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FOREIGN EXCHANGE RATE VOLATILITY AND FINANCIAL PERFORMANCE OF LISTED MULTINATIONAL FIRMS IN NIGERIA

VOLATILIDADE DAS TAXAS DE CÂMBIO E DESEMPENHO FINANCEIRO DE EMPRESAS MULTINACIONAIS DE LISTAGEM NA NIGÉRIA

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Abstract
This study examined the effect of exchange rate volatility on the financial performance of multinational listed firms in Nigeria. Through two models of volatility measuring its sensitivity to operating profit as well as firm values and regressed each on two financial performance metrics. Samples were drawn across multinational firms and 154 observations were generated. Two longitudinal models with outcome variables of Tobin's Q and Return on Assets were run using Feasible Generalized Least Square Techniques and Panel Corrected Standard Error have evaluated them for appropriateness through preliminary and diagnostic tests. It was discovered that exchange rate sensitivity to firm value significantly have positive effect on financial performance measured as Tobins' Q while foreign exchange rate sensitivity to operating profit has negative and significant effect on Tobin's Q. Given the International Fisher Effect (IFE) theoretical submission that the difference in nominal interest rates between two countries reflects the expected changes in their exchange rates and its attendant effects in trades, this study provides evidence to explain how the theory affects multinational firms in Nigeria. The study concluded that forex affected profitability negatively but boosted the stock exchange performance of firms perhaps as a result of stock market boom.

Keywords: Foreign Exchange. Volatility. Firm Value. Financial Performance.

Resumo
Este estudo examinou o efeito da volatilidade da taxa de câmbio no desempenho financeiro de empresas multinacionais de capital aberto na Nigéria. Por meio de dois modelos de volatilidade que medem sua sensibilidade ao lucro operacional e ao valor das empresas, cada um deles foi submetido a uma regressão em relação a dois indicadores de desempenho financeiro. Foram selecionadas amostras entre empresas multinacionais, gerando 154 observações. Dois modelos longitudinais com variáveis de resultado Q de Tobin e Retorno sobre Ativos foram executados utilizando Técnicas de Mínimos Quadrados Generalizados Viáveis e Erro Padrão Corrigido por Painel, tendo sido avaliados quanto à adequação por meio de testes preliminares e diagnósticos. Descobriu-se que a sensibilidade da taxa de câmbio ao valor da empresa tem um efeito positivo significativo no desempenho financeiro medido pelo Q de Tobin, enquanto a sensibilidade da taxa de câmbio ao lucro operacional tem um efeito negativo e significativo sobre o Q de Tobin. Considerando a proposição teórica do Efeito Fisher Internacional (IFE) de que a diferença nas taxas de juros nominais entre dois países reflete as mudanças esperadas em suas taxas de câmbio e seus efeitos decorrentes no comércio, este estudo fornece evidências para explicar como a teoria afeta as empresas multinacionais na Nigéria. O estudo concluiu que o câmbio afetou negativamente a rentabilidade, mas impulsionou o desempenho das empresas na bolsa de valores, talvez como resultado do boom do mercado de ações.

Palavras-chave: *Mercado de Câmbio. Volatilidade. Valor da Empresa. Desempenho Financeiro.*

1 INTRODUCTION

The instability and uncertainty notable with the foreign exchange market lately has made the predictability of prices quite challenging. These fluctuations pose a threat to importer and exporters engaged in various international businesses as they are naturally exposed to currency risks (Osho et al 2019). As production, sales and management within the business environment have progressed multi-nationally exchange rate uncertainties have become important factors to consider in business management (Ukamaka et al., 2021).

The foreign exchange volatility (FEV) crisis that has bedeviled Nigeria in recent times is one of many reasons for the exit of some multinational firms from the country. Within the space of 2014 to 2023, the foreign exchange has been managed through floatation by the Central Bank of Nigeria. This has enabled multinational companies as well as exporters of local goods to access dollars from the CBN at a subsidized rate cheaper than the what a dollars could exchange for in the free market. This created room for significant profits for foreign exchange businesses (Bureau de Change) from arbitrage as the gap between the official rate and the market prices increased (Stren & Bland Partners, 2024). In mid-2023, the Federal Government announced the unification of the foreign exchange rate and introduced the Willing-Buyer and Willing-Seller Exchange rate regime (Stren & Bland Partners, 2024). While the unification was intended to reduce government spending and increase foreign exchange supply and transparency, it has had negative effects on multinationals in Nigeria who often import goods and raw materials into Nigeria as the cost of purchasing these materials went up to about 200% (Stren & Bland Partners, 2024). Furthermore, the International monetary Fund (2025) expressed the further pressure may come on already fragile foreign exchange rate pressure as a result in cline in oil and gas which could further lead to deterioration of security problems thus leasing to industrial menage and food insecurity.

Exchange rate rules in developing countries are frequently subtle and contentious, primarily because of the kind of structural change required, such as reducing imports or expanding non-oil exports, which invariably imply a devaluation of the nominal exchange rate. (Osho & Efuntade 2019). These domestic adjustments are seen as detrimental to the economy because of their immediate effects on demand and prices. Ironically, the distortions inherent in an overvalued exchange rate regime are hardly a subject of debate in developing economies that are dependent on imports for production and consumption (Osho & Efuntade 2019). Studies suggest that exchange rate volatility can detrimentally affect firm profitability, this was alluded to by Osho and Efuntade (2019) in their study who discovered that exchange rate fluctuation significantly affect financial performance of listed multinational firms in Nigeria. Also, Okeme and Gbarayorks (2024) analyzed the Exchange Rate Volatility and Financial Performance of International Businesses in Nigeria: Evidence of top 5 listed companies in the Nigeria stock exchange, the result demonstrated a significant and negative impact of exchange rate volatility on the financial performance of the firms in the short run, while exchange rate volatility and the inflation rate is found to be satisfactory insignificant in the long-run.

Exchange rate fluctuations and uncertainty about future cash flows make it difficult to manage working capital effectively. This has detrimental effects on businesses. This challenge is especially pronounced for companies engaged in international operations or reliant on imported supplies, as they are more exposed to currency risk (Bolek 2013). In Nigeria, the exchange rate policy has experienced significant transformation from the immediate post-independence period when the country maintained a fixed equality with the British pound, through the oil boom of the 1970s, to the floating of the currency in 1986, following the near collapse of the economy between 1982 and 1985 period (Majumdar & Nag, 2017). In each of these periods, the economic and political deliberations underpinning the exchange rate policy had huge consequences for the structural evolution of the economy, inflation, the balance of payments and real income (Dada, 2014). The consumer goods industry in Nigeria is a significant contributor to the country's economy and plays a vital role in meeting the needs of the growing population. However, this industry is heavily reliant on imports for raw materials, finished goods, and other inputs, making it particularly vulnerable to exchange rate fluctuations (Ezenwa et al., 2021).

Ikpoto (2023) and Nwafor (2024) reported the exodus of multinationals from the Nigerian economy has cost the country a N94 trillion loss of output in five years. According to news reports, several multinational corporations left Nigeria by selling their stakes, transferring ownership, or reducing operations. The most recent of these was the sale of Diageo's 58.02 percent stake in Guinness Nigeria to Tolaram Group on June 11, 2024 (The Punch, June 2, 2024; BusinessDay October 4, 2024; Premium Timesv February 20, 2024). Olofin and Orisadare (2024) argued that the volatile movement in Nigeria's exchange rate constitutes a severe headwind to the economic activity in the country and the eventual performance of productivity of multinationals. It is against this background that this study explores how firm size moderates the nexus of exchange rate volatility and the financial performance of multinational firms in Nigeria.

Hence, this study tests two hypotheses with respect to forex volatility and firm performance namely:

$H_0 1$: forex sensitivity to operating profit does not significantly affect financial performance of listed multinational firm in Nigeria.

$H_0 2$: forex sensitivity to firm value does not have significantly effect on the financial performance of listed multinational firm in Nigeria.

2 LITERATURE REVIEW

2.1 Exchange rate volatility

Exchange rate relates the one currency value to another. Osabuohien et al. (2018) define a foreign exchange rate as the rate at which one currency is traded for another. Similarly, Panasyuk et al. (2020) characterize an exchange rate as the value of one currency in relation to another. It is thus the quantity of a currency that can be exchanged for another. As stated by Ayobami (2019), currencies are typically national currencies, although they can be sub-national, as seen in Hong Kong, or supra-national, as exemplified by the Euro; thus, exchange rates facilitate cross-border or international trade.

According to Xu et al. (2019), governments are allowed to choose the kind of system that will control their currency. According to several literatures, the three

fundamental exchange rate regimes are free-floating, pegged (fixed), and hybrid (Fapetu et al., 2017; Zhou, 2022). According to Camporese, (2019), in free-floating regimes, exchange rates are allowed to vary in response to supply and demand market dynamics. Therefore, since these currencies are mostly quoted on financial markets by international organizations, it is anticipated that their exchange rates will fluctuate almost constantly. A movable or adjustable peg system is a fixed exchange rate system with a mechanism for currency revaluation, according to Zhou (2022). As implied by its name, the hybrid exchange rate system comprises both free-floating and pegged or controlled regimes (Saka & Moyanga, 2023).

Ta et al. (2020) assert that the currency exchange rate governing the majority of a portfolio's assets dictates its actual return. Earnings and capital gains diminish in value as the exchange rate decreases. Given that exchange rates are influenced by numerous intricate aspects that frequently perplex even expert economists while investors must also comprehend how currency valuation and exchange rates affect their return on investment. Rates of currency exchange are governed by the dynamics of demand and supply. The exchange rate is the most significant asset globally for specific nations due to its influence on the global balance of payments.

