

Effect of Firm Size on Performance of Quoted Real Sector Firms in Nigeria: A Panel Analysis

Running title: Firm Size and Performance of Quoted Real Sector Firms in Nigeria

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ABSTRACT

This paper examines how firm size influences the performance of quoted real sector companies in Nigeria. Total assets, total sales, and total equity are used to proxy firm size, whereas return on assets (ROA) is used to measure firm performance. The ex-post facto research design was used, and panel data were collected from four firms listed on the Nigerian Exchange Group during the years 2011–2025. Audited annual reports were used to obtain data, and panel regression methods were used to analyze the data. The adoption of the random effects model was made based on the results of the Hausman test. The results show that total assets have a negative but significant influence on ROA, whereas total sales have a positive yet non-significant influence on ROA. Conversely, total equity shows a positive and significant effect on ROA. The research finds that the impact of firm size on the performance of firms is mixed but significant. Accordingly, it recommends increased use of assets, better policies for revenue-generation growth, and effective use of equity as instruments for fortifying firm performance.

Keywords: Firm Size; Total Assets; Total Sales; Total Equity; Real Sector Performance; Return on Assets

Subject Categories: Corporate Finance; Accounting; Real Sector Economics

1. INTRODUCTION

Firm performance is of paramount importance to investors, owners, management, and other stakeholders. No organization, including firms within the real sector, can sustain its operations without satisfactory performance, whether financial or non-financial. A well-performing firm is capable of generating substantial and sustainable returns for investors, enhancing shareholders' wealth, and ensuring long-term survival in a highly competitive business environment. According to Uremadu (2012), as cited in Nangih et al. (2023), improved firm performance enhances employee income, ensures the delivery of higher-quality products to customers, and promotes environmentally sustainable production processes. Managers, therefore, continually strive to achieve efficiency and optimal performance in order to maximize profitability, increase shareholders' wealth, and guarantee organizational survival. This is accomplished through effective planning, organization, and control of organizational resources, including human and material inputs (Nangih et al., 2023). For the purpose of this study, return on assets (ROA) has been chosen as the most suitable indicator for measuring performance, given its exhaustive uniqueness in determining returns on all the capital employed.

The real sector of the Nigerian economy encompasses all activities undertaken by individuals, private entities, and corporate organizations engaged in the production of tangible and tradable goods. It is broadly categorized into agriculture, industry, building and construction, wholesale and retail trade, and services (CBN, 2019). This sector is vital as it drives the attainment of macroeconomic objectives and fosters economic growth by serving as the productive base of the economy.

Empirically, data from the National Bureau of Statistics (2025) indicate that the manufacturing sector contributed approximately 8–9% to Nigeria's GDP over the period 2019 to 2025, with its share declining to about 8.05% in 2025. The agricultural sector has remained a leading contributor to Nigeria's GDP, accounting for approximately 22–25% in recent years, while the industrial sector has contributed roughly 18–20%, reflecting a modest decline in its relative share (National Bureau of Statistics, 2025). The external trade sector continues to account for about 12–15% of GDP, whereas the construction sector has maintained a relatively small contribution, averaging between 3% and 4% over the period 2019 to 2025 (National Bureau of Statistics, 2025).

Firm size is conceptualized as the scale and diversity of a firm's productive capacity and service offerings (Shaheen & Malik, 2012). It plays a critical role in shaping both internal operations and external relationships. In contemporary business environments, firm size is a key determinant of competitiveness, largely due to economies of scale. Larger firms are able to reduce production costs and expand market share, thereby gaining a competitive advantage over smaller firms (Olawale et al., 2017). Understanding the relationship between firm size and real sector performance is essential, as it provides insights into the drivers of organizational success. These drivers include, but are not limited to, sales volume, workforce size, capital base, and asset holdings.

1.1 Statement of the Problem

Size is observed as a major determinant of performance in any firm. It has always been the objective of firms to multiply in size in order to have an edge over their competitors. The positive relation between size and performance is theoretically explained by economies of scale.

