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EFFECT OF FOREIGN EXCHANGE RATE FLUCTUATION ON PROFITABILITY OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract
The study determined the effect of foreign exchange rate fluctuations on the profitability of listed manufacturing firms in Nigeria. Specifically, the study examined the effect of foreign exchange rate, foreign exchange supply and foreign exchange reserve on Return on Assets of listed manufacturing firms in Nigeria. The study used the ex-post facto research design and ten (10) listed industrial goods manufacturing companies in Nigeria spanning from 2013 to 2022. Hypotheses testing were conducted using Panel Data Regression estimates at 5% significance level which revealed the following findings: foreign exchange rate has a negative and insignificant effect on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.7269); foreign exchange supply has a positive and insignificant effect on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.9641); foreign exchange reserve has a negative and insignificant effect on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.7659). The study recommends that manufacturing firms in Nigeria should develop and implement a robust currency risk management strategy as hedging mechanisms, such as forward contracts, options, or natural hedging through geographical diversification of revenue sources.

Key Words: *Foreign Exchange Fluctuation, Profitability, Return on Assets.*

Introduction
In the context of Nigeria, where manufacturing firms play a pivotal role in driving industrial development and economic progress, foreign exchange rate fluctuations exert a substantial influence on their profitability. These fluctuations directly impact the cost of imported raw materials, intermediate goods, and machinery necessary for manufacturing processes (Ezenwakwelu, Okolie, Attah, Lawal & Akoh, 2019). Gaining a comprehensive understanding of the dynamics and impact of these exchange rate fluctuations on the profitability of manufacturing firms assumes paramount importance for policymakers, investors, and stakeholders alike (Lawal, Saheed, Anfofum, Ato &A deshina, 2023). Such insights are vital for fostering sustainable economic growth, enhancing stability, and facilitating informed decision-making. When the local currency depreciates against foreign currencies the cost of imports increases, leading to elevated production costs for manufacturing firms. This, in turn, reduces profit margins and erodes the overall profitability of these firms. Conversely, during periods of local currency

appreciation, manufacturing firms may benefit from reduced import costs, leading to improved profitability (Chiagoziem, Okorontah & Ede, 2021).

Understanding the dynamics of foreign exchange rate fluctuations and their impact on manufacturing firm profitability is crucial for policymakers (Ita, Ekpo, Chike, Anthony & Loveth, 2023). It enables them to formulate effective strategies and policies that mitigate the adverse effects of currency volatility. Policymakers can explore avenues to promote currency stability, such as adopting appropriate monetary policies, managing foreign reserves, and implementing exchange rate mechanisms that balance competitiveness and stability. Additionally, policymakers can consider measures to support local manufacturing firms, including targeted incentives, export promotion schemes, and policies that foster import substitution industries. Investors and financial stakeholders also greatly benefit from a deep understanding of the impact of foreign exchange rate fluctuations on manufacturing firm profitability. Manufacturing firms themselves require a comprehensive understanding of foreign exchange rate fluctuations to develop effective risk management strategies and enhance their overall profitability (Ezenwakwelu, Okolie, Attah, Lawal & Akoh, 2019). They can employ various measures to mitigate the adverse effects of currency volatility, such as hedging against exchange rate risks, diversifying suppliers and markets, or adopting forward contracts to secure favorable exchange rates for future transactions. Nigeria's manufacturing sector is a key driver of employment, economic diversