the exposure of loss arising from variation between the expected and actual outcome of investment activities. On the other hand, Raghavan (2023), risk management refers to the practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce the risk. Whereas, Pandey (2024), sees risk management as an identification, analysis and response to potential unfavorable occurrence factors that form part of the life of a business.

Financial leverage entails the utilization of borrowed funds as an alternative means of expansion in the capital or financial structure of an organisation. Thus, debt financing offers numerous benefits for corporate operations, such as a stable interest rate, enhanced financial maneuverability, and tax deductions (Santos et al., 2023). The appropriate level of debt a company employs to establish an optimal capital structure significantly impacts its financial performance (Akhtar et al., 2021). Debt financing management as aspect of risk management has an influence on financial performance, in an ordinary business operation. Thus, series of studies are conducted to examine the link between the financial leverage and financial performance from various contexts.

Similarly, liquidity is considered as another important aspect of risk management that affect the performance and value of an organisation. Therefore, high liquidity ensures that a company can easily pay off its current liabilities such as accounts payable and short-term debt. It is commonly measured using ratios like the current ratio, quick ratio, and cash ratio. According to David (2024), liquidity basically describes how quickly an asset can be converted to cash. He further considered liquidity as a measure of the extent to which a person or organization has cash to meet immediate and short-term obligations.

Firm's size is often considered as a representation of business capacity in relation to its capital based, which often determine the growth and performance of business operation. Lopez et al., (2016) argue that there is a connection between firm's size and financial performance, since the degree of the indebtedness and leverages of business

operation is ascertained by its size of capital base. Papadogona (2006), conducted a study titled the financial performance of large and small firms' evidence from Greek. He revealed that there is a relationship between firm's size and financial performance considering the managerial efficiency, debt structure and investment fixed assets and sales growth.

Considering the vital role of industrial goods firms on the economic growth and development in Nigeria, this study seeks to examine the effect of risk management and firm size on financial performance of listed industrial good firms in Nigeria, where risk management is considered as the independent variable of the study that is peroxided by liquidity (LDT), financial leverage (FLV) and firm size (FSZ), while the dependent variable is represented by financial performance and measured by return on assets (ROA).

It is certain that the Nigerian industrial good firms were among active manufacturing sector over the years due to effective and efficient management of resources towards ensuring growth and the survival of their businesses. In the recent time, a wider variation has been discovered in their internal performance indices as compare to the previous years. Mmemek and Etim (2023) reported that financial performance of industrial good firms particularly cement industry has dropped from 2014 - 2016 by 8%. Though, this variation was attributed to some local operational challenges such as financial risk management challenges which ultimately affect the performance of the industrial good firms financially. It is therefore, asserted by Asoko (2023), that companies with sense of risk management such as ability to structure their cost, pay trade creditors and service their loans, ensure adequate return on shareholders and attract investors are more likely to perform better financially.

According to Ali and Hussin (2016), report that the management of industrial goods firms in Nigeria, often neglect risk management policies in their business operations, by assessing their financial leverage, operating leverage, working capital and liquidity among others. Other studies have been conducted by different scholars on similar subject matter in different sectors internationally, such as the study of risk management on financial performance in banking industries by Santika et al., (2022), on the influence of liquidity management on financial performance of commercial banks in Kenya by Edwin et al., (2023).

The study of risk management practices and company financial performance from cement sector of Pakistan by Hussin and Ali (2016), whereas few were conducted in Nigeria but in a different sectors such as the study of liquidity and operational risk on financial performance of listed deposit money banks in Nigeria by Abubakar and Peter (2021), the impact of risk management on financial performance of banking sector by Bilal (2021), the study of effectiveness of risk management system on financial performance in public Setting by Wadesango et al., (2014), to mention few among others.

Considering all these studies, none of the previous studies was conducted under the Nigerian industrial goods subsector covering the periods of 2014-2024. Also, to the best knowledge of the researcher's knowledge none of the previous study had jointly examined the effect of risk management and firms' size in relation to financial performance. Meanwhile, this study seeks to investigate the effect of risk management and firm size on financial performance of listed industrial goods firms in Nigeria covering the periods of 2014-2024. Thus, the following questions shall be raised and answered;

i. How does financial leverage affect financial performance of listed industrial good firms in Nigeria?
ii. In what way does liquidity affect the financial performance of listed industrial good firms in Nigeria?
iii. Does firm size influences financial performance of listed industrial good firms in Nigeria?