Previous studies have predominantly measured firm size using total assets and total sales (Adamu, 2019; Aduralere, 2019; Olawale, Ilo, & Lawal, 2017; Aza, 2018; Egbuhuzor & Wokeh, 2022; Cuong et al., 2021). However, the distinct contribution of this study lies in the inclusion of total equity as an additional proxy for firm size. Panel data spanning fifteen (15) years from 2011 to 2025 was considered to provide robust empirical evidence on the long-run effects of firm size, measured by total assets, total sales, and total equity, on the performance of real sector firms in Nigeria.

In view of the foregoing, this study undertakes an empirical analysis of the influence of firm size on real sector performance, focusing on firms quoted on the Nigerian Exchange Group (NGX).

1.2 Objectives of the Study

The specific objectives are to:

- i. Evaluate the effect of total assets on the return on assets of quoted real sector firms in Nigeria.
- ii. Ascertain the effect of total sales on the return on assets of quoted real sector firms in Nigeria.
- iii. Determine the effect of total equity on the return on assets of quoted real sector firms in Nigeria.

1.3 Research Questions

- i. What is the effect of total assets on the return on assets of quoted real sector firms in Nigeria?
- ii. What is the effect of total sales on the return on assets of quoted real sector firms in Nigeria?
- iii. What is the effect of total equity on the return on assets of quoted real sector firms in Nigeria?

1.4 Statement of Hypotheses

Based on the specific objectives, the following hypotheses were formulated and stated in the null:

- i. Total assets have no significant effect on the return on assets of quoted real sector firms in Nigeria.
- ii. Total sales have no significant effect on the return on assets of quoted real sector firms in Nigeria.
- iii. Total equity has no significant effect on the return on assets of quoted real sector firms in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

Firm Size

Firm size is widely recognized in the literature as a critical determinant of firm performance, particularly due to the role of economies of scale, which enable larger firms to reduce average costs and improve efficiency (OECD, 2021). Larger firms are often able to spread fixed costs over a greater level of output, thereby achieving cost advantages over smaller firms. Firm size can be conceptualized as the scale of a firm's operations, including its production capacity, resource base, and market reach. According to Shaheen and Malik (2012), firm size reflects the quantity and diversity of productive resources and the range of goods and services a firm can provide simultaneously to its customers. More recent studies emphasize that firm size also captures organizational complexity, financial strength, and strategic positioning (World Bank, 2022). In practical terms, firm size is commonly measured using proxies such as total assets, total sales (revenue), and shareholders' equity. These indicators reflect the scale of operations and financial capacity of firms (Meiryani et al., 2020; International Financial Reporting Standards Foundation, 2023). Firms with larger asset bases are generally perceived to have better growth prospects, greater access to financing, and higher stability during economic fluctuations (IMF, 2023). Empirical evidence suggests that larger firms tend to exhibit higher profitability due to operational efficiencies, improved bargaining power, and easier access to capital markets, although this relationship may vary across industries and institutional environments (OECD, 2021). For the purpose of this study, firm size is proxied by total assets, total sales, and total equity, as these measures adequately capture the multidimensional nature of firm scale.

The Nigerian Real Sector

The real sector of the Nigerian economy comprises all activities involved in the production of tangible goods and services, including agriculture, manufacturing, construction, trade, and services. It represents the productive base of the economy and plays a central role in achieving macroeconomic objectives such as employment generation, income growth, and economic diversification (Central Bank of Nigeria, 2024). The performance of the real sector is often used as an indicator of overall economic productivity and development. As noted by Adenusi and Aluko (2015), the output level of the real sector reflects the efficiency with which resources are utilized in the economy. Recent reports further highlight that productivity in the real sector depends significantly on factors such as infrastructure, access to finance, technological adoption, and policy stability (World Bank, 2023). The sector is broadly classified into agriculture, industry, construction, wholesale and retail trade, and services (Central Bank of Nigeria, 2024). Its importance lies in several areas. First, it directly contributes to improving the standard of living by producing goods and services required to meet aggregate demand. Second, it serves as a transmission channel through which macroeconomic policies affect economic outcomes. Third, it reduces pressure on the external sector by fostering domestic production and creating backward and forward linkages within the economy (Anyanwu, 2010; National Bureau of Statistics Nigeria, 2024).