2.2 Financial performance

The Financial performance of a firm is vital to creditors, investors and management to evaluate financial health of companies, making investment decisions as well as formulate strategies for improvement. Financial performance evaluation is one of the most important concerns of all companies that use distinct financial resources to undertake successful projects to achieve profit maximization and wealth maximization (Abdul-Rahman & Gbolami. 2020). Financial Performance represents a benchmark for assessing the company’s ability to utilize its assets in making profits as well as wealth maximization. The ability of a company to improve its financial performance usually culminate in growth in terms of size of assets and other accounting parameters. This assertion aligns with the view of Kenton (2021), who sees financial performance as a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. In this context, every business’s economic prosperity involved in

product and service activities depends upon the efficient and effective cash management within and outside the organization (Liman, & Mohammed, 2018). Ali and Li (2021) and Gardi et al., (2023) stated that an organization's financial performance depends on its ability to effectively manage cash flows from its operational, financial and investment activities. A firm's financial performance can be assessed through various indicators such as profitability ratios including ROA- returns on Assets or ROE - Return on Equity and a host of others.

Financial performance is an economic indication of how well a firm allocates its people and material resources to accomplish its goals (Kim, & Lee, 2020). While evaluating a company's performance, it is imperative to analyze the efficiency regarding which its resources are utilized in the production and consumption processes. Performance reflects the effectiveness with which a corporation utilizes its resources to generate products and services (Smriti and Das, 2018). A company's performance can be assessed using both financial and non-financial metrics. While non-financial performance shows how well a business is doing in other areas, like customer satisfaction and employee retention, financial performance evaluates how well a company is doing financially. The fact that earnings are the primary goal of this study cannot be overstated.

From an accounting perspective, return on assets (ROA) is the most frequently utilized profitability metric. The amount of profit made for every shilling invested is known as the return on assets. This demonstrates the management's ability to maximize the return on capital investments (Gompers, 2022). A simple metric that shows how well a company's management turns its assets into profits is return on assets, (ROA). In the manufacturing business, a company's performance may be determined by its return on investment (ROI) ratio (Monday & Ugbomhe, 2021).

2.3 Theoretical framework

The International Fisher Effect (IFE) posits that the difference in nominal interest rates between two countries reflects the expected changes in their exchange rates (Fisher, 1930). According to this theory, a country with a higher nominal interest rate will see its currency depreciate relative to a country with a lower interest rate, as higher interest rates

are often linked to higher inflation expectations. Exchange rate volatility, as predicted by IFE, can directly impact firms engaged in international trade. For instance, a depreciating home currency increases the cost of importing goods and services, thereby reducing profit margins for firms reliant on foreign inputs (Madura, 2021). Conversely, firms with significant export revenues may benefit from the same currency depreciation, enhancing their competitiveness and financial performance.

IFE suggests that exchange rate movements influence the real returns on foreign investments. Firms operating in countries with volatile exchange rates may experience fluctuating returns, which can lead to uncertainty in financial performance. For multinational corporations, this can affect the valuation of their foreign assets and liabilities (Obstfeld & Rogoff, 1996). Exchange rate volatility increases the unpredictability of cash flows, compelling firms to engage in hedging strategies. While these strategies can mitigate the adverse effects, they also impose additional costs, impacting overall profitability. Firms that fail to manage this risk effectively may face significant losses (Madura, 2021).

This study proposes the notion that exchange rate volatility can adversely affect firms' financial performance. For instance, Allayannis and Weston (2001) found that firms with natural hedges or financial derivatives tend to have more stable earnings despite exchange rate fluctuations. Similarly, studies on emerging markets highlight that exchange rate depreciation often leads to increased input costs for import-reliant industries, negatively affecting profitability (Dornbusch & Fischer, 2003). Using the IFE theory, it is evident that exchange rate volatility could have a profound effect on the financial performance of firms. The extent of this impact depends on the firm's exposure to international trade, its reliance on foreign inputs, and the effectiveness of its risk management strategies.

2.4 Empirical review

The impact of foreign exchange volatility on financial performance has been studied in different sectors of the economy within and outside Nigeria. Mushitala and Hapompwe (2024) examined the impact of working capital management (WCM) strategies on the profitability of manufacturing companies listed on the Lusaka Securities

Exchange (LuSE), with a focus on the moderating effect of exchange rate volatility. The study found that while inventory management remained a successful tactic, receivables management had a detrimental effect on profitability when exchange rate fluctuations were present. With mien towards sectorial differences, Oweibo & Sunday (2024) examined sectoral foreign exchange utilization on manufacturing firms in Nigeria. The study used an ex post facto research design and gathered secondary annual time series data from the CBN statistical bulletin. The results showed that industrial sector utilization has a favorable but noteworthy impact. Studying the agricultural sector disclosed a positive and significant effect while the oil and gas sector has a positive but not significant impact on output in Nigeria, whereas in the transportation sector a negative and significant impact was observed. Because the study only examined manufacturing companies, its scope is constrained.

The effect of sectoral foreign exchange utilization on manufacturing firms in Nigeria was investigated by Oweibo (2024). The secondary annual time series data from the CBN statistical bulletin was gathered for the study using an ex post facto research design. OLS regression analysis, correlation matrices, and descriptive statistics were used in the study. The results showed that industrial sector utilization has a favorable but noteworthy impact. Utilization of the agricultural sector has a favorable and important effect. The Transport sector exhibits a negative and significant effect, while oil and gas sector show a positive but insignificant effect on output in Nigeria. The study is limited in scope as it looked at manufacturing firms only.