The main objective of this study is to examine the relationship between risk management and firm size on financial performance of listed industrial good firms in Nigeria. While specific objectives are to:

i. Determine the effect of financial leverage on financial performance of listed industrial good firms in Nigeria.
ii. Evaluate the effect of liquidity on financial performance of listed industrial good firms in Nigeria.
iii. Identify the effect of firm's size on financial performance of listed industrial good firms in Nigeria.

Based on the objectives of this study, hypotheses were formulated in null forms as:

H_{01}: Financial leverage has no significant effect on financial performance of listed industrial good firms in Nigeria.

H_{02}: Liquidity has no significant effect on financial performance of listed industrial good firms in Nigeria.

H_{03}: Firm's size has no significant effect on financial performance of listed industrial good firms in Nigeria.

The study aims at examining the relationship between risk management and firm size on financial performance of listed industrial good firms in Nigeria between the periods of (2014-2024). The period was chosen knowingly that the problem has been occurring over the years. The study considered financial performance which is peroxided by return on asset (ROA) as the dependent variable. While the independent variable is represented by risk management and peroxided by liquidity (LDT), financial leverage (FL) and firm's size (FSZ) respectively.

The outcomes of this study will be beneficial to the management of the listed industrial good firms in Nigeria. Hence, they can rely on the outcomes in making decisions on risk management and control for the survival of their companies based on their established objectives. Also, researchers and students can benefit from the outcomes of this study, as it can serve as a basis of reference in their studies, which would further contribute to the existing knowledge in the field of finance and accounting.

The Government can use the findings of the study as source of data for the purpose of tax assessments. The study findings will be of utmost benefit to potential investors as a source of information that enables them determine the strength and weakness of the companies, which would assist in making an informed decision to overcome about the activities of the industrial goods firms in Nigeria as far as risk management and financial performance are concern.

2. Literature Review

This section of the study focuses on the reviews of the empirical studies of variables used in the study which include the dependent variable represented by financial performance and independent variables represented by risk management (leverage and liquidity) and firm size respectively.

Financial leverage and financial performance

Tani and Abubakar (2012), studies the impact of working capital management policy and financial leverage on financial performance of listed companies in Amman stock exchange in Jordan, for the period of 2005-2010 using the population of 45 companies. Secondary data were collected which was analyzed using multiple regression. The results of the study indicated that working capital management policy and financial leverage have a significant impact on financial performance of listed companies in Amman stock exchange in Jordan. Nevertheless, if another similar study would be conducted in Nigeria focusing on industrial good firms for the periods of 2014 to 2024, the outcome may change.

Abubakar (2015) investigates the relationship between financial leverage and financial performance of deposit money banks in Nigeria, for the period of 2005-2013 using the population of 11 deposit money banks. The study uses secondary data which was analyzed using descriptive and correlation technique of analysis. The findings from the correlation analysis revealed that there is a significant relationship between financial leverage and financial performance. Though, there is need to carry the same investigation in Nigeria considering industrial good firms for the period of 2014-2024.

Bhayani et al., (2018), study the relationship between financial leverage and firms' performance of selected pharmaceutical companies in India, for the period of 2012-2017 using the population of five (5) companies. The study uses secondary data which was analyzed using multiple regression tools of analysis. The study explained that financial leverage has an insignificant impact on financial performance and valuation of firms. Although, there is need to look at Nigerian industrial good firms between the periods of year 2014 to 2024 on the same subject matter.

Lopez (2018), examines the relationship between financial leverage and financial performance of 47 consumer's good firms in Portugal for a period of 2011-2013. Secondary data was collected for the study which was analyzed using multiple regressions. The results of the analysis show a positive significant relationship between financial leverage and financial performance at 1% level of significance. It is pertinent to examine the same subject matter in the industrial good firms of Nigeria for the period of 2014-2024 to see the outcome.

Afolabi et al. (2019), examine the relationship between financial leverage and financial performance of Nigerian firms, for the periods of 2007-2016, using the population of 10 firms. The study adopted ex-post factor research design using secondary panel data which was analyzed using multiple regression technique of analysis. The results of the analysis showed a positive and significant effect between financial leverage and financial performance. Meanwhile, there is need to conduct a similar study in Nigerian industrial good firms for the periods between 2014 to 2024.

Richard et al. (2023) examined the impact of financial leverage on financial performance of listed firms on Tokyo's stock exchange, for the period between 2000-2001. The study selected 257 automotive, construction, electronics, metal and telecommunications companies. The study uses secondary data which was analyzed using the random effect. The study found that interest coverage has a positive and statistically significant effect on ROA, ROE and Tobin's Q. Therefore, there may be a change in the outcome if the same examination is conducted on the same subject matter in Nigeria considering the industrial good firms for the period of 2014-2024.

Liquidity risk and financial performance

Kartal (2016), examined the effect of liquidity on financial performance of Turkish retail industry for the period of 1998-2015 using the population 12 retail industries. The study uses secondary data which was analyzed using multiple regressions. The results of the analysis reveal a significantly positive relationship between liquidity and financial performance. Also, there is need to examine the Nigerian listed industrial good firms with regards to the subject matter between the periods of year 2014 to 2024.

Onyekwelu et al. (2018), investigate the effect of liquidity on financial performance of deposit money banks in Nigeria using the population of five (5) banks for the period of 2007-2016. Secondary data were collected for the study which was analyzed using multiple regressions of analysis. The results of the study show that liquidity has positive and significant effect on banks profitability ratios and that liquidity also has positive and significant effect on return on capital employed. Therefore, there is need for similar investigation on the same subject matter in the Nigerian listed industrial good firms for the period of 2014-2024 is crucial.

Ratemo et al., (2021), investigates the influence of liquidity risk on financial performance of commercial banks in Kenya for the period of 2007-2008 using the population of 42 commercial banks operating in Kenya. Secondary data were employed in the study which was analyzed using multiple regression tools of analysis of the study. The result of the analysis reveals that liquidity risk has negative effect on financial performance of commercial banks in Kenya. Consequently, if another investigation would be conducted in Nigeria focusing on industrial good firms for the periods of 2014 to 2024, the outcome may change. Muliro et al., (2023), examine the effect of liquidity risk management on financial performance of Kenyan commercial banks, for the period of 2010- 2019 using the population of 32 commercial banks in Kenya. The study employed panel data using E-views as a tool of analysis. The study findings revealed that liquidity risk management had an insignificant negative relationship with ROE ($F=0.583912$, $P<.05$) and ROA ($F=2.770410$, $P<0.5$). For that reason, findings may differ if similar study would be conducted in Nigerian industrial good for the periods of 2014 to 2024.

Alim, et al. (2023), studied the effect of liquidity risk management on financial performance of commercial banks in Pakistan for the period of 2006-2019. The study uses secondary data which was analyzed using ordinary least square analysis. The study concluded higher liquidity increases banks performance in commercial banks of Pakistan. However, there is need to conduct a similar study in Nigerian industrial good firms for the periods of 2014 to 2024.

Firm size and financial performance

Philip (2013), studied the relationship between firm size and financial performance of commercial banks in Kenya, for the period of 1998-2012 using the population of 43 commercial banks. The study uses secondary data which was analyzed using correlation and regression statistics. The findings of the study indicate that there is significant relationship between firm size and financial performance. Consequently, if another study on the relationship between firm size and financial performance would be conducted in Nigeria focusing on industrial good firm for the periods of 2014 to 2024, the findings may change.

Also, Foyeke et al. (2015), investigate the relationship between firm's size and financial performance of financial and non-financial sectors in Nigeria, using the population of 137 companies for the period of 2009-2019. The study uses secondary data which was analyzed using the weighted logistic regression method of analysis. The findings of the study indicated that there is a significant positive relationship between firm's size and financial performance. Therefore, there may be a change in the findings if the same examination is conducted on the same subject matter in Nigeria considering the listed industrial good firms for the period of 2014-2024.

Similarly, Sritharan et al. (2015), examined firm size influence on firms' profitability of listed firms of Srilankan hotels and travel sector, using the population of 30 firms for the period of 2008-2012. The study performed fixed and random econometric estimation mode and used secondary data. The result of the study reveals that firm size is positively related to firm profitability. Although, there is need to look at Nigerian industrial good firm taking the periods of 2014 to 2024 in to consideration on the same subject matter.

On the other hand, Olawale et al., (2017), investigate the effect of firm size on financial performance of firms in Nigeria for the period of 2005-2013 using the population of 12 non-financial firms operating in Nigeria. The panel data used for the study are analyzed using pooled regressions model, fixed effect model and random effect model to identify the relationship between firm size and financial performance. The results of the study reveal that firm size in terms of total assets has a negative effect on financial performance, while in terms of total sales; firm size has a positive effect on financial performance of Nigerian non-financial companies. Meanwhile, for the purpose of results comparison similar study would be conducted on the same subject matter in Nigerian listed industrial for the period of 2014-2024.

Muhindi et al., (2018), studied the effect of firm's size on financial performance of commercial banks in Kenya, using the population of 42 registered commercial banks in Kenya, for the period of 2012-2016. The study uses secondary data which was analyzed using multiple regression tools of analysis. The results of the study indicated that there is a positive relationship between firm's size and financial performance of commercial banks in Kenya. However, there is need to conduct a study on similar subject matter in Nigerian industrial good firms, for the periods of 2014 to 2024.

Review of Related Theories

This study reviewed pecking order, liquidity asset or Liquidity-Adjusted Capital Asset Pricing Model (LCAPM) and the Resources-Based View (RBV) theories, to anchor

the variables of the study namely: leverage, liquidity, firm size and financial performance respectively.

Pecking Order Theory

In contrast to the trade-off theory, the pecking order theory does not suggest a target leverage ratio that firms should aim in order to improve performance. Donaldson (1961) founded the pecking order theory when he conducted an interview survey of 25 large United States firms, and concluded that management strongly prefers to use internal source of funds over external sources, unless internal sources are not available.

Myers (1984) and Myers and Majluf (1984), provided a theoretical justification of Donaldson's (1961) results. They argued that information plays a pivotal role on debt-equity choice decision of managers and investors. They maintained that managers will hesitate to issue equity if they feel that it is undervalued by the market, and investors too are aware that managers will hesitate to issue new equity when it is underpriced. Thus, both managers and investors react according to information available to them.

Based on this argument, if managers tend to issue undervalued equity (low priced equity), the wealth will be transferred to the investors against the shareholders' benefits and wealth. In this situation, internal funds and debt will be preferred to equity. Myers (1984) referred to this as the 'pecking order theory' of financing. The theory states that firms prefer to finance new investment first internally with retained earnings, second with debt, and by issuing new equity as last resort. Pecking order theory suggests that there is no well-defined optimal leverage, because there two kinds of equity, internal and external, one at the top of the pecking order and one at the bottom.

Liquidity-Adjusted Capital Asset Pricing Model (LCAPM)

This theory was introduced by Yakov Amihud and Haim Mendelson in (1986). This theory stated that the expected return on asset is inversely related to it liquidity. The expected return on asset is a function of its systematic market risk, liquidity risk, and the investor's risk aversion. They further advocate that more liquid assets (e.g., easily tradable, low transaction cost) will have lower expected returns.

Also, less liquid assets (e.g., difficult to trade, high transaction cost) will have higher expected returns to compensate for the increased liquidity risk. This theory best fit the aspect of liquidity of this study on financial performance because it incorporates liquidity risk into the asset pricing framework. It posits that liquidity is a key factor in determining asset returns and that investors demand a premium for holding fewer liquid assets. The LCAPM theory or model is well suited to explain the impact of liquidity risk on financial performance because it accounts for liquidity risk in asset pricing, provide a framework for measuring liquidity, offers insight into the tradeoff liquidity between liquidity risk and financial performance and explain the relationship between liquidity and expected returns.

Resources-Based View (RBV) Theory

This theory was proposed by Jay Barney (1991), the theory suggest that a firm's internal resources and capabilities are the primary drivers of its sustained comparative advantage and financial performance considering it resources which include valuable assets like human, physical and organizational resources. Resources-Based View Theory argues that firms should focus on developing and leveraging their unique resources and

capabilities to achieve sustained comparative advantage and superior financial performance.

Following the review of the related theories, the research considered pecking order theory as one of the underpinning theories is because it proposes a straightforward, hierarchical approach to financing by prioritizing internal funds then debt and lastly equity. This theory reflects managerial behavior showing how managers often make financing decisions, preferring to use internal funds such as retain earnings and debt before issuing equity. Also, The LCAPM theory best fit the aspect of liquidity of this study on financial performance because it incorporates liquidity risk into the asset pricing framework. Finally, Resources-Based Review theory is reviewed in the study to aid the variable of firm size.

3. Methodology

The study adopted a correlational and ex-post factor research design. The study considered the appropriateness of the correlational research design since, the study seeks to establish relationship between the variables of the independent variables and the dependent variables respectively. Also, the ex-post factor research design is considered appropriate for the study since the data were extracted through historical financial records of the organisations. The population of the study covers 13 listed industrial goods firms and census sampling techniques is considered appropriate because the study comprehensively covers all the listed industrial good firms in the Nigerian Exchange Group (NGX) as at 31st December 2024 as shown below:

Table 1

Population of the study

S/N	Study population (13)	Sample Selected (13)	Date Incorporated
1	Austin laz & company plc	Austin laz & company plc	July 13, 1982
2	Berger paint plc	Berger paint plc	September 1, 1959
3	Beta glass plc	Beta glass plc	June 2, 1974
4	Bua cement plc	Bua cement plc	May 30, 2014
5	CAP plc	CAP plc	September 21, 1965
6	Cutix plc	Cutix plc	November 4, 1982
7	Dangote cement plc	Dangote cement plc	November 4, 1992
8	Greif Nigeria plc	Greif Nigeria plc	January 20, 1940
9	Lafarge Africa plc	Lafarge Africa plc	February 24, 1959
10	Meyer plc	Meyer plc	May 20, 1960
11	Notore chemical ind plc	Notore chemical ind plc	November 30, 2005
12	Premier paints plc	Premier paints plc	August 24, 1982
13	Tripple gee and company plc	Tripple gee and company plc	April 14, 1980

Source: Nigeria Exchange Group (NGX), 2024 (www.ngxgroup.com)

The study used secondary data of ten years from (2014-2024) which was obtained from the annual reports and accounts of the listed industrial good firms in Nigeria. Secondary data is considered appropriate for the study due to the quantitative nature of data of the study as well as the variables used for the study. Also, these published annual reports and accounts were extracted from the website of the Nigerian Exchange Group (NGX).

The study adopted multiple regressions as the techniques of the analysis of the secondary data collected for the study. Multiple regressions are chosen to enable the researcher examines the effect of independent variable (risk management) on the dependent variable (financial performance) of listed industrial good firms in Nigeria.

Variable Measurement

This shows the definitions, measurement and sources of the dependent and independent variables of the study as:

Table 2

Variable Definition, Measurement and Sources

Variables	Acronyms	Definition	Measurement	Source
Dependent				
Return on Asset	ROA	Financial performance is a formal business effort often carried out to generate profits, in order to ensure the growth and sustainability of the business operation.	Net Income B/4 Interest and Tax/Total Asset	Ali and Hussin (2016)
Independent				
Financial Leverage	FLV	Financial leverage is the degree of debt financing such as loans and other debt obligations for expansion purpose by the business owners.	Total debt/Total equity	Bui (2020)
Liquidity	LDT	Liquidity is extend of cash available to meet their financial obligations as they fall due.	Current Assets/Current Liabilities	Li (2020)
Firm size	FSZ	Firm size is a scale of company's operating capacity which is determined by various factors like total assets value, sales revenue, number of employees as well as the volume of businesses.	Natural log of Total Assets	Olalekan and Adeyinka (2013)

Source: Compiled by the Researcher, 2024

Model Specification

The study adopted the model of (Ali and Hussin, 2016) $ROA = \beta_0 + \beta_1 WCR + \beta_2 FR + \beta_3 OPL + e$ and modified to accommodate the risk management proxies and financial performance as: $ROA_{it} = \beta_0 + \beta_1 FLV_{it} + \beta_2 LDT_{it} + \beta_3 FSZ_{it} + e_{it}$

Where: ROA = Financial Performance**;** i = Sample Firms**;** t = Time Series**;** β_0 = Constant **;** $\beta_1 - \beta_3$ = The regression model coefficient of the independent variables**;** FLV = Financial Leverage; LDT = Liquidity; FSZ = Firm size; e = Error term.

4. Result And Discussions

These consist of descriptive statistics results, correlation matrix results and regression results of the study, as well as policy implications of the findings.

Table 4
Descriptive Statistic

Variables	Obs	Mean	Standard Dev	Min	Max
ROA	129	0.1717	0.2407	0.0001	0.7952
FLV	129	0.8969	0.4574	0.0036	0.6559
LDT	129	0.4248	18.8991	0.0239	0.6302
FSZ	129	15.88979	2.4542	11.5682	21.1746

Source: STATA output, 2024

Table 3 contains the descriptive statistic result of the explanatory and explained variable of the study. A total of 129 are presented as the observation of the study as against the actual observation of 143, which is due to missing data from some of the firms namely; BUA Plc between 2014-2017, Grief Plc between 2022-2023, Meryer Plc in 2014, Notore between 2014-2016, and 2024 as well as Premier paint between 2021-2023 respectively. Meanwhile, these resulted to the unbalanced panel data set. It is observed that Return on Assets (ROA) being the dependent variable of the study maintains an estimated mean value of 0.17 with a corresponding estimated standards deviation value of 0.24 as well as the minimum and maximum values of 0.000 and 0.795 respectively. This signifies that the highest and least rates of ROA 79% and 0.000 respectively as far as the Nigerian listed industrial goods firms in Nigeria are concern. And the estimated 17% has been considered as the normal rate of the ROA.

On the other hand, financial leverage (FLV) has an average value of 0.90 with standard deviation value of 4.46. This outcome shows the normality of the data used, since there is no dispersion in the data which ranges from the minimum of 0.0036 to maximum of 0.6559 respectively. Then, the Liquidity (LDT) has minimum and maximum values of 0.0239 and 0.6302, with an average value of 0.42 and corresponding standard deviation value of 0.40. This shows that there is no dispersion in the data used, which also signifies normality of the data. It is also found that Firm size (FSZ) has an average value of 15.869 and corresponding standard deviation value of 2.4123, with a minimum and maximum values that range between 11.568 to 21.175 respectively.

Table 5
Correlation Matrix

	ROA	FLV	LDT	FSZ
ROA	1			
FLV	0.0366	1		
	0.6806			
LDT	0.1095	0.079	1	
	0.2167	0.3738		
FSZ	0.2330*	0.1891*	0.1101	1
	0.0079	0.0319	0.214	

Source: STATA Output, 2024

Table 5 reveals that there is a relatively weak positive and significant correlation among ROA and other variables namely; Financial leverage (FLV), Liquidity (LDT), and Firm Size (FSZ) respectively, based on coefficient value of 0.0366, 0.1095 and 0.2330 and P- value of 0.6806, 0.2167, and 0.0079 respectively. Moreover, there is no high correlation amongst the independent variables themselves which include the coefficient value of 0.0790, 0.1891 as well as 0.1101 respectively, which implies that the variables are free from multicollinearity problem that may affect the outcome of the regression result. Though, this may not be enough to conclude that there is no harmful multicollinearity exists among the independent variables of the study until the Variance Inflation Factor (VIF) and the Tolerance Values (1/VIF) are found not exceeding the expected limit or ranges of values specified by their rules of thumbs, being an advanced technique for measuring multicollinearity between the regressors.

Table 6
Summary of Multicollinearity Test

Variables	**VIF**	**1/VIF**
FLV	1.05	0.9485
LDT	1.05	0.9542
FSZ	1.02	0.9776

Source: STATA output, 2024

As shown in table 5. The Variance Inflator Factor (VIF) of the variables are within the acceptable range of higher than 1 but less than 10 that is, an indication of absence of multicollinearity problem among all the variables which is further confirmed by the overall mean VIF of 1.05. Similarly, the Tolerance Values (1/VIF) is within the accepted range of

greater than zero 0 but less than 1, which further displace evidence that the explanatory variables in the model of the study are appropriate and fit.

Table 7

Summary of Heteroskedasticity Test

Model	Chi2	Prob>Chi s
Heteroskedasticity	67.29	0.000

Source: STATA output, 2024.

From Table 7, the P- value of the heteroskedasticity is significant at 0.000% with a correspondent chi square value 67.29%, which suggests that there is presence of heteroskedasticity in the model of the study. Since, there is no equal spread of data across the error terms of the model. Therefore, there is need for rectifying heterogeneity problem through the post estimation analyses. The heteroskedasticity is found in the appendix B.

Table 8

Summary of Post Estimation Results

Model	Chi2	Prob>Chi s
Hausman Test	4.89	0.1802
L.M Test	26.68	0.000

Source: STATA output, 2024.

The Hausman specification test shows an insignificant P-value of 0.1802 and a corresponding Chi2 value of 4.89. This further suggested for Lagrangian Multiplier Test (L.M Test) as another advance technique to enables the researcher determines the best model to be used in interpreting the results of the study. Meanwhile, the test revealed significant value P-value of 0.00 and a corresponding Chi2 of 26.68, which proposed for Generalized Least Square (GLS), being an advanced technique that best interpret the model of the study as the last option. The post estimation results are found in the appendix B.

Table 9

Summary of Random Effect GLS Regression Result

Variables	Coefficient	Z- Value	P-Value
FLV	0.0031	2.15	0.031
LDT	0.0008	4.13	0.000
FSZ	0.0294	1.74	0.082
R^2			0.18
Adj- R^2			0.07
F- Stat			3.73
F-Sig			0.000

Source: STATA output, (2023)

Table 9, unveils the summary of the Generalized Least Square (GLS) post regression results of model employed for the study. Also interpretations are made based on the results generated in lined with established post estimation tests assumptions; Best Linear Unbiased Estimators "BLUE" towards ensuring valid and reliable inferences are established from outcome of the study.

The multiple coefficients of determination also known as cumulative R^2 of (0.18) in the model, represents the percentage of the variation in dependent variable that are jointly explained by the explanatory variables of the model, while, the remaining 82% are explained by other factors not considered in the model of the study. While, the F- Stat and F- Sig values are (3.73) and (0.000) respectively. And justify the fitness of the model employed for the study

Test of Hypotheses

The hypotheses tests of the study are drawn from the summary results of the GLS post regression analysis from table 9 of the study.

H_{01}: Financial leverage has no significant effect on financial performance of listed industrial good firms in Nigeria.

From table 9, it shows that financial leverage has a positive coefficient value of 0.0030 and p- value of 0.031 which is significant at 5%. This implies that for every ₦1 increase in financial leverage profile, there would be an increase in financial performance of listed industrial goods firms in Nigeria by almost 1%. This therefore, provides evidence for not accept the null hypothesis which states that financial leverage has no significant effect on ROA of listed industrial god firms in Nigeria

H_{02}: liquidity has no significant effect on financial performance of listed industrial good firms in Nigeria.

The table 9 also, reveals liquidity with a positive coefficient value of 0.0008 and p-value of 0.000 at 1% level of significant. This signifies that an additional ₦1 increase in liquidity of the sampled industrial goods firms would amount to an increase in financial performance of listed industrial goods firms in Nigeria by almost 1%. That further suggest for not accepting the null hypothesis which states that liquidity has no significant effect on ROA of listed industrial good firms in Nigeria.

H_{03}: Firm size has no significant effect on financial performance of listed industrial good firms in Nigeria.

The table 9 has shown that firm size has a positive coefficient value of 0.0294 and insignificant p-value of 0.082. Therefore, any additional unit increase in firm size, would have no effect on the financial performance of the listed industrial goods firms in Nigeria. Meanwhile, it shows that the null hypothesis which states that firm size has no significant effect on ROA of listed industrial good firms in Nigeria is failed to be rejected.

5. Conclusion and Recommendations

Sequel to the outcome of the study, it is discovered that financial leverage and liquidity have positive and significant effect on financial performance of listed industrial goods firms in Nigeria. On the other hand, firm size has no significant effect on financial performance of listed industrial goods firms in Nigeria. Therefore, it recommends that

management should initiate optimal financial leverage strategies towards encouraging firms to adopt more prudence debt financing strategies as the need arise for the business expansion and growth which would ultimately improve the financial performance of the listed industrial good firms in Nigeria.

Also, the management should also emphasize on optimizing working capital utilization by reducing inventory levels, managing account receivable and payable, investing in new projects and growth as well as improving supply chain efficiency, to enhance financial performance of the listed industrial goods firms in Nigeria.

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