Firm Performance

Firm performance remains a central concern for academics, managers, and policymakers, as it reflects the efficiency and effectiveness of resource utilization within an organization. Firm size has been identified as one of the key determinants of performance across various empirical studies (Oyelade, 2019; Khemiri & Noubbigh, 2019; World Bank, 2022). The relationship between firm size and performance is often explained through economies of scale, market power, and diversification benefits. Larger firms tend to benefit from cost efficiencies, broader market access, and the ability to diversify risks across multiple business segments (Majumdar, 1997; Liu, 2018). Additionally, large firms often possess stronger administrative structures and better access to financing, which enhance their operational performance. However, the relationship is not always linear. While large firms enjoy advantages such as economies of scale and market dominance, they may also face challenges such as bureaucratic inefficiencies and agency problems. Furthermore, firm size is closely linked to market power, which enables firms to influence prices and improve profitability (Voulgaris & Lemonakis, 2014). Recent empirical literature suggests that the effect of firm size on performance may depend on contextual factors such as industry structure, institutional quality, and macroeconomic conditions, particularly in emerging economies like Nigeria (IMF, 2023; African Development Bank, 2024).

2.2 Theoretical Framework — Managerial Theory of the Firm

Numerous theories have been advanced within this field; however, this study is anchored on the managerial theory of the firm. This theory emphasizes the complexity of modern organizations and the evolving role of management. Robin Marris propounded the Managerial Theory of the Firm in 1964, centered specifically on the growth maximization model. The theory revolves around the assertion that managers are often motivated to maximize sales revenue rather than profits, as revenue growth is closely associated with managerial utility, job security, and organizational expansion. Managerial theory, therefore, conceptualizes managers as agents primarily driven by revenue maximization. It suggests that firms should focus on increasing output levels and expanding market share, which ultimately leads to higher sales volumes. Nevertheless, critics argue that the primary responsibility of managers should remain cost minimization and profit maximization. Others contend that managerial theory is merely an extension or refinement of the neoclassical theory of the firm. This study adopts the managerial theory to underscore the premise that firm size is largely driven by sales volume. Sales performance has a direct and significant influence on key components of firm size, including total assets and total equity, which are fundamental indicators of the scale of a corporate entity.

2.3 Empirical Review

Ebomuche et al. (2023) reviewed real sector performance as a driver of economic restructuring in Nigeria. Time-series data spanning 1981 to 2018, derived from the CBN Statistical Bulletin and the World Development Indicators (WDI), was used to conduct the study. Key variables included the growth rates of real GDP, services output, manufacturing output, industrial output, agricultural output, trade openness, and the real interest rate. The bounds-testing method of cointegration used was the Autoregressive Distributed Lag (ARDL) approach. The findings revealed a long-run equilibrium among the variables, and the error-correction mechanism was found to be significant, implying that short-run disequilibria were fully corrected within a span of one year. The results confirm that the real sector is the main driver of the Nigerian economy, exerting a positive and substantial influence on economic growth in both the short and long run. Contrary to previous hypothetical assumptions about a linear pattern of structural transformation, the study suggests an all-encompassing policy strategy in accordance with sector-specific dynamics.

Egbuhuzor and Wokeh (2022) adopted an ex-post facto research design to investigate how firm size influences the financial performance of listed deposit money banks in Nigeria. The research took into account all thirteen (13) banks listed on the Nigerian Stock Exchange, using a census sampling method. Data analysis was carried out through multiple regression with the aid of STATA 12. The results indicated that firm size, in terms of total assets and total revenue, does not have a statistically significant influence on the financial performance of the sampled banks.

Similarly, the effect of firm size on the performance of Vietnamese private enterprises was examined by Cuong et al. (2021), based on the results of the Annual Enterprise Survey (2009–2018). Using an Ordinary Least Squares (OLS) regression model, the analysis assessed the effects of firm size indicators (both static and dynamic), namely growth rate, total assets, and labor. The findings revealed that total assets are the strongest determinant of firm performance, followed by labor and growth rate. Structural issues were also noted, whereby as the number of enterprises grows, the share of small and micro firms increases while the shares of medium and large firms decrease.

In the study by Olawale et al. (2017), the authors examined how firm size and performance interact in 12 non-financial companies in Nigeria between 2005 and 2013. The study implemented pooled regression, fixed-effects, and random-effects models to evaluate firm performance in terms of return on equity (ROE), with firm size determined by total assets and total sales. The results showed a negative impact of total assets on performance, while total sales had a positive impact. Additionally, the control variables leverage and working capital were found to be positively related to firm performance.

Kumar and Kaur (2016) investigated the connection between firm size and profitability in the Indian automobile industry during the 1998–2014 period. The study used time-series and cross-sectional regression analysis; the results were mixed. The time-series analysis showed a positive relationship, whereas the cross-sectional analysis showed no significant correlation between firm size and profitability.

Kartikasari and Merianti (2016) examined how leverage and firm size impact the profitability of 100 manufacturing companies listed on the Indonesia Stock Exchange between 2009 and 2014. The study measured firm size by total assets and total sales, leverage by the debt-to-equity ratio, and profitability by ROA, using panel data regression with a fixed-effects model. The findings indicated that leverage positively and significantly influences profitability, total assets negatively and significantly impact profitability, whereas total sales do not significantly affect profitability.

Dahmash (2015) investigated the connection between firm size and profitability based on 1,538 publicly traded firms listed on the Amman Stock Exchange in Jordan between 2005 and 2011. The analysis, using pooled panel data, was conducted on the overall sample and sub-sectoral samples. The results showed that firm size and profitability had a strong positive correlation in key sectors. It was, however, discovered that total assets did not have a significant impact in certain industries, including banking, diversified financial services, and real estate.

Lastly, Danaei and Abdi (2015) examined the connection between firm growth metrics and capital structure sustainability among 101 listed companies on the Tehran Stock Exchange between 2006 and 2011. The research established a substantial negative correlation between the alteration in debt ratio and profitability. Moreover, firm size was found to have a positive relationship with alterations in debt ratio; in contrast, total equity showed a positive and significant effect on ROA. The paper concludes that firm size has a dual but important influence on firm performance, suggesting that greater use of assets, more effective revenue-generation methods, and effective equity management should be used as instruments for enhancing firm performance.

2.4 Gap in Literature

The review of empirical literature on firm size shows a paucity of empirical evidence; scholars' interest in firm size is quite scanty, and few of these studies have been carried out in Nigeria. There has been wide consideration of total assets and total sales as key explanatory variables for firm size (Egbuhuzor & Wokeh, 2022; Merianti, 2016; Cuong et al., 2021; Dahmash, 2015; Kartikasari & Merianti, 2016). However, the introduction of total equity as a predictor of firm size makes this study unique, as it provides empirical proof of an additional explanatory variable of firm size in examining its effect on the performance of real sector firms in Nigeria.

Furthermore, this study considers return on assets (ROA) as a real sector performance indicator, with a view to making a paradigm shift from the generally recognized macroeconomic real sector performance indicators, such as GDP growth, industrial output, and employment levels, as reflected in the work of Ebomuche et al. (2023). The study considers ROA in order to reflect the efficiency and profitability of real sector firms in utilizing productive assets.

3. METHODOLOGY

The research design of this study is ex-post facto, as the data used are historical in nature. The empirical research relies on panel data from a cross-sectional sample of four (4) selected quoted real sector firms in Nigeria over a period of fifteen (15) years, from 2011 to 2025. The research question under investigation is how firm size — measured by total assets (TA), total sales (TS), and total equity (TE) — influences real sector performance, measured by return on assets (ROA). The companies used in the research are Nigerian Breweries Plc, Dangote Sugar Plc, May & Baker Nigeria Plc, and Cutix Plc. These companies were selected purposively based on their liquidity positions and asset base, as reflected in the Equity Research Report (2022). Secondary data were obtained through the audited annual reports and accounts of the selected firms. Both descriptive and inferential analyses were conducted on the data. The hypotheses of the study were tested using panel regression analysis with the support of EViews version 10. The interpretation of the regression results was based on the size of the estimated coefficients, the level of statistical significance, and the performance of the stochastic error term.

3.1 Model Specification

The functional correlation between the dependent and independent variables in this study is expressed as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon$$

where Y is the dependent variable; X_1 – X_n are the independent/explanatory variables; ε is the stochastic error term; i is the i th observation; β_0 is the constant; β_1 – β_n are the regression coefficients for the independent variables.

Adopting the Ordinary Least Squares (OLS) framework above, this study adapts the model used by Olawale, Ilo, and Lawal (2017) in Nigeria, originally stated as:

$$ROE_{it} = \beta_0 + S_TA_{it} + S_TS_{it} + LEV_{it} + \varepsilon_{it}$$

where ROE = Return on Equity; S_{TA} = size in terms of total assets; S_{TS} = size in terms of total sales; LEV = Leverage; ε = stochastic error term; β_0 = constant; β_1 – β_n = regression coefficients for the independent variables.

The model was modified to suit the purpose of this study. The model below estimates the functional correlation between the dependent and independent variables in this study:

$$\text{Real sector performance} = f(\text{firm size}) \dots\dots\dots (1)$$

$$ROA = \beta_0 + \beta_1TA + \beta_2TS + \beta_3TE + \varepsilon \dots\dots\dots (2)$$

Translog form of the model:

$$ROA = \beta_0 + \beta_1\text{Log}TA + \beta_2\text{Log}TS + \beta_3\text{Log}TE + \varepsilon \dots\dots\dots (3)$$

Where: real sector performance is proxied by ROA (dependent variable); firm size is surrogated by TA, TS, and TE (independent variables); ROA = returns on assets, obtained as the ratio of profit after tax to total assets of the firm; TA = Total Assets; TS = Total Sales; TE = Total Equity; β_0 is the intercept of the population regression line; ε is the error term; Log is the natural logarithm.

3.2 Description and Operationalization of Variables

TABLE 1. Description and Operationalization of Variables

TYPE OF VARIABLE	PROXY	DESCRIPTION / OPERATIONALIZATION	SOURCE
Dependent variable	ROA	Ratio of profit after tax to total assets per annum	Selected firms' annual reports & accounts
Independent variables	LogTA	Log value of total assets per annum	Selected firms' annual reports & accounts
	LogTS	Log value of total sales per annum	Selected firms' annual reports & accounts
	LogTE	Log value of total equity per annum	Selected firms' annual reports & accounts

Source: Researchers' Innovation (2026)

A Priori Expectations

A priori, firm size is expected to have a positive and significant effect on the performance of quoted real sector firms in Nigeria. Firm size, measured by total assets, total sales, and total equity, is anticipated to enhance performance, proxied by return on assets (ROA). Specifically: total assets (TA) are expected to have a positive relationship with ROA ($\beta_1 > 0$), based on the assumption that firms with larger asset bases can generate more income through efficient asset utilization and economies of scale; total sales (TS) are expected to have a positive relationship with ROA ($\beta_2 > 0$), since higher sales indicate stronger market demand and revenue-generation capacity, which should translate into improved profitability; and total equity (TE) is expected to have a positive relationship with ROA ($\beta_3 > 0$), as firms with higher equity are financially stronger, less leveraged, and better positioned to invest in profitable ventures, thereby improving performance.

4. RESULTS AND ANALYSIS

4.1 Descriptive Statistics

TABLE 2. *Descriptive Statistics*

	ROA	TA	TS	TE
Mean	0.179764	0.831493	0.468768	0.297358
Median	0.135101	0.558440	0.306812	0.181016
Maximum	2.560508	8.365474	9.274105	3.189639
Minimum	-0.073800	0.304414	-0.886160	0.078328
Std. Dev.	0.328066	1.307825	1.195353	0.430082
Skewness	6.518601	5.104634	6.792602	5.555158
Kurtosis	47.84496	27.88357	50.78915	36.34505
Jarque-Bera	5452.599	1808.552	6170.902	3088.329
Probability	0.000000	0.000000	0.000000	0.000000
Sum	10.78582	49.88960	28.12609	17.84147
Sum Sq. Dev.	6.350012	100.9140	84.30326	10.91328
Observations	60	60	60	60

Source: Researchers' Review Output (2026)

Table 2 presents the descriptive statistics that summarize the behavior of the study variables: return on assets (ROA), total assets (TA), total sales (TS), and total equity (TE). The mean values for ROA, TA, TS, and TE are 0.179764, 0.831493, 0.468768, and 0.297358, respectively. Correspondingly, the median values are 0.135101 for ROA, 0.558440 for TA, 0.306812 for TS, and 0.181016 for TE. The maximum values recorded for the variables are 2.560508 (ROA), 8.365474 (TA), 9.274105 (TS), and 3.189639 (TE), while the minimum values are -0.073800 (ROA), 0.304414 (TA), -0.886160 (TS), and 0.078328 (TE). The standard deviations are 0.328066 for ROA, 1.307825 for TA, 1.195353 for TS, and 0.430082 for TE, indicating varying degrees of dispersion around their respective means.

The skewness coefficients for all variables are positive, indicating that the distributions are right-skewed. This suggests that the variables exhibit asymmetry, with a longer tail on the right-hand side. The kurtosis values for all variables exceed 3, indicating that the distributions are leptokurtic, characterized by a higher peak and heavier tails relative to the normal distribution. Furthermore, the Jarque-Bera statistics for all variables are statistically significant at the 5% level, implying that the null hypothesis of normality is rejected. This indicates that the variables are not normally distributed. However, this outcome is typical of financial panel data and does not compromise the validity of the regression estimates, particularly under panel EGLS estimation techniques.

4.2 Panel Unit Root Tests

TABLE 3. Result of Unit Root Tests (Augmented Dickey-Fuller)

VARIABLE	ADF P-VALUE @ LEVEL	ADF P-VALUE @ 1ST DIFF.	ORDER OF INTEGRATION	DECISION
ROA	0.0010	—	I(0)	Reject null hypothesis
TA	0.0002	—	I(0)	Reject null hypothesis
TS	0.2873	0.0103	I(1)	Reject null hypothesis (after 1st diff.)
TE	0.0003	—	I(0)	Reject null hypothesis

Source: Researchers' Review Output (2026)

From Table 3 above, it is evident that Return on Assets (ROA), total assets (TA), and total equity (TE) were stationary at level, I(0), stochastic process. This means that at the level order of integration, these data were stationary at level; as such, the null hypotheses at this order (at level) can be rejected.

Conversely, total sales (TS) became stationary after first differencing, indicating integration of order I(1) stochastic process. This means that at the level order of integration, the data were not stationary at level; as such, the null hypothesis at that level cannot be rejected. However, the variable became stationary after first differencing, indicating integration of order I(1), which informs that the null hypothesis is rejected at this order. In general, since it was differenced once to become stationary, it is said to be integrated of order one and is denoted by the I(1) stochastic process.

4.3 Panel Regression Result

TABLE 4. Panel Regression Result Showing the Effect of Firm Size on Return on Assets

Dependent Variable: ROA

Method: Panel EGLS (Period random effects)

Date: 03/29/26 Time: 02:09

Sample: 2011 2025

Periods included: 15

Cross-sections included: 4

Total panel (balanced) observations: 60

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TA	-0.053028	0.025250	-2.100069	0.0402
TS	0.014774	0.014652	1.008265	0.3177
TE	0.818388	0.076417	10.70955	0.0000
C	-0.026424	0.024829	-1.064234	0.2918
Effects Specification				
			S.D.	Rho
Period random			0.049155	0.1308
Idiosyncratic random			0.126712	0.8692
Weighted Statistics				
R-squared	0.836591	Mean dependent var		0.142029
Adjusted R-squared	0.827837	S.D. dependent var		0.312489
S.E. of regression	0.129659	Sum squared resid		0.941446
F-statistic	95.56635	Durbin-Watson stat		0.868334
Prob(F-statistic)	0.000000			

Source:

Unweighted Statistics			
R-squared	0.826792	Mean dependent var	0.179764
Sum squared resid	1.099876	Durbin-Watson stat	0.875469

Researchers' Review Output (2026)

TABLE 4B. Correlated Random Effects — Hausman Test (Test Period Random Effects)

TEST SUMMARY	CHI-SQ. STATISTIC	CHI-SQ. D.F.	PROB.
Period random	5.634995	3	0.1308

Source: Researchers' Review Output (2026)

The Panel Regression Result on Return on Assets and Firm Size, alongside the Hausman test in Table 4b above, suggests a preference for the random-effects estimation over fixed-effects, due to the insignificant p-value (0.1308) of the Chi-square statistic at the 5% level.

Hypothesis One

H₀: Firm size, measured by total assets, has no significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

H₁: Firm size, measured by total assets, has a significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

The panel least squares regression results presented in Table 4 indicate that total assets have a statistically significant effect on ROA, as evidenced by a p-value of 0.0402, which is less than the 0.05 significance level. Consequently, the null hypothesis is rejected, implying that firm size, proxied by total assets, significantly influences the return on assets of quoted real sector firms in Nigeria.

Hypothesis Two

H₀: Firm size, measured by total sales, has no significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

H₁: Firm size, measured by total sales, has a significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

The regression results (Table 4), based on the preferred random-effects model, reveal that total sales do not have a statistically significant effect on ROA. This is supported by a p-value of 0.3177, which exceeds the 0.05 threshold. Therefore, the null hypothesis is accepted, indicating that firm size, as measured by total sales, does not significantly affect the performance of quoted real sector firms in Nigeria.

Hypothesis Three

H₀: Firm size, measured by total equity, has no significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

H₁: Firm size, measured by total equity, has a significant effect on the return on assets (ROA) of quoted real sector firms in Nigeria.

The regression results further show that total equity has a positive and statistically significant effect on ROA, with a p-value of 0.0000, well below the 0.05 level of significance. Accordingly, the null hypothesis is rejected, confirming that firm size, proxied by total equity, significantly influences the performance of quoted real sector firms in Nigeria.

“

Total equity has the strongest effect on firm performance ($\beta = 0.818$, $p < .001$), while total assets show a significant negative effect ($p = 0.040$) and total sales show no significant effect ($p = 0.318$).

— KEY FINDING

Model Summary Statistics

The coefficient of determination (Adjusted R^2) reported in Table 4 is 0.836591, indicating that approximately 84% of the variation in return on assets is explained by the independent variables — total assets, total sales, and total equity. The remaining 16% is attributable to other factors not captured in the model. The Durbin-Watson statistic of 0.868334 suggests the presence of positive serial correlation in the residuals. However, the application of Panel EGLS with random effects helps to correct for such inefficiencies, thereby ensuring the robustness and reliability of the estimated parameters.

5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The study reveals the following key findings regarding the effect of firm size on real sector performance in Nigeria:

- a. Firm size, measured by total assets, has a negative but statistically significant effect on return on assets.
- b. Firm size, measured by total sales, exhibits a positive but statistically insignificant effect on return on assets.
- c. Firm size, measured by total equity, has a positive and statistically significant effect on return on assets.

5.2 Conclusion

This paper considered how firm size impacted the performance of quoted real sector firms in Nigeria, using total assets, total sales, and total equity as proxies for firm size, and return on assets (ROA) as the performance measure. The empirical evidence shows that total assets negatively impact ROA, with a t-statistic of -2.100069 and a p-value of 0.0402. This indicates that as total assets increase by 1%, ROA decreases by an average of 0.053028, implying that asset utilization may not be efficient. This result corresponds with that of Kartikasari and Merianti (2016) but differs from those of Egbuhuzor and Wokeh (2022) and Dahmash (2015).

Moreover, total sales were also observed to have a positive, insignificant impact on ROA (t-statistic = 1.008265; p-value = 0.3177). This means that the marginal change in ROA due to a 1% increase in total sales is 0.014774, though this effect is not statistically significant. This result aligns with Egbuhuzor and Wokeh (2022), but not with Olawale et al. (2017), who found the relationship to be significant. Lastly, total equity has a strong positive and statistically significant impact on ROA (t-statistic = 10.70955; p-value = 0.0000), with a 1% growth in total equity associated with growth of about 0.818388 in ROA. Generally, the paper concludes that firm size has a mixed but mostly significant impact on the performance of real sector firms listed in Nigeria.

5.3 Recommendations

- a. Effective asset management practices should be strengthened to ensure optimal utilization of assets and improved firm performance.
- b. Management should enhance revenue-generation strategies through efficient pricing policies and robust inventory control systems.
- c. Greater attention should be given to equity management, as it has a significant positive impact on firm performance.

DECLARATIONS

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