

EXCHANGE RATE VOLATILITY AND FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS IN NIGERIA

Adeyemi, Olanrewaju Olamide¹; Akanbi, Jonathan Adetoyese²; Obasi-Ofia, Ofia³;
& Orokwano-Reuben, Ese⁴

*Corresponding Author: olamidelanre315@gmail.com 07069767136

^{1,2,3,4}Department of Accounting, Finance & Taxation Caleb University, Imota, Lagos

Abstract

This study examined the effect of exchange rate volatility on the financial performance of manufacturing firms in Nigeria, using return on assets, return on equity and return on capital employed as the dependent variable and exchange rate, balance of payment and inflation rate as independent variable. The study used ex-post facto research design with data collected from five manufacturing firms that involved in export-oriented activities in Nigeria. A Analysis of panel data from 2004 to 2023 revealed that exchange rate volatility had significant effect on ROA with F-stats p-value of 0.000. Conversely, exchange rate volatility had an insignificant effect on ROE with F-stats p-value of 0.09. Exchange rate volatility had an insignificant effect on ROCE with F-stats p-value of 0.08. The study emphasized the importance of strategic, efficient public expenditure allocation to foster sustainable economic development. The study recommended that government should implement policies to stabilize exchange rates, reducing cost pressures and improving profitability for manufacturing firms in Nigeria.

Keywords: Balance of payment, Exchange rate, Inflation rate, Return on assets, Return on capital employed; Return on equity

1.0 Introduction

Fluctuations of the exchange rates have been increased to companies, and to Nigeria in particular. The fluctuation of the Naira against other currencies may create a volatile movement of the revenue, cost, and overall business performance (Okonkwo & Ukoh, 2020). Currency volatility is one of the main threats that face these businesses as it may have a rapid impact on profitability. Naira devaluation would, say, drive the revenues of the firm up, and at the same time, the price of the imported inputs might go high; hence the reduction in profit margins (Nwagbala, et al., 2023). This uncertainty may also disrupt the pricing policies, therefore making it even harder to operate businesses competitively on the global markets (Etemad, 2020).

Exchange rate volatility also affects financial performance as well as business planning and forecasting (Zhakupova & Niyazbekova, 2020). Companies are unable to predict upcoming expenses and profits, and preparing long-term strategy is challenging in this regard (Siegel, 2021). The exchange rate volatility also complicates the process of getting loans and investing internationally because investors might be concerned with unpredictable patterns

of returns in times of high volatility of currencies (Morina, et al., 2020). In line with that, liquidity, effective operations, and financial viability of a company can be affected by the exchange rate variation (Yeboah & Takacs, 2019). The study explores the examination of its effects on their cost of operation, profits, and financial performance. Through the use of financial data of manufacturing companies to the exchange rate volatility.

Fluctuating foreign exchange rates have been a never-ending problem to business particularly the businesses that are engaged in manufacturing, especially the export-oriented firms. Such fluctuations of the naira against major world currencies, including the euro and the US dollar, render it all too difficult for the business to plan and regulate its financial performance (Morina et al., 2020). The massive worry is the cost of machines and raw materials that are bought through the use of most of the foreign currency. Flour Mills of Nigeria Plc and FTN Cocoa Processors Plc, as an illustration, greatly rely on imports (Gbededo, et al., 2024).

All this is aggravated by overall economic state of affairs in Nigeria. Naira also stands prone to any fluctuations in world crude oil prices as it sources its exports through it thereby undermining the values of currencies. These macroeconomic instabilities directly affect the manufacturing companies which are involved in importation and exportation of their goods since they are struggling to stay profitable amidst the variations in the foreign exchange rates.

1.1 Objectives of the Study

The main objective of this study is explore the exchange rate volatility effect on financial performance of selected manufacturing firms in Nigeria. Its specific aims are to:

- (i) Determine the effect of exchange rate volatility on return on assets of selected manufacturing firms in Nigeria.
- (ii) Ascertain the impact of exchange rate volatility on return on equity of selected manufacturing firms in Nigeria.
- (iii) Evaluate the impact of exchange rate volatility on return on capital employed of selected manufacturing firms in Nigeria.

1.2 Research Hypotheses

The following hypotheses were developed to achieve the objectives of the study:

- H₀₁: Exchange rate volatility has no significant impact on the return on assets of selected manufacturing firms in Nigeria.
- H₀₂: Exchange rate volatility has no significant impact on the return on equity of selected manufacturing firms in Nigeria.
- H₀₃: Exchange rate volatility has no significant effect on the return on capital employed of selected manufacturing firms in Nigeria.

2.1 Conceptual Review

The conceptual review was concerned with the association between the parameters of exchange rate volatilities such as exchange rate, balance of payment, and inflation rate to

the parameters of financial performances such as ROA, ROE, and ROCE. It also offers a theoretical basis through which one can understand the influence of the exchange rate volatilities on the financial performance as it explores these concepts with regards the case of the chosen manufacturing companies in Nigeria.

Exchange Rate Volatility

Exchange rate volatility is the uncertainty of the changing price of one currency relative to the other (Bush & Noria, 2021). Some of the factors which influence these changes include the interest rate changes, inflation rate changes, and macroeconomic policies among others. The instability in the rate of currency in developing countries, especially Nigeria is of real concern due to the impacts of international trading and international monetary stability.

Exchange Rate

The exchange rate is the value of one currency with regard to the other, is an imperative attribute in terms of international trade and economic policy (Chen et al., 2020). It impacts the balance of trade in a country, inflation, flow of investments and economic stability. It is essential since the economy of Nigeria relies much on the export of oil and entails appearances of the majority of foreign exchange earnings of the entire country (Herrero & Rial, 2023). Exchange rates may be either floating or fixed depending on the way they are set. Floating exchange rates are determined by the market forces whereas the central bank of a country ensures fixed exchange rates to stabilize trade and control inflation.

Balance of Payment

This is what covers what has been transferred financially, invested in and what has been the exchange of goods and services it keeps track of money transferred and payments received between a national and the outsider. The BOP is (Krukovi, 2022) significant in the process of assessing the macroeconomic equilibrium and how a given nation can engage in helping in foreign investment and trade. One whose current account is in surplus performs better on net basis relative to what it imports and reverse happens in the country where current account is in deficit (Marimuthu et al., 2021).

Inflation Rate

It is one of the economic sparkers that determines the fiscal and monetary policy as well as demonstrates the state of the economy in a country. Although the moderate form of inflation is considered a signal of growth, high inflation causes destabilization of the economy, reduction of savings, and loss of purchasing power (Ibe, 2024). Among the developing countries such as Nigeria, inflation is often triggered by external factors such as fluctuations in the price of commodities in the international market and fluctuating exchange rates.

Financial Performance

Financial performance describes the extent to which an organization can generate income, defray expense and achieve profitability within a stipulated period of time (Barauskaite & Streimikiene, 2021). It is one of the most important measures that ought to be carried out in companies whose priorities lie within the manufacturing business, in order to do an overall analysis of the review to evaluate the health of an organization, effectiveness and sustainability. The measures look into the feasibility of the earning, the financial soundness and effectiveness of operation of the companies (Barauskaite & Streimikiene, 2021).

Return on Assets (ROA)

In the number of firms whose operational orientation is manufacturing, it has not been left out since it has attained the significance of an instrument in gauging the profitability and efficiencies of operation of a firm in addition to providing the notions about the relative asset performance of the specific firm on converting assets to profits (Olayinka, 2022). The role of the returns on assets is especially critical since it enables the companies to engage predominantly in asset-based activity, which generates income (Olayinka, 2022).

Return on Equity (ROE)

It is among the most important indicators that enable one to understand how well the operations of the company or its management can be in terms of financial stability as it forecasts how well the company would be able to make money on the investments the members of the company made (Sari et al., 2023). Return on equity is quite crucial in the banking industry because it can be utilized as a yardstick by which the degree to which shareholders have been creating value can be established. The effective use of equity capitals to enhance profitability through which an improved level of return on equity is witnessed is what contributes to sustaining the confidence that investors have (Sari et al., 2023).

Return on Capital Employed (ROCE)

Return on capital employed (ROCE) is the indicator of financial performance which has ascertained the level to which the firm has been able to recognize a profit on capital invested. It is calculated as a percentage which indicates the kind of relationship between the operating profit and the amount of capital being used. This is a key factor for both the investors and the management because it may show how much a firm exploits its earnings to generate a ROI by quantifying the profit to profit in their terms (Naz et al., 2022). The operating efficiency measure Return on capital employed is sometimes thought to be a full indicator as it establishes equity and loan capital.

2.2 Theoretical Review

This study is explained by the following theories:

Resource-Based View (RBV) Theory

Resource-Based View (RBV) of the firm is primarily founded on Jay Barney who advanced it in 1991. This theory clarifies that it is the resources of the business that bring about

competitive advantage and better performance of a business and not the ability of that company to position itself in the market and compete with other businesses. In this sense, the perception of resources is an appealing resource both tangible and intangible that every firm can utilize in order to post sustainable competitive advantages and supernormal financial performance (Stan, et al., 2024). The major assumption of the RBV is that companies have distinctive resources that make them successful, i.e., the corporate capabilities, technology, human workforce, or brand image.

Agency Theory

Agency theory which was initially used by Michael Jensen and William Meckling in 1976 focuses on the interaction between the principals (owners) and the agents (managers). It attempts to eliminate conflict of interest which arises whenever the agents are ordered to fulfill the duty of acting on behalf of the principals. On this note, the principals entrust the agents with the decision-making capabilities, which can have their agendas as against the principals. According to the theory, the objectives of the agent might not equally be the objectives of the principal, therefore making agency costs to bring forth the alignment of the objectives of the agent and the objectives of the principal (Jensen & Meckling, 2019). The reward systems would help to harmonise the Principal and Agent motives which underscored the need to use reward and watch schemes to save on spending on the agency (Nguyen et al., 2020).

2.3 Empirical Review

The study by Zhang et al. (2023) examined the importance of monetary exchange rate volatility exposure to the performance of machine-learning and longitudinal data in China till 2022. In their research paper they showed how, on the one hand, the companies that were highly technical and more diversified in the market felt less of the adverse effects of the change of exchange rates and therefore, the evidence thereof of the internal resilience towards dealing with the external shocks. The article by Okon et al. (2022) examined the influence of the exchange rate on the financial performance of the Nigerian oil and gas companies of the period 2000 and 2020. It is specifically decreased profit margin especially at the companies that need to depend much on borrowed input. The research advised the companies to incorporate protection measures through hedging to avoid risks posed by fluctuation in currency.

This was carried out by employing variation in exchange rate on the rate of returns on equity which is one of the important measures of manufacturing businesses in Nigeria (Ajayi & Hassan, 2023). They based their research on panel data (2010-2022) estimated based on the fixed-effects model. It was found out that in other companies where the amount of foreign input dependencies was high there was a noteworthy aspect of insignificance of the variables which was highly significant. Researchers suggested that any approach to enhance domestic sourcing needs to be embraced as a strategy of becoming resilient to the volatility of the exchange rates. Tanaka and Yamada (2023) assessed the effect of exchange rate volatility when calculating the return on equity of Japanese businesses with the help of dynamic panel model. They learned that companies that used sophisticated risk management strategies would include currency hedging resulting in less negative effect on the ROE even on the turbulent economic environment.

Liang and Zhou (2022) analyzed how the changes in the exchange rates affected the return on equity (ROE) of Chinese companies in 2010-2020. Through the panel data regression, they revealed the truth that companies whose foreign exchange budget was heavy realized a negative slope of ROE during the stages of uncertainties. Still, the strategic issue of market diversification that was potentially possible put a mark on its value because it helped to reduce the negative effect.

3.0 Methodology
Research Design

This explored the *ex-post facto* research design which implies that the given research analyzes the potential cause and effect relationships by studying an already established situation or condition and tries to find out plausible causes and effect in actual time. It mainly focused on identifying how the cause-and-effect relationship is established, and which are the independent and dependent variables.

Population of the Study

The research focused on five (5) of the twenty (25) enumerated manufacturing companies in Nigeria such as the Nigerian Breweries Plc, the Guinness Nigeria Plc, the Dangote Sugar Refinery Plc, the Flour Mill of Nigeria Plc and the Okomu Oil palm Company Plc. The reason to select these companies is that they have a huge contribution in the exportation of Nigeria that can either have a positive or negative effect in their financial results.

Method of Data Collection

In the case of Nigeria, the CBN statistical bulletin and audited annual reports of the chosen manufacturing companies in the time span of twenty (20) years between 2004 and 2023 were used. The secondary data was also acceptable and filled this study with sufficient information.

Method of Data Analysis

A descriptive statistic and inferential were employed in the analysis of data in order to make effects between the variables. The reason descriptive statistics have been employed in this research is that they are involved in outlining the fundamental characteristics of the information in research. Analysis of relation between variables to make conclusive remarks as to the study was done through inferential statistics. The estimation was made with the Econometric Views (E-views). The fact that panel regression models can easily estimate the extent to which the true relationship resembles the estimated relationship made the research apply these models in this study since it used the fixed model and the random effect model.

Model Specification

Then the linear regression model for each variable is developed to determine the relationship between the variables.

$$FP = f(ERV)$$

$$ROA_{it} = \beta_0 + \beta_1 ER_{it} + \beta_2 BoP_{it} + \beta_3 INF_{it} + \varepsilon_{it} \dots\dots\dots \text{Model 1}$$

$$ROE_{it} = \beta_0 + \beta_1 ER_{it} + \beta_2 BoP_{it} + \beta_3 INF_{it} + \varepsilon_{it} \dots\dots\dots \text{Model 2}$$

$$ROCE_{it} = \beta_0 + \beta_1 ER_{it} + \beta_2 BoP_{it} + \beta_3 INF_{it} + \varepsilon_{it} \dots\dots\dots \text{Model 3}$$

Where: ROA = Return on Assets; ROE = Return on Equity; ROCE = Return on Capital Employed; ER = Exchange Rate; BoP = Balance of Payments; INF= Inflation rate; β = Constant; ε = error term; t = Time

4.0 Data analysis and discussion of findings

Data for this study are analysed and findings therefrom discussed below:

Table 1: Descriptive Statistics

	ROA	ROE	ROCE	ER	BOP	INF
Mean	0.223575	0.350544	0.447483	2.319765	0.672086	8.722607
Median	0.126276	0.228530	0.295997	2.198727	0.670344	9.024425
Maximum	1.391965	4.460631	4.163344	2.805297	0.690849	13.69834
Minimum	-0.119791	-0.880082	-3.848720	2.073963	0.655792	4.206848
Std. Dev.	0.285671	0.517959	0.928676	0.212594	0.009470	2.495022
Skewness	2.248383	5.216080	-0.678259	0.686216	0.192583	0.067401
Kurtosis	7.433678	41.38259	11.36669	2.236954	2.001634	2.518319
Jarque-Bera	166.1600	6591.888	299.3404	10.27420	4.771196	1.042452
Probability	0.000000	0.000000	0.000000	0.005875	0.092034	0.593792
Sum	22.35745	35.05440	44.74830	231.9765	67.20859	872.2607
Sum Sq. Dev.	8.079200	26.55983	85.38152	4.474436	0.008879	616.2882
Observations	100	100	100	100	100	100

Source: Researcher's Compilation (2025)

The descriptive statistics reveal that ROCE (mean = 0.4475), ROE (0.3505), and ROA (0.2236) had the highest profitability averages, with standard deviations of 0.9287, 0.5180, and 0.2857 respectively, indicating high variability. Their maximum values: ROCE (4.1633), ROE (4.4606), ROA (1.3920) and minimums: ROCE (-3.8487), ROE (-0.8801), ROA (-0.1198) confirm the presence of outliers. ROE showed extreme skewness (5.2161) and kurtosis (41.3826). Jarque-Bera test probabilities (0.0000) confirmed non-normality. Conversely, ER (mean = 2.3198), BOP (0.6721), and INF (8.7226) had lower variability, with Jarque-Bera probabilities of 0.0059, 0.0920, and 0.5938, indicating greater macroeconomic stability.

Hypotheses Testing

Ho1: Exchange rate volatility has no significant impact on the return on assets of selected manufacturing firms in Nigeria

Table 2: Regression Model for Exchange rate volatility and return on assets (ROA)

Dependent Variable: ROA

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.577278	1.756274	-2.606244	0.0106
ER	-0.722238	0.139995	-5.159035	0.0000
BOP	9.506381	2.723695	3.490252	0.0007
INF	0.009994	0.011127	0.898118	0.3714
R-squared	0.310196	Mean dependent var		0.104786
Adjusted R-squared	0.288639	S.D. dependent var		0.272117
S.E. of regression	0.229509	Sum squared resid		5.056760
F-statistic	14.38997	Durbin-Watson stat		1.438742
Prob(F-statistic)	0.000000			

Source: Researcher's Compilation (2025)

The panel random effects regression shows that the exchange rate (ER) significantly and negatively affects return on assets (ROA), with a coefficient of -0.7222 and p-value of 0.0000, indicating that rising exchange rates reduce firm profitability. Balance of payments (BOP) positively influences the ROA, with a coefficient of 9.5064 and p-value of 0.0007. Inflation rate (INF), however, has no significant effect ($p = 0.3714$). The negative and significant intercept ($C = -4.5773$) implies ROA would be negative without these variables. The model explains 31% of ROA variation, with a Durbin-Watson statistic of 1.44.