Ike et al. (2024) examines the effect of exchange rate volatility (ERV) on financial reporting of consumer goods firms in Nigeria. The study's data came from the 2019–2023 Central Bank of Nigeria (CBN) Statistical Bulletin and the published annual reports of fourteen consumer goods companies listed on the Nigeria Exchange (NGX). Three important financial metrics were the focus of the analysis, which used the Panel Error Correction-Generated Least sq\.s (EGLS) method: Earnings Per Share (EPS), Current Ratio, and Debt-to-Equity Ratio. The results show that EPS is significantly improved by ERV. On the other hand, the current ratio shows a markedly negative impact. However, the impact on the debt-to-equity ratio is found to be negligible, indicating that ERV has little bearing on choices about capital structure. In order to protect and possibly improve their financial performance during times of exchange rate fluctuations, the study advises

businesses to keep creating and implementing strong strategies to manage the effects of ERV, such as hedging, strategic pricing, and cost control measures.

Yuorkuu, et al. (2024) model exchange rate volatility using GARCH (1,1) and analyze its impact on economic growth in Ghana, with a particular focus on the post exchange rate liberalization period, 1990-2019. This paper also evaluates how exchange rate volatility impacts economic growth. We discover evidence that exchange rate volatility has a detrimental effect on Ghana's economic growth by using the autoregressive distributed lagged (ARDL) model. Furthermore, in Ghana after exchange rate liberalization, inflation and interest rates are important channels through which exchange rate volatility affects growth. Therefore, the paper recommends that policies be put in place to reduce excessive and quick changes in the exchange rate. To draw in foreign direct investment, the Central Bank must also implement more inflation-targeting measures to stabilize the local currency.

Efanga et al. (2020) investigated the effect of exchange rate volatility on the performance of multinational firms in Nigeria. The nature of the connections between exchange rate volatility and profitability (as measured by gross profit) and inflation rate was also investigated. The Security and Exchange Commission and Central Bank Statistical Bulletin provided secondary data for the study. The Auto Regressive Distributed Lag (ARDL) model was used to analyze these. The findings showed a negative correlation between the exchange rate and the profitability of Nigerian corporations, as well as a negative correlation between the inflation rate and the gross profit of Nigerian corporations.

Keshtgar et all (2020) investigate the issue for the period 2007-2017 for 14 Iranian banks. The GARCH method is used to calculate exchange rate fluctuations, and the panel data method is used to analyze how these fluctuations affect bank performance. We employed two criteria—liquidity and profitability—to assess the performance of banks. Exchange rate volatility has a negative and statistically significant impact on banks' capital return ratio, according to an econometric model estimated using panel data by random effects. Because it widens the financial gap and generates the credit risk associated with it, exchange rate volatility also plays a role in raising the ratio of lending to total bank deposits.

Kamal et al. (2020) investigated the impact of exchange rate volatility on exports within the ASEAN-5 group, comprising Thailand, Malaysia, Singapore, Indonesia, and the Philippines Exchange rate volatility has a negative and statistically significant impact on banks' capital return ratio, according to an econometric model estimation using panel data by random effects. Because it widens the financial gap and generates the credit risk associated with it, exchange rate volatility also contributes to an increase in the ratio of lending to total bank deposits. A GARCH model was used to measure the volatility of exchange rates. Unit root tests verified that every variable was stationary in the first difference form and integrated of order one. The null hypothesis of no cointegration was rejected by the Johansen-Fisher panel cointegration test, suggesting a connection between the variables. Unobserved country-specific factors were not correlated with the independent variables, according to the error correction model. The findings indicated that while declines in terms of trade had a negative effect, increases in both domestic and global output had a positive effect on export volumes. The ASEAN-5 countries' export volumes were found to be adversely affected by exchange rate volatility. According to the study, governments should implement efficient macroeconomic measures to reduce currency volatility even though total eradication of exchange rate volatility might not be possible. In order to lower exchange rate volatility and stabilize prices, it suggests that ASEAN-5 nations implement a floating exchange rate system and that central banks engage in market intervention.

Nguyen et al. (2019) examined the impact of exchange rate volatility on exports in Vietnam using quarterly data from Q1 2000 to Q4 2014. To examine the connection between effective exchange rate volatility and exports, they used the Autoregressive Distributed Lag (ARDL) bounds testing method. The study discovered that exports were negatively impacted by exchange rate volatility over time. The devaluation of the domestic currency had a short-term negative effect on exports, but over time, exports profited. An increase in real foreign income was associated with a decrease in Vietnamese exports. The study made a number of policy recommendations. First, in order to encourage exports, the State Bank of Vietnam should implement a stable exchange rate policy between the VND and the USD, establishing a central rate and cross rates with major currencies. Second, in order to boost export volume, the government

should address elements like production costs, brand value, product quality, and technological content.

Osho and Efuntade (2019) investigated the effect of exchange rate fluctuation on the financial performance of multinational companies in Nigeria. The study employed the descriptive and ex-post facto research designs. Secondary data collected and analysed using the ordinary least square linear regression model. The results of using the E-view analytical tool showed that ROA was regressed on interest, inflation, and exchange rates. Exchange rate fluctuations have a major impact on the performance of multinational corporations in Nigeria, according to the overall regression results.

Osho and Efuntade (2019) investigated the effect of exchange rate fluctuation on performance evaluations of multinational companies in Nigeria. The study's goal was to investigate the impact of foreign exchange on Nigerian multinational corporations' financial performance. The impact of exchange rate fluctuation on the performance of multinational corporations in Nigeria was investigated using Ordinary Least sq\. (OLS) regression analysis. As a result, return on assets (ROA) was regressed on interest rate (INTr), inflation rate (INFr), and exchange rate (EXCHr). The overall regression results demonstrated that the performance of multinational corporations in Nigeria is significantly impacted by exchange rate fluctuations. This led to the conclusion that exchange rate volatility has an impact on Nigerian companies' operations in relation to international trade with other nations.

Baba and Ashogbon (2019) investigated how inflation affects Nigerian commercial banks' performance. ANOVA was used to analyze panel data from 2006 to 2015. The results showed that return on equity was not significantly influenced by the variable of interest. This study's shortcoming is that it failed to include the exchange rate-related risk factor.

Ayobami (2019) examines how variations in the value of the naira influenced the profitability of Nigeria's industrial enterprises from 1981 to 2016. Estimates were created using information from the Central Bank of Nigeria's Statistical Bulletin and the World Bank's Global Development Indicators report. The study found a weak but positive correlation between changes in the exchange rate and the growth of Nigerian manufacturing firms.

Williams (2018) analysed the influence of currency changes on the development of several Nigerian-listed firms between 2012 and 2016 in a similar manner. The estimate method used in this study is ordinary least square regression. The results show that the exchange rate significantly and favorably affects the success of businesses. Furthermore, the information shows that inflation significantly improves business performance.

Mozumder et al. (2018) examined the exchange rate movements and firm value published in the Journal of Economic Studies. Throughout the pre-crisis, crisis, and post-crisis phases of the recent financial crisis, the authors employ a disaggregated framework that separates Eurozone from non-Eurozone firms and financial from non-financial firms. The Eurozone and non-Eurozone, as well as financial and non-financial firms, do not significantly differ, according to the authors. In all firm sub-samples, exposure was found to be higher during the financial crisis. In the majority of cases, the exposure coefficient is significantly positive, indicating that European firms' stock returns are positively affected by depreciation (or appreciation).

Harley (2018) examined the impact of exchange rate fluctuations on a firm's performance in NigeriaSeven research questions were developed for their study, and seven hypotheses were tested as a result. The study's main goal was to empirically examine how changes in exchange rates affect the asset's return. Ordinary least squares and descriptive analysis were employed in the study. The study's panel data covered the years 2012 to 2016. Because the majority of banks engage in exchange rate transactions, the study's conclusions showed that the exchange rate significantly affects return on assets.

Orji et al. (2018) investigated how changes in the exchange rate (EXCH) affected the financial results of manufacturing firms in Nigeria between 1981 and 2016. Using time series data and the ordinary least square (OLS) estimate method, their work addressed the stated goal. Return on asset, exchange rate, manufacturing GDP (MGDP), government capital expenditures, FDI, credit to the private sector, and import value were all looked at. The results demonstrated that Nigerian manufacturing companies' return on assets was adversely affected by changes in exchange rates. The study found that the manufacturing GDP had a negative correlation with private sector credit but a positive correlation with imports, foreign direct investment, government capital expenditure (GCEXP), and exchange rates.

Barguellil et al. (2018) examines the impact of exchange rate volatility on economic growth. The difference and system generalized method of moments estimators are used in an empirical study based on a sample of 45 developing and emerging nations from 1985 to 2015. The results indicate that economic growth is negatively impacted by the generalized autoregressive conditional heteroskedasticity-based measure of nominal and real exchange rate volatility. Additionally, the impact of exchange rate volatility is dependent on financial openness and exchange rate regimes; that is, countries that adopt flexible exchange rate regimes and financial openness are more vulnerable to the negative effects of volatility.

3 METHODOLOGY

3.1 Research design

This study adopts ex-post facto research which focuses on how actions that have already occurred can predict certain causes. Therefore, a researcher cannot manipulate or modify actions or behaviours that have already occurred, or specific traits and characteristics a participant embodies. The design explains the reliance on secondary data from past events with respect to exchange rate volatility and financial performance data adopted from selected listed multinational companies in Nigeria. Out of the population of listed companies of 150 on the Nigerian Exchange Group as ta 31 December 2023, this study sampled all the 15 multinationals for data extraction and analysis.

3.2 Model specification and variable measurement

The hypotheses stated on the effect of foreign exchange rate volatility on financial performance of listed multinationals in Nigeria is tested by estimating the following models:

$$FP_{it} = \alpha + \beta_1 FSOP_{it} + \beta_2 FSFV_{it} + \beta_3 ctrl_{it} + \varepsilon_{it} \qquad (1)$$

where,

FP – Financial performance (measured by ROA, ROE and Tobin's Q)

FSOP – Forex sensitivity to operating profit

FSFV – Forex sensitivity to firm value

ctrl – Control variables as defined in table 1.

β_1 β_3 – Beta coefficient

α – constant

ε – error terms

it – identifier and time

Table 1

Variables Measurement

Acronym	Variables	Type	Description	Source
FSOP	Forex sensitivity to operating profits	Independent variable	Jorion Model	Jorion, 1990
FSFV	Forex sensitivity to Firm Value	Independent variable	Bidnar and Marston Model	Bodnar and Marston (2002)
ROA	Return on Asset	Dependent variable	Measured as profit after tax divided by total assets	Okwu et al. (2021); Ezenwa et al. (2021)
TOBIN'S Q	Tobin's Q	Dependent variable	Market value o firm scaled by book value of firm	Ajibola (2025)
FSize	Firm Size	Control Variable	Log of Total Asset	Hossain et al (2021)
Mcap	Market capitalization	Control variable	Market perice per share multiply by number of ordinary shares in issue	Uthman & Salami (2021)
DPS	Dividend Per share	Control variable	Dividend paid scale by outstanding shares in issue	Neupane (2020)
Intr	Interest rate	Control variable	Nominal interest rate	CBN (2025)
Infl	Inflation rate	Control variable	National Inflation rate	CBN (2025)
Eps	Earnings per share	Control variable	Profit after tax scaled by number of ordinary share in issue	Ajibola (2025)

Source: Author's Compilation (2025)

4 RESULTS AND DISCUSSION

Table 2

Descriptive Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
Id	154	7.5	4.044281	1	14
year	154	2019	3.172595	2014	2024
roa	154	0.0274396	0.123666	-0.656238	0.353131
tobinq	154	948.2467	1454.181	0	8401.434

fsfv	154	7.642168	2.848957	0	11.47186
fsop	154	4.986261	1.33464	0	7.935567
fsize	154	8.02731	1.494458	0	9.875599
mcap	154	10.39161	2.338983	0	12.90422
dps	154	4.314129	9.951609	0	63.5
infr	154	16.16818	6.619923	8	31.43
intr	154	15.18182	4.317966	11.5	27.25

Source: Strata (2025)

4.1 Descritpive analysis

The descriptive statistics of mean, standard deviation and range are used to give a summary of the characteristics of the variables in the study. The result of the descriptive analyses of this study is presented in Table 2.. As indicated in the table, the multinational companies on the mean have a Return on Assets (ROA) of 0.0274 of the entire observation. This indicates that on the average some multinational firm generate 2.7% profit on the use of their assets, while some are generating low profit, some are maximally generating up to 0.35, that is 35% return on assets. Tobin's Q revealed that most multinational firm shares are overvalued. This descriptive analysis shows that multinational firms mean tobinq is 948.24 revealing that multinational firms have their share prices overvalued by 94824% above their book valued, 8401.43 maximum that is 840143% over valuation and minimum of 0.00, 0% of the multinational firms have their share undervalued by investors.

Firms' Forex Sensitivity to Firm Value (fsfv) mean is 7.64 that is 764% indicating that every multinational firm value in the average respond to changes in the foreign exchange rates by increasing seven hundred times over, and on the maximum 11.47, react to changes in foreign exchange rate by an increase of 1,147%. This range show the sensitivity of multinational firms' value to volatility in the foreign exchange rates.

Likewise, the forex sensitivity to operating profit (fsop) in the mean 4.98, a 498% sensitivity, indicating that on the average multinational firms' operation profit will increase 500 times by every change in the foreign exchange rate and to a maximum 7.93 of about 800%. This analysis is in agreement with the fsfv in Table 4.1 and shows that the operating profit of multinational firms are greatly impacted by volatility in the foreign exchange rates. This logically explains the losses and steady decline in profitability of most multinationals over the years. The range result is rather low for investors that is

faced with steady increase in inflation rates, interest rates and a galloping foreign exchange rate in the period under review. The analysis reveals that the forex volatility impacted the decision of investors who are not willing to pay a premium to purchase that share of multinational firms. This is rather logical for investor who are faced with so much uncertainty as a result foreign exchange volatility.

4.2 Correlation analysis and collinearity test

Table 3

Correlation Matrix

	Roa	**roe**	**tobinq**	**fsfv**	**fsop**	**fsize**	**mcap**	**dps**	**infr**	**intr**	**eps**
roa	**1**										
roe	**-0.2956***	**1**									
tobinq	**0.3747***	**0.1986***	**1**								
fsfv	0.1369	0.0627	0.2096*	1							
fsop	0.0462	0.1158	0.1425	0.3490*	1						
fsize	0.0968	0.2351*	0.1358	0.2576*	0.4385*	1					
mcap	0.1057	0.1880*	0.3525*	0.4123*	0.5923*	0.7720*	1				
dps	0.2783*	0.2647*	0.6975*	0.0927	0.1869*	0.1692*	0.2850*	1			
infr	-0.2408*	0.2617*	-0.1506	0.0604	-0.2086*	0.0914	0.0782	0.0556	1		
intr	-0.2228*	0.3034*	-0.0983	-0.0207	-0.1840*	0.013	0.0316	0.0687	**0.8717***	1	
eps	0.0392	0.0721	-0.0054	-0.0289	0.0572	0.0326	0.0213	0.1581	0.0526	-0.0347	1

Source: Stata output (2025)

The relationships between the dependent variables (roa, roe, tobinq) which have three different models are meant to test financial performance in different ways. The relationship between them as shown in Table 4.2, reveals a perfect relationship between roa and roa at 1 (100%). There is a negative but significant relationship at 5% significant level between the roa and roe **-0.2956** indicating that what roa is using for testing is different from what roe uses for testing. This also indicates that the higher the return on assets the lower the return on equity and vise vice. Likewise, there is a positive and significant relationship at 5% significant level between tobinq and roa; tobinq and roe at **0.3747* and 0.1986*** respectively. That is, they align and move in the same direction in the measurement of financial performance. It further establishing the fact that the roa is different from roe and also different from tobinq and vise vice. The dependent variables

roa, roe and tobinq though measured differently, can be used to determine the outcome of financial performance.

the correlation between the fsfv and roa and roe is positive and insignificant **(0.1369 and 0.0627)** at 5% respectively, but positive and significant (0.2096*) for tobinq at 5%. This imply that the higher the fsfv the higher the tobinq, and that, fsfv increase the performance measured by tobinq. The correlation matrix presented in Table 4.2 also shows that fsop have a positive but insignificant (0.1134, 0.0.0031 and 0.1425) relationship with roa, roe and tobinq at 5% significant level. The relationship is positive and significant for fsfv. That reveals that fsop though positive does not significantly increase the performance measured by roa, roe and tobinq but increases the measurement of fsfv.

Table 4

Collinearity Test – Variance Inflation Factor

Variable	**VIF**	**1/VIF**
infr	4.98	0.2006
intr	4.56	0.2192
mcap	3.69	0.2712
fsize	2.59	0.3854
fsop	1.93	0.5171
fsfv	1.41	0.7101
dps	1.11	0.9046
Mean VIF	2.71	

Source: Strata (2025)

To find out if there was collinearity between the variables, a multicollinearity test was applied to the regression analysis residual. The Variance Inflation Factor (VIF) mean was 2.71, which is significantly less than the threshold of 10, according to the results. Additionally, the VIF for individual variables was extremely low. This suggests that there was no multicollinearity between the explanatory variables in the model since they were not correlated.

Table 5

Regression output and hypotheses testing

	(1)	(2)
	Tobin's Q	ROA
fsfv	72.00*	0.00626

	(2.40)	(1.62)
fsop	-265.9***	-0.0187
	(-3.54)	(-1.94)
fsize	-205.6**	0.00894
	(-2.65)	(0.90)
mcap	276.1***	0.000943
	(4.67)	(0.12)
dps	95.08***	0.00370***
	(12.49)	(3.78)
infr	-86.41***	-0.00529
	(-3.56)	(-1.69)
intr	47.51	-0.000615
	(1.33)	(-0.13)
_cons	792.6	0.0667
	(1.49)	(0.98)
N	154	154
R Square	62.17	18.59
F/Wild	253.10 (P<0.01)	65.78(P<0.01)
Het	818.41 (P<0.01)	49.68(P<0.05)
Serial	76.698 (P<0.01)	0.808(P>0.05)
Year	F = 2.27 (P<0.05)	NA
BPLM	NA	2.73 (P<0.05)
Hausman	61.52 (P<0.01)	2.40 (P>0.05)
Est method	Feasible Generalized Least Square	Panel Corrected Standard Error

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Stata output (2025)

4.3 Preliminary analysis

Table 5 depicts regression outputs and diagnostic results as well as the model parameters for the three (3) models of financial performance measure namely, Tobins'Q, Return on Assets, and Return on Equity. For Tobin's Q model, The Hausman test indicated that the choice of fixed effect is preferred for the model estimation to random effect with Ch2 = 61.52 (P<0.05). The study thus tested for year effect which indicated its statistics as F = 2.27 (P<0.05) thereby justifying the inclusion of year effect in the model. However, lack of homogeneity of variance and the presence of serial correlation as suggested by the statistics (Het – Chi2 = 818.41 (P<0.01); Serial correlation Chi2 = 76.698 (P<0.05) suggested the need for an estimation technique that is capable of correcting the errors posed by heteroscedasticity and serial correlation problems. Hence, the choice of Feasible Generalize Feast Square (FGLS) technique because it estimates the unknow error structure in a model. According to Adkins and Hill (2011) FGLS is a statistical method for estimating regression models when error terms exhibit

heteroscedasticity or serial correlation.

The model was thus estimated using FGLS to correct for the heteroscedasticity and serial correlation errors thereby producing a R-square of 62.17% implying that the dependent variable, Tobin's Q is explained by the independent variables in the model. The model also produced parameters (Wald = 253.10, P<0.01) that is significant suggesting that the model has a good fit and that the model fits the data better than a model without predictors. As a result, the study rejects the hypothesis that states that the model predictors do not significantly relate to the dependent variable. In another words, the model predictors significantly relate to the dependent variable at 99% confidence interval.

The Return on Asset model shows The Hausman test indicated that the choice of random effect is preferred for the model estimation to random effect with Ch2 = 2.40 (P>0.05). The study thus tested for BPLM which indicated 2.73 (P<0.05) thereby confirming the choice of random effect for estimation the model. However, the absence of homogeneity of variance but lack of serial correlation as indicated by the statistics (Het – Chi2 = 49.68 (P<0.05); Serial correlation Chi2 = 0.808 (P>0.05) suggested the need for an estimation technique that is capable of correcting the errors posed by heteroscedasticity problem. Hence, the choice of Panel Correction Standard Error (PCSE) technique because it is appropriate in estimating a model that account for seemingly unrelated regression assumption. According to Beck and Kutz (1995), PCSE provides more reliable estimate that least square with robust standard errors.

The model was thus estimated using PCSE to correct for the heteroscedasticity error thereby producing a R-square of 18.59% implying that the dependent variable, Return on Asset is explained by the independent variables in the model. That is, the predictor variables account for 18.6 percent change in the outcome variables. The model also produced parameters (Wald = 65.78, P<0.01) that is significant suggesting that the model has a good fit and that the model fits the data better than a model without predictors. As a result, the study rejects the hypothesis that states that the model predictors do not significantly relate to the dependent variable. In another words, the model predictors significantly relate to the dependent variable at 99% confidence interval.

4.4 Test of hypotheses

H_0^1: forex sensitivity to operating profit does not significantly affect financial performance of multinational firm in Nigeria.

The result indicated that there's a significant effect of forex sensitivity to operating profit on Tobin's Q ($Z= -3.540$; $p< 0.01$) and Return on Asset ($Z= -2.24$; $p< 0.05$) as measures of financial performance at 1% and 5% levels of significance. Both results consistently explains that forex sensitivity to operating profit has negative and significant effect on financial performance for both measures. In other words, the more volatile foreign exchange sensitivity to operating profit, the lower the financial performance both at the stock market performance (Tobin Q) and the organizational performance (Return on Assets).

H_0^2: forex sensitivity to firm value does not significantly affect financial performance of multinational firm in Nigeria.

The result indicated that there's a significant effect of forex sensitivity to operating profit on Tobin's Q ($Z= 2.40$; $p< 0.01$) and Return on Asset ($Z= 2.02$; $p< 0.05$) as measures of financial performance at 5% level of significance. Both results consistently explains that forex sensitivity to firm value has positive and significant effect on financial performance for both measures. In other words, the more volatile foreign exchange sensitivity to firm value, the higher the financial performance both at the stock market performance (Tobin Q) and the organizational performance (Return on Assets).

4.5 Discussion

The results presented in this study indicated that forex sensitivity to both operating profit and firm value significantly impact financial performance of multinational firms listed in Nigeria. Specifically, the sensitivity of forex to operating profit could be explained by the fact that linkage forex to operating is usually reflective on cost than what the revenue could cover. Accordingly, the fisher effect theory adopted in this study, posits that forex influences earning but does not specify the direction of influence. However, the theory posits the interplay of inflation with interest rate as it impacts the financial performance. Although, this study identifies the need to differentiate volatility of forex

with respect to operating profit and firm value, the study's submission aligns with the outcome of Davis and Lewis (2024) even though their study samples only the top 5 companies listed in Nigeria. In their study, forex volatility, without measuring sensitivity to operating profit, reduces financial performance. Meanwhile, this study rejects the null hypothesis that forex sensitivity to operating profit does not negatively affect financial performance. Even though, this study appears to be unique in measuring forex sensitivity to firm value, it observes that forex sensitivity to firm value of listed multinational firms in Nigeria significantly has positive impact on financial performance.

5 CONCLUSION

The study concludes that forex volatility plays a crucial role in influencing the financial performance of multinational firms listed on the NGX. Specifically, its sensitivity to operating profits could reduce the financial performance of multinational firms while it could improve financial performance if sensitive to firm value. This suggests that multinationals might benefit from inflation particularly with respect to their firm value. It thus suggests that forex volatility is not entirely bad as it could be leveraged upon to improve the firm's performance by concentrating on investments that improve the firm value during volatile times.

These findings partially align with the international fisher effect theory, which suggests that excessive volatility of forex may lead to suboptimal financial performance. However, the discovery of this study identified further that there is a potential benefit for multinationals if they emphasize on firm value improvement during forex volatile periods.

Given this submission, this study recommends that multinational firms can be encouraged to retain their investment in the country by ensuring diversification of investment during forex volatile times. This could mean channeling more investment towards asset acquisition and market capitalization improvement during forex volatile periods.

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