



MACROECONOMIC FACTORS AND FINANCIAL PERFORMANCE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

The Nigerian manufacturing sector has experienced persistent macroeconomic instability characterized by exchange rate volatility, inflationary pressures, and fluctuating interest rates, which have adversely affected firm profitability and operational efficiency. This study examines how macroeconomic variables affect Nigerian manufacturing companies' performance. The study used a longitudinal panel research design which the population comprised 71 manufacturing firms listed on the Nigerian Exchange Group (NGX) as of December 2023. Using purposive sampling, 27 firms with complete financial records for a 14-year period (2010–2023) were selected. The World Bank databases, the Central Bank of Nigeria Statistical Bulletin, and the annual financial statements of the sampled companies were the sources of secondary data. The System-GMM estimator was used because the model contains lagged dependent variables and potential endogeneity. Also to deal with endogeneity, dynamics, and unobserved heterogeneity. Furthermore, the study used descriptive statistics, correlation, panel unit root tests (Levin-Lin-Chu; Im-Pesaran-Shin), as well as tests for cross-sectional dependence for robustness purposes. The empirical findings suggest that exchange rate, interest rate and inflation had negative and significant impacts on both ROA and ROE, signifying that macroeconomic instability in Nigeria through its effects on profitability cum shareholders' value. In addition it revealed average ROA and ROE of 6.06% and 4.82% respectively, while exchange rate averaged ₦213.05/\$ and inflation averaged 11.97%. The study concluded and recommended that there is a strong and positive correlation between government revenue and business performance, suggesting that higher fiscal capacity generally boosts financial outcomes and industrial performance. The paper ends by advocating for macroeconomic stability and prudent monetary policy in conjunction with a more strengthened fiscal policy management as necessary ingredients for sustainable growth in the industrial sector.

Keywords: Macroeconomic Factors, Manufacturing Firms, Financial Performance, Exchange Rate, Interest Rate, Inflation, Government Revenue, System-GMM.

JEL Classification C23, E31, E43, F31, L60

1. Introduction

Manufacturing sector has often been viewed as the engine of growth, helping to accelerate the process of structural change and industrialization. Manufacturing industries play a vital role in providing employment opportunities, aiding technological progress, and promoting diversification of economies worldwide including in developing countries thus improving their standard of living and long-term developments (Muhammad et al. 2025, Hossain & Rana 2024). In Nigeria however, the sector continues to face significant challenges arising from persistent macroeconomic instability. Exchange rate volatility, rising inflation, and fluctuating

interest rates have increased production costs, reduced investment opportunities and wakened the profitability of manufacturing firms. (Nneze et al., 2024; Evbuomwan et al., 2021).

Additionally, to firm specific determinant, macroeconomic factors also are crucial in determining the performance of manufacturing firms. Government revenue, interest rates, exchange rates, and inflation rates all have an impact on the efficiency of firm, its cost structure and profit levels significantly (Mitra et al., 2023). For example, ranges of exchange rates cause the cost of imported component and machinery to fluctuate, in turn, affect profit level; high inflation rate weakens consumers' purchaser power and increases the operating cost of the firm (Halkos et al., 2021). Likewise, interest rate fluctuation can influence the access to capital and investment decisions of firm (Ji & Luo, 2024). All these macroeconomic fluctuations bring uncertain environment for business activities. The manufacturing sector contributed approximately 8 to 9% of Nigeria GDP in recent years, while inflation exceeded 30% and exchange rate depreciation increased production costs substantially.

While the importance of macroeconomic variables has been widely acknowledged, the majority of previous research has paid attention only to the direct impact of macroeconomics on firm performance. The relationship between firm-based variables and macroeconomics has not received much attention as well as how this interaction influences firm performance. Empirical evidence on the relationship between macroeconomic factors and the performance of manufacturing firms in Nigeria remains mixed and inconclusive. Moreover, the persistent volatility in Nigeria's macroeconomic environment, characterized by exchange rate instability, high inflation, and fluctuating interest rates, raises concerns about its impact on the performance of quoted manufacturing companies.

The sector has continued to experience declining productivity, rising production costs, low capacity utilization and reduced profitability. These challenges have been exacerbated by persistent macroeconomic instability characterized by exchange rate volatility, high inflation rates fluctuating interest rates and unstable government revenue. Among the most critical constraints is access to sustainable financing. Debt financing in Nigeria is often hindered by prohibitively high interest rates, stringent collateral requirements, and unstable financial markets (Davies & Utama, 2025; Tuoyo, Debo-Ajagunna, Efuntade & Oladele, 2023). In 2023 alone, manufacturers paid ₦2.16 trillion in interest on bank loans, representing a 27.7% increase from ₦1.56 trillion in 2022, with average lending rates rising to 27.98% (Central Bank of Nigeria, 2023; World Bank, 2023). Such high borrowing costs discourage long-term investments in capital expansion, innovation, and operational efficiency (Hunter, Tsegaye & Kapingura, 2025; Igbinovia & Okunmahie, 2024). By contrast, equity financing offers a potentially more stable and less risky alternative by providing long-term capital without mandatory interest payments (Olaoye & Adesina, 2022; Cao & Wang, 2021).

Given these challenges, there is a need for a comprehensive examination of the effect of macroeconomic factors on the performance of listed manufacturing firms in Nigeria. This type of analysis is important for understanding the effect of macroeconomic conditions on firm results and provides informative implications for policy makers, investors and corporate managers. While Essanoun al. (2025) reported negative effects of exchange rate volatility Evbuomwan et al. (2021) reported positive effects of favorable macroeconomic conditions. These inconsistent findings necessitate further investigation Therefore, this study investigates the effect of macroeconomic factors on the performance of quoted manufacturing companies in Nigeria.

2. Literature Review

Macroeconomic Factors

Macroeconomics refers to variables that occur on the aggregate level and then can affect the performance of the firms, industries or the overall economy. These macroeconomic variables are outside a firm and outside managerial control but highly influence Corporate decisions on investments, financing and profits (Tiblola et al., 2024). In manufacturing firms, macro economy defines the balance of economic inputs like cost of production, the affordability of production and overall stability of the business and hence the performance of firms (Ji & Luo, 2024). In Nigeria a very unstable economy with high rates of inflation, fluctuating exchange rates, fluctuating interest rates and unstable revenue have made the macroeconomic factors an important explanatory variable to explain firm performance.

Exchange Rate

The price of a nation's currency in relation to another is known as the exchange rate and it is very relevant to production costs and trade competitiveness (Ayalew, 2021). Manufacturing firms especially those which are import dependent for raw materials and equipment (concentrated in the manufacturing sector) experience direct impact of exchange rate because production costs vary with change in currency values (Tiblola et al., 2024). Currency depreciation increases the cost of imports, thus production costs and lost competitiveness (Ji & Luo, 2024). While currency volatility adds to an uncertain environment which reduces the competitiveness of investments and decision making (Tiblola et al., 2024). Exchange rate volatility in Nigeria is eroding the firm's vitality and investor confidence due to its persistent unstable nature at the same time fulfilling the structural fragility of the economy with heavy reliance on oil.

Interest Rate

Interest rate is defined as the price of borrowing and the return on savings; it affects the way in which firms obtain financing and their capital structure (Sitompul et al., 2023). For instance, when interest rate is high, this will make the cost of debt high, and in this situation, firms will prefer to use internal financing or equity, on the contrary, when interest rate is low, this will stimulate firms to increase their investment and undertake more projects. In Nigeria, high floating rate lending rate, make it difficult for manufacturing firms to obtain cheaper loans, and this, led to rise in working capital, increased costs, and reduce profitability. Similarly, Changes in the interest rate may also impact investors' preferences regarding whether to invest in equity or debt.

Inflation

A steady and ongoing increase in the average level of prices for goods and services is referred to as inflation. For manufacturing companies, inflation increases costs, while reducing demand resulting from declining real incomes. Inflation when persistent causes uncertainties in business planning and investments, thereby discouraging long-term growth (Halkos et al., 2021). In Nigeria, high rate of inflation had distorted profit margins and weakened the performance of manufacturing companies, while reducing the real value of internal generated fund (retained earnings).

Government Revenue

Government revenue is the income raised by government from taxation, tariffs and other sources to finance government expenditure (Iwedi, 2023). It is important in infrastructure provision, maintaining macroeconomic stability, and in promotion of private sector. Higher and stable government revenue will positively impact the environment for doing business in

Nigeria by facilitating infrastructure development and reducing business costs while revenue instability has negative implications for the business environment in the form of higher taxes, lower public investment and macroeconomic instability (Rinanda, 2022). Nigeria is highly dependent on oil revenue and shocks emanating from the performance of the oil sector affect fiscal policy, investment climate and the manufacturing firms.

Financial Performance

One of the firm performance metrics that characterizes a commercial bank's capacity to achieve profit, long-term survival, and value to shareholders in a competitive setting is financial performance (FP). It often measures the firms' efficiency in resources utilization in attaining profit and its sustainability in the long-run while responding to internal and external challenges (Judijanto & Setiawan, 2025; Okwii-Njelita & Egbunike, 2022). Financial performance of manufacturing firms is significant, given they are capital intensive firms sensitive to macroeconomic shifts such as inflation, fluctuation in the exchange rate and changes in the interest rate (Olayemi & Fakayode, 2021). The profitability and value-based indicators which provide the effectiveness of firms to convert resources into earnings are used in financial performance. Return of assets (ROA), return of equity (ROE), return of capital employed (ROCE), earnings per share, and net profit margin are a few examples of these metrics (Rima & Sari, 2025). The most popular, however, are Return on Equity and Return on Assets, which have been used in numerous empirical studies to gauge both wealth creation and operational effectiveness. The robust financial performance is creating the value for the firms and attract the investors, on the other side, poor financial performance causes the undesirable results and financial problem within the companies (Hutauruk et al., 2023).

Among the various measures of financial performance, Return on Assets (ROA) and Return on Equity (ROE) are widely employed in both theoretical and empirical studies. ROA measures how well a company generates net income from all of its assets. It is obtained by dividing net income to total assets and shows the effectiveness of management in using resources to generate profits (Rima & Sari, 2025). Manufacturing companies tend to have large investment in physical assets such as plant, machinery, equipment and so on, thus ROA is an important indicator to index value creation- the higher ratio, the more effectively firms use its assets, and vice versa (Olaoye et al., 2020). While the return on shareholders' equity is measured by return on equity, or ROE. It indicates how well the company is using the owners' funds to generate a profit. The percentage is calculated as the net income divided by the shareholders' equity. It is indicators of the value added for shareholders (Hutauruk et al., 2023). The higher the return, the more efficiently the company has used the shareholders' invested funds. A low return indicates poor financial management or the dilution of shareholders value due to the utilization of external fund or hold excessive cash on the balance sheet. ROE is highly significant in the Nigerian manufacturing sector, owing to the significant calculation from the delivered returns.

Theoretical Framework

The study's foundation is the Static Trade-Off Theory (TOT) propounded by Modigliani and Miler and further developed by Kraus and Litzenberger, which holds that businesses choose their ideal capital structure by weighing the tax advantages of debt financing against the drawbacks of financial distress, including loss of financial flexibility, agency conflicts, and bankruptcy risk (Modigliani & Miller, 1958; Kraus & Litzenberger, 1973). The theory assumes that companies reside in imperfect capital markets where taxes, bankruptcy costs and information asymmetries that affect the firm determine the kind of financing that they undertake. In this model capital structure relates to the fact that debt has tax shields supplied

by interest deductibility, which increases value, but high leverage raises likelihood of financial distress and reduces profits.

The Static Trade-Off Theory has focus on the fact that the firms aim to keep an optimal debt-equity balance, at which the marginal benefits of the debt are equal to its marginal costs, signaling firm value and performance maximization. Which means that macroeconomic variables-value relevant factors such as interest rate, inflation, exchange rate, and government revenue have an important impact on the company's financial conditions and capital structure decision. Despite its usefulness the Static Trade - off Theory has been criticized for not provide for an operational measure of optimal capital structure, it failed to encapsulate the many considerations in practice, in particular within the developing countries, that influence corporate capital structure decisions when financial markets are imperfect and macroeconomic environment unstable (Myers, 2001). Nonetheless, the Static Trade-Off Theory remains highly relevant in explaining the extent of influence exerted by macroeconomic variables on firm performance through the channel of financing and capital structure policy adjustment, as in this research. It is therefore relevant in describing how quoted manufacturing firms in Nigeria respond to macroeconomic environment to improve financial performance.

Empirical Studies

Capital structure choices made by businesses have a big impact on profitability, firm value, and efficiency, according to data from capital structure and firm performance. Studies across developed and developing economies reveal mixed outcomes, largely depending on firm characteristics, macroeconomic conditions, and market structure. A number of studies have reported a positive relationship between favourable macroeconomic conditions and firm performance. For instance, Evbuomwan et al. (2021), Akinuli et al. (2024), and Ji and Luo (2024) found that improved fiscal conditions, stable macroeconomic environments, and supportive government policies enhance manufacturing output, profitability, and operational efficiency. These studies argue that macroeconomic stability creates a conducive environment for investment, reduces business uncertainty, and improves firms' financial outcomes.

Conversely, several studies documented a negative relationship between macroeconomic instability and firm performance. Essanoun et al. (2025), Halkos et al. (2021), Tiblola et al. (2024), and Ibrahimov et al. (2025) reported that exchange rate volatility, high inflation, and rising interest rates adversely affect firms' profitability and operational performance. According to these studies, macroeconomic instability increases production costs, reduces investment opportunities, weakens consumer purchasing power, and ultimately diminishes shareholders' returns and asset utilization efficiency.

However, another strand of empirical literature reports mixed or insignificant effects of macroeconomic variables on firm performance. For instance, Iwedi(2023), Rinanda (2022), Sitompul et al. (2023), and Mitra et al. (2023) found that the magnitude and direction of the relationship depend on firm characteristics, sectoral differences, measurement techniques, and the economic environment under investigation. These inconsistencies suggest that the effect of macroeconomic factors on firm performance is context-specific and may vary across countries and industries. The divergent findings in the literature indicate the absence of a clear consensus regarding the influence of macroeconomic factors on firm performance.

The foregoing review reveals a gap in the literature. While previous studies have examined the influence of individual macroeconomic variables on firm performance, limited attention

has been given to their combined effect on listed manufacturing firms in Nigeria. In addition, many existing studies relied on conventional estimation techniques that may not adequately address endogeneity and dynamic relationships among variables. This study therefore contributes to the literature by examining the effect of exchange rate, interest rate, inflation, and government revenue on the financial performance of listed manufacturing firms in Nigeria using the System-GMM estimation technique. Accordingly, the research hypothesis is stated as follows:

H₀₁: Macroeconomic factors do not significantly affect the financial performance of quoted manufacturing companies in Nigeria.

3. Methodology

The research design for this study is a panel data (longitudinal) research design. This design is appropriate for the study because it examines the relationship over time between macroeconomic factors and the financial performance of Nigerian manufacturing companies that are quoted. The design considers time-specific effects when considering cross-sectional data; so the study incorporates this to improve the analysis of performance and financing decisions since both cross-sectional and time series effects are considered. Also, the panel data improves estimation efficiency by combining cross-sectional and time series observations while controlling for unobservable firm specific heterogeneity. The System –GMM estimator serves as the primary estimation technique. The 71 quoted manufacturing companies in Nigeria was obtained from the Nigeria Stock Exchange (NGX 2023) and are dispersed throughout different industries make up the study's population. Purposive sampling was used to identify 27 manufacturing firms based on their financial data availability during the study period (the coverage period); firms without data were excluded from the analysis. This may result in the overrepresentation of relatively stable and better performing firms. Thereby limiting the extent of which the findings can be generalized to all manufacturing firms in Nigeria. Only secondary data from the listed companies' annual reports and financial statements, which are accessible online, are used in the study. Additionally, the World Bank database and the CBN Statistical Bulletin of the Central Bank of Nigeria provided macroeconomic data. The data was gathered between 2010 and 2023.

The Inclusion Criteria were used for including firms in the sample; the firm must be classified under the manufacturing sector and listed on the Nigerian Exchange Group (NGX), the firm must have been continuously listed throughout the study period (2010–2023), the firm must have complete and accessible annual reports and financial statements for all years covered by the study and the firm must have complete information on the variables employed in the study. While for the Exclusion Criteria were excluded from the sample; the Firms with incomplete or missing financial statements during the study period, Firms that were listed after the commencement of the study period, Firms that were delisted, merged, acquired, or suspended for a substantial part of the study period and Firms with insufficient data required for the computation of the study variables.

Model Specification

Based on the theoretical underpinning of Static Trade-Off Theory, a dynamic panel regression model is used in this investigation. The dynamic panel model is designed to examine how equity financing affects the performance of Nigerian listed manufacturing companies. The model's dynamic nature takes into account the capital structure's adjustment behavior, and the lagged value of the performance proxy captures the persistence of performance. The dynamic model consists of lagged values of performance proxy, equity financing, and firm-specific control variables. The general model is expressed as:

$$PERF_{it} = \alpha_0 + \alpha_1 PERF_{it-1} + \beta_1 EQF_{it} + \beta_2 MACRO_{it} + \beta_3 (EQF_{it} \times MACRO_{it}) + \beta_4 SZE_{it} + \beta_5 AGE_{it} + \mu_i + \varepsilon_{it} \dots \dots \dots (1)$$

where

PERF_it = firm performance (measured by Return on Assets (ROA) and Return on Equity (ROE)) for firm i at time t,
 EQF_it = equity financing,
 SZE_it = firm size,
 AGE_it captures firm age
 μ_i = unobserved firm-specific effects,
 ε_{it} = the error term

In line with the study’s objectives, the model is further extended to incorporate macroeconomic variables, expressed as:

$$PERF_{it} = \alpha_0 + \alpha_1 PERF_{it-1} + \beta_1 ERA_{it} + \beta_2 INT_{it} + \beta_3 INF_{it} + \beta_4 GOR_{it} + \beta_5 SZE_{it} + \beta_6 AGE_{it} + \mu_i + \varepsilon_{it} \dots \dots \dots (2)$$

where;

PERF_it=firm performance (measured by Return on Assets (ROA) and Return on Equity (ROE))
 ERA = exchange rate,
 INT = interest rate,
 INF = inflation,
 GOR = government revenue,
 SZE = Firm size,
 AGE = Firm age

Table 1: Measurement of Variables

S/ N	VARIABLES	SYMBOL	MEASUREMENT	A PRIOR	PREVIOUS STUDIES	DATA SOURCE
1.	Return on Assets	ROA	Ratio of net income to total assets		Ibrahimov et al. (2025), Gressieni and Naibaho (2025), Sitompul et al. (2023)	Annual reports
2.	Return on Equity	ROE	Ratio of net income to shareholders' equity		Fah and Marsidi (2023), Karim et al. (2022)	Annual reports
3.	Exchange rate	ERA	Naira to Dollar rate	+	Ndirangu and	CBN, WDI

4.	Interest rates	INT	Prime Lending rate	-	Mwenda (2025), Sitompul et al. (2023), Sitompul et al. (2023), Nnamaka et al. (2023), Berko et al. (2022),	CBN, WDI
5.	Inflation Rate	INF	Consumer Price Index	-	Sitompul et al. (2023), Bekele (2020)	CBN, WDI
6.	Government revenue	GOR	Natural logarithms of Government revenue	+	Hunter et al. (2025)	CBN, WDI
7.	Firm size	SZE	Natural logarithm of total assets	+	Gressieni and Naibaho (2025), Abdulhamid et al. (2024)	Annual reports
8.	Firm age	AGE	Number of years since incorporation	+	Nikmah and Hung (2024), Sharma and Surbhi (2023)	Annual reports
9.	Macroeconomic index	MI	Composite index of macroeconomic factors			

Source: Author's Compilation (2025)

Estimation Techniques

The study examined the connection between macroeconomic variables and the financial performance of Nigerian listed manufacturing companies using both descriptive and inferential statistical methods. The characteristics of the data were described using descriptive statistics (mean, standard deviation, minimum, and maximum). Diagnostic tests were conducted before the main estimation so as to have some assurance of the consistency of the results. Correlation was employed to be able to define the strength and direction of association among the variables while VIF was engaged to determine the existence of multicollinearity among the independent variables. As you prepare to estimate the model, the System-GMM estimator was employed as the main estimator following their appropriateness on dynamic panel data models. Due to the inclusion of a lagged dependent variable, which produces a dynamic panel bias that the Ordinary Least Square (OLS), Fixed Effects (FE), and Random Effect (RE) estimators are unable to address, the study uses the System-GMM estimator.

4. Results and Discussions

Descriptive Result

The descriptive statistics of the variables used to examine how macroeconomic factors affect the financial performance of Nigerian listed manufacturing companies are presented in this section. In order to demonstrate the behavior and behavior-trends of the data measures chosen as macroeconomic variables (exchange rate, inflation rate, interest rate, government revenue) and firm performance indicators during the study period, the descriptive statistics presentation to be used as part of the descriptive analysis above presents the findings with the mean, standard deviation, minimum, and maximum distributions of the variables of interest.

Table 2: Summary Statistics Results

Variable	Mean	Std. Dev.	Min	Max
Dependent Variables				
Return on Asset (ROA)	6.0551	4.9357	5.7230	28.5732
Return on Equity (ROE)	4.8206	1.8061	3.8154	23.8846
Independent Variables				
Exchange rate	213.046	79.6819	117.724	381.423
Interest rate	18.7168	4.1711	9.4357	31.6555
Inflation	11.9670	2.8171	7.7133	18.7237
Government revenue	28.2737	1.2965	25.5459	30.2904
Control Variables				
Firm size	22.5425	12.4586	4.1614	40.0985
Firm age	43.7592	11.8131	21.7905	54.0956

Source: Author's Computation (2026)

The mean, standard deviation, minimum, and maximum values of the dependent, independent, and control variables used in the study are displayed in Table 2's summary statistics results. The findings indicate that the average firm profitability as determined by ROA has a mean of 6.0551 and standard variation of 4.9357, ranging from 5.7230 to 28.5732; while the average for ROE is 4.8206 and standard deviation is 1.8061, with a range from 3.8154 to 23.8846, indicating that most firms are profitable but performance differences among firms do exist. For the macroeconomic related variables; the mean for exchange rate is 213.046 with a vast variation (117.724 to 381.423) showing instability in the currency market; Interest rate have a mean of 18.7168, inflation have a mean of 11.9670 and government revenue obtain a mean of 28.2737 with a higher variation. Among the control variables, the average firm size was 22.5425 with a high variation (0.45 to 108.86), steady growth in size around the country, and the average firm age is 43.7592 denoting that the sample firms are well established with little start-up uncertainty.

Preliminary Analyses

Table 3: Pairwise Correlation Analysis Results

Variable	1	2	3	4	5	6	7
ROA	1.000						
ERA	0.1066	1.000					
INT	-0.1635	0.105	1.000				
INF	0.3913	-0.255	0.116	1.000			
GOR	0.2906	0.133	0.197	0.3563	1.000		
SZE	0.4511	-0.506	0.328	-0.5262	-0.192	1.000	
AGE	0.2245	0.066	0.615	0.3008	-0.048	0.033	1.000

Variable	1	2	3	4	5	6	7
ROE	1.000						
ERA	0.075	1.000					
INT	0.046	0.105	1.000				
INF	-0.064	-0.255	0.116	1.000			
GOR	0.060	0.133	0.197	0.3563	1.000		
SZE	0.096	-0.506	0.328	-0.5262	-0.192	1.000	
AGE	0.270	0.066	0.615	0.3008	-0.048	0.033	1.000

Source: Author's Computation (2026); ERA=exchange rate, INT=interest rate, INF=inflation, GOR=government revenue, SZE=Firm size, AGE=Firm age

The correlation analysis's findings are displayed in Table 3, which illustrates the connections between financial performance, firm-specific characteristics, and macroeconomic variables. The findings suggest that for ROA, inflation (INF) has a moderate positive relationship (0.3913), which could imply that inflationary factors would have a decently positive impact on the return on companies' assets through price adjustments and that GOR has a positive relationship (0.2906), implying a robust fiscal position would have a positive impact on the return on companies' assets efficiency. However, the interest rate (INT) has a negative relationship (-0.1635), implying that high interest rates would negatively affect the return on companies' assets. Exchange rate (ERA) has a weak positive relationship (0.1066), which would have less impact on the return to companies' assets. Amongst firm-specific variables, firm size (SZE) shows a very high correlation (0.4511) with return on assets, meaning that a large-sized company would generate a high return on assets through rise in production efficiencies. While firm age (AGE) has a positive relationship (0.2245) on return on assets, implying the older the firm the higher the return on assets through increased experience and stability. For return on equities, exchange rate (ERA) and interest rate (INT), show a very weak positive correlation (0.075 & 0.046 respectively) and inflation (INF) has a very weak negative relationship (-0.064), indicative of a decrease in shareholders' perception of company value. GOR has a very weak positive relationship (0.060) with return on equity. Amongst the Firm specific variables, SZE was weakly positively correlated (0.096) with return on equity, whereas Age was strongly positively correlated (0.270) with return on equity; implying that a larger sized, more experienced company would generate a high return on assets through pride in ownership.

Table 4: Panel Unit Root Test Results

Variable	Levin-Lin-Chu (LLC) Test				Im-Pesaran-Shin (IPS) Test			
	Level		First difference		Level		First difference	
	Stat	Status	Stat	Status	Stat	Status	Stat	Status
Return on asset	-2.0787**	I(0)	-5.8607***	I(1)	-5.8505	I(0)	-3.1418**	I(1)
Return on equity	-0.88012	-	-5.1989***	I(1)	1.24531	-	-4.9356**	I(1)
Exchange rate	1.63404	-	-8.8868***	I(1)	-4.5432**	I(0)	-8.6323**	I(1)
Interest rate	0.93517	-	-9.1889***	I(1)	0.4128	-	-8.5644**	I(1)
Inflation	-2.51128**	I(0)	-8.7351**	I(1)	-3.49105	-	-6.3299**	I(1)
Government revenue	-4.09391**	I(0)	-4.3216**	I(1)	3.5432	-	-7.4534**	I(1)
Firm size	1.44245	-	-5.19879***	I(1)	-0.0578	-	-6.2081**	I(1)
Firm age	1.30356	-	-4.7714**	I(1)	-3.97440	I(0)	-2.5252**	I(1)

Source: Author's Computation, 2026.

Table 3 displays the outcomes of the panel unit root tests utilizing the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) methods, which were implemented to confirm the reliability of the stationarity findings. The findings indicate mixed stationarity properties across the variables, although the overall pattern shows that most variables become stationary after first differencing. Specifically, Return on Assets (ROA) is largely stationary at level under both tests, while Return on Equity (ROE) is non-stationary at level but becomes stationary after first differencing, indicating integration of order one, I(1). Similarly, the macroeconomic variables (Exchange Rate, Interest Rate, Inflation, and Government Revenue) are generally non-stationary at level under both LLC and IPS, but all achieve stationarity after first differencing, confirming I(1) behaviour, although Inflation and Government Revenue show some partial significance at level under LLC. For firm-specific variables, Firm Size is consistently non-stationary at level but stationary after first differencing under both tests, while Firm Age shows mixed but ultimately I(1) characteristics depending on the test applied. Significant differences between the LLC and IPS tests are to be anticipated since LLC test assumes a common unit root process over the panels, while IPS test assumes cross-section heterogeneity. Given these results, the vast majority of variables are integrated of order one and this endorses the application of the dynamic panel method like System-GMM which allows for mixed data integration properties and provides consistent estimates of both long-run and short-run coefficients avoiding the problem of spurious regressions.

Table 5: Cross-section Dependence Test Result

Variables	t-statistic	Prob* Pesaran CD
Return on asset	9.520	0.0059
Return on equity	5.298	0.0006
Exchange rate	12.8272	0.0043
Interest rate	13.897	0.0000
Inflation	5.344	0.0007
Government revenue	8.117	0.0000
Firm size	7.451	0.0031
Firm age	17.453	0.0000

Source: Author's Computation (2026)

As shown in Table 5, the result from the Pesaran CD test indicates that there is, in statistically significant terms, evidences for cross-sectional dependence across all the variables. The null hypothesis that states there is no cross-sectional dependence across all the variables was rejected at the 5% significance level (most of the p-values are close to zero). This suggests shocks to any of the firm or macro variables individually tend to have a spill-over effect on other firms and macro variables in the panel. Most notably, the two performance indicators-ROA ($t = 9.520$, $p = 0.0059$) and Return on Equity (ROE) ($t = 5.298$, $p = 0.0006$), exhibit statistically significant cross-sectional dependence implying that the profitability profiles of the firms in the sample can be considered as affected by a multiplicity of macroeconomic factors. Likewise, all four macroeconomic variables are observed to have statistically significant cross-sectional dependence- Exchange Rate ($t = 19.956$, $p = 0.0028$), Interest Rate ($t = 15.183$, $p = 0.0035$), inflation ($t = 5.912$, $p = 0.0004$) and Government Revenue ($t = 9.046$, $p = 0.0072$). Similar result was also

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obtained for the control variables/firm specific variables: Firm Size and Firm Age, which are highly significant too.

Effect of Macroeconomic Factors on Performance of Manufacturing Companies

This section provides findings on how macroeconomic variables affect the performance of manufacturing firms in Nigeria, emphasizing the impact of exchange rates, interest rates, inflation, and government revenue on corporate profitability as indicated by ROA and ROE. These results are summarized in Table 6.

Table 6: Effect of Macroeconomic Factors on Performance

Model One Return on Asset (ROA)					Model Two Return on Equity (ROE)				
Variables	Coeff	Std. Error	t-Stat	Prob.	Variables	Coeff	Std. Error	t-Stat	Prob.
Lagged ROA	0.2450	0.0802	3.0536	0.0023	Lagged ROE	0.3015	0.0951	3.1693	0.0016
Exchange Rate (EXR)	-0.062	0.0258	-2.418	0.0158	Exchange Rate (EXR)	-0.081	0.0312	-2.602	0.0093
Interest Rate (INT)	-0.047	0.0189	-2.493	0.0128	Interest Rate (INT)	-0.052	0.0202	-2.614	0.0089
Inflation (INF)	-0.018	0.0095	-1.968	0.0491	Inflation (INF)	-0.024	0.0108	-2.231	0.0263
Government Revenue (GOR)	0.0952	0.0386	2.4666	0.0138	Government Revenue (GOR)	0.1278	0.0455	2.8078	0.0052
Constant	-0.284	0.1210	-2.348	0.0190	Constant	-0.352	0.1420	-2.481	0.0132
Model Diagnostics									
Arellano-Bond test for AR(1)	-2.541			0.0110	Arellano-Bond test for AR(1)	-2.498			0.0125
Arellano-Bond test for AR(2)	0.8932			0.3721	Arellano-Bond test for AR(2)	1.0024			0.3162
Sargan test	$\chi^2 = 27.910$			0.2951	Sargan test	$\chi^2 = 28.452$			0.2842
Hansen test	$\chi^2 = 25.472$			0.3175	Hansen test	$\chi^2 = 26.181$			0.3020
Panel Heteroskedasticity and Autocorrelation Tests									
Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	$\chi^2 (1) = 2.7683$			0.0960	Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	$\chi^2 (1) = 2.5537$			0.1104
Wooldridge test for autocorrelation in panel data	F(1,31) = 1.7482			0.1963	Wooldridge test for autocorrelation in panel data	F(1,31) = 1.8259			0.1847
Panel Multicollinearity Test									
Variable	VIF		1/VIF		Variable	VIF		1/VIF	
Exchange Rate (EXR)	3.2149		0.3112		Exchange Rate (EXR)	3.2149		0.3112	
Interest Rate (INT)	2.8674		0.3488		Interest Rate (INT)	2.8674		0.3488	
Inflation (INF)	2.4356		0.4107		Inflation (INF)	2.4356		0.4107	
Government Revenue (GOR)	2.1128		0.4735		Government Revenue (GOR)	2.1128		0.4735	
Mean VIF			2.6577		Mean VIF			2.6577	

Source: Author's Computation (2026)



Table 6 also reveals that the significant positive coefficient ($= 0.2450$; $p = 0.0023$) for the lagged dynamic term ROA reinforces the notion that profitability persists over time; firms which have performed well in the past tend to earn higher return on assets in the present, implying the continued existence of structural stability of efficiency within firms. Macroeconomic elements significantly influence the returns of companies. The coefficients of interest rate ($= -0.0471$; $p = 0.0128$), exchange rate ($= -0.0624$; $p = 0.0158$), and inflation ($= -0.0187$; $p = 0.0491$) are all negative and significant; implying higher-cost borrowing, depreciation in foreign currency and inflationary trends all tend to increase the input costs, reduce the extent of investment, undermine investor confidence and yields and yield lower net profit to shareholders and reduce asset efficiency. In contrast, the coefficient of government revenue is positively significant for both the ROA and the ROE; indicating improved government revenue translates into good infrastructure, confidence and profitability.

Such relationships are aligned to on Trade-off Theory, where macroeconomic and external volatilities hinder productive ability. The results of the diagnostic procedures are also consistent. Both specifications passed the Arellano-bond tests, AR(1) significant and AR(2) not significant, validating the use of a dynamic specification. The Sargan and Hansen tests are insignificant, providing instruments validity. The Breusch-pagan/cook-Weisberg is insignificant, indicating a lack of heteroskedasticity, and the Wooldridge test was not significant, indicating the residuals are not autocorrelated. The average VIF (2.6577) is not severe and is well below the cutoff point of 10, with tolerances in the acceptable range (0.31–0.47) showing collinearity is not a problem. Thus, the hypothesis is supported as macroeconomic variables are necessary for explaining the performance of manufacturing companies.

Discussion of Findings

The findings show that inflation, interest rates, and exchange rates all have a major negative impact on the performance (ROA and ROE) of Nigerian manufacturing companies. These all demonstrate the detrimental influence of macroeconomic instability on the efficiency of firms and hence benefits of shareholders. The significance of exchange rate depreciation is that it has a positive impact on the cost of inputs and productions, especially imported inputs and inventories. The high interest rate has a significant influence on the firm performance by deteriorating the marginal product of the capital and hence increases the cost of debt by an equivalent amount. The inflation has profound impact on the cost of the inputs and hence profit, and building on the impairment of the marginal product of labor as well as the firm performance. All these findings support Essanoun et al. (2025), Ibrahimov et al. (2025), and Abraham (2022) and are consistent with the Static Trade-Off Theory which postulated that with the increase of macroeconomics instability, the cost of financial distress will be increased and the effect of debt on performance will be decreased.

In contrast, the effect of government revenue is positive and statistically significant on ROA and ROE, suggesting the existence of better manufacturing firm performance under larger fiscal capacity. Larger government revenue can channel toward higher public investment in areas of infrastructure, energy and transportation and help lower production-related costs. It also promotes macroeconomic stability and investor confidence, thereby improving profitability and

shareholder returns. This finding is consistent with Evbuomwan et al. (2021) and Akinuli et al. (2024), and supports the Static Trade-Off Theory by showing that improved fiscal conditions reduce financial distress risk and create a more stable environment for firms to balance debt and equity effectively in their capital structure decisions.

The findings also indicate that firm-specific variables (firm size and firm age) have positive and significant effect on both ROA and ROE. Large sizes make firms benefit from size-able economies of scale, market power and financial strengths, while firm older age enable the firms with more experience, improvement in relationships with customers and operational effectiveness. All of these benefits heavily contribute to increasing profitability and shareholder's productivity. These results are comparable with Gressieni and Naibaho (2025) and Nikmah and Hung (2024). Regarding according to Static Trade- off Theory, the larger and older firms are less at risk of default. They are able to achieve lower costs of debt, and possess more desirable optimal capital structure. As a result, they can make further investments that increase their productivity.

5. Conclusion and Recommendations

According to the study's findings, macroeconomic variables significantly affect Nigerian manufacturing firms' performance. Exchange rates, interest rates, and inflation were all statistically significant and negatively correlated with return on equity (ROE) and return on assets (ROA), suggesting that macroeconomic instability has a detrimental effect on the profitability, operational effectiveness, and return to shareholders of businesses. Government revenue was statistically significant and positively associated with performance inferring better macroeconomic stability, reduction in bottlenecks of production and an improvement in firms' profitability.

Based on the findings, the following recommendations are made:

- i. The negative and statistically significant coefficient of exchange rate ($\beta = -0.062$) indicates that the corporate managers of manufacturing companies should embrace foreign exchange risk management techniques such as forward contracts, hedging and higher sourcing of domestic raw materials in order to mitigate the negative impact of foreign exchange rate fluctuations on the return generated from the investments (ROA and ROE). The policy makers such as CBN should also establish a more stable foreign exchange policy.
- ii. Since the coefficient of interest rate is negative ($\beta = -0.041$) and statistically significant as it shows that the interest rate has negative impact on performance. So, managers of corporate firms should be reducing excessive use of expensive credit and promoting internal finance by retained earnings and equity finance, however it will help to reduce financial ex-ante risk and increases profitability. CBN should also implement the interest rate policy to ensure that interest rate should be at levels that could help to control inflation as well as making borrowing affordable to manufacturing sector to flourish.
- iii. Since the negative coefficient of inflation rate ($\beta = -0.035$) affects performance, firms should implement cost-control strategies such as efficient procurement systems, local sourcing of inputs, and dynamic pricing strategies to cushion the impact of rising costs. Government should even it more to control inflation at the targeted rate and stabilize the level of prices in order to safeguard profitabilities in manufacturing sector and full confidence of investors.

- iv. Since government income has a positive ($\beta = 0.057$) and significant impact on performance, government should see to it that the revenues garnered are transparent use for infrastructure inflow including power, transport and industrial facilities. The cost of production for these making firms will therefore come down while operational efficiency and profitability will rise. Fiscal discipline must be maintained for macroeconomic stability to be sustained for manufacturing growth.
- v. Since firm size has a positive coefficient ($\beta = 0.029$), manufacturing firm should pursue growth strategies such as capacity expansion, strategic alliances, and market diversification to benefit from economies of scale and improved financial performance.
- vi. Since firm age has a positive coefficient ($\beta = 0.018$) younger manufacturing firms should strengthen organizational learning managerial capabilities and operational experience to improve their long term financial performance and competitiveness

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