Ho2: Exchange rate volatility has no significant impact on the return on equity of selected manufacturing firms in Nigeria

Table 3: Regression Model for exchange rate volatility and return on equity (ROE)

Dependent Variable: ROE

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.533078	3.730878	0.410916	0.6820
ER	-0.600759	0.297424	-2.019870	0.0462
BOP	0.332030	5.786596	0.057379	0.9544
INF	-0.001383	0.023640	-0.058522	0.9535
R-squared	0.062966	Mean dependent var		0.192532
Adjusted R-squared	0.033683	S.D. dependent var		0.496027
S.E. of regression	0.487602	Sum squared resid		22.82452
F-statistic	2.150290	Durbin-Watson stat		1.938899
Prob(F-statistic)	0.098946			

Source: Researcher's Compilation (2025)

The panel random effects regression shows that exchange rate (ER) has a significant negative effect on return on equity (ROE), with a coefficient of -0.6008 and a p-value of 0.0462. This implies that rising exchange rates reduce shareholder returns. However, balance of payments (BOP) and Inflation rate (INF) have no significant effect, with p-values of 0.9544 and 0.9535 respectively. The intercept is positive but insignificant ($p = 0.6820$). The model explains only 6.3% of the variation in ROE ($R\text{-squared} = 0.0630$), and the F-statistic (2.15) is also not significant.

Ho3: Exchange rate volatility has no significant effect on the return on capital employed of selected manufacturing firms in Nigeria

Table 4: Regression Model for exchange rate volatility and return on capital employed (ROCE)

Dependent Variable: ROCE

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.44247	6.571790	1.893315	0.0613
ER	-0.616539	0.523860	-1.176916	0.2421
BOP	-15.57995	10.19205	-1.528637	0.1296
INF	-0.010741	0.041638	-0.257965	0.7970
R-squared	0.066295	Mean dependent var		0.217424
Adjusted R-squared	0.037116	S.D. dependent var		0.875219
S.E. of regression	0.858823	Sum squared resid		70.80741
F-statistic	2.272058	Durbin-Watson stat		1.220364
Prob(F-statistic)	0.085085			

Source: Researcher's Compilation (2025)

Based on the findings, none of the variables significantly impact ROCE. ER has a negative coefficient of -0.6165 ($p = 0.2421$), while BOP also shows a negative effect (-15.5799, $p = 0.1296$). INF is statistically insignificant with a coefficient of -0.0107 ($p = 0.7970$). The intercept (12.4425) is marginally insignificant ($p = 0.0613$). The model explains only 6.6% of ROCE variation ($R^2 = 0.0663$), with a weak F-statistic ($p = 0.0851$).

4.2 Discussion of Findings

The findings reveal that exchange rate volatility significantly affects return on assets (ROA) but not return on equity (ROE) or return on capital employed (ROCE) in Nigerian manufacturing firms. This supports Avdjiev et al. (2019), who found that exchange rate fluctuations negatively impact asset use and operational costs. Using the Resource-Based View (RBV), ROA is impacted because firms rely heavily on imported inputs, making assets vulnerable to exchange shocks. However, the non-significant effects on ROE and ROCE contrast with Chawla and Manrai (2019), who reported strong impacts. Dae and Wamugo (2022) aligns with Agency Theory, suggesting that effective managerial

strategies such as hedging and diversification help shield equity and capital returns from exchange rate volatility.

5.0 Conclusion

This study concludes that volatility of the exchange rate had a significant effect on the return on assets of the randomly selected manufacturing firms in Nigeria whereby the effect of the exchange rate volatility on the performance of the operations of the manufacturing firms was explained. Nonetheless, it did not influence the return on equity and return on capital employed too much, which is likely to indicate that firms used monetary strategies to protect these ratios. The results also highlighted the necessity of proper management of the foreign exchange and internal controls of risk. The policymakers and managers were urged to take up actions that can support exchange rate stability and financial resilience.

5.1 Recommendations

The recommendation of this research study was that manufacturing companies should integrate the effective risk management strategies concerning the foreign exchange which include hedging and currency diversification to tackle the effect of foreign exchange volatility. It also recommended that policy makers take steps that will stabilize the exchange rate and make the environment more predictable in using the assets and making profits.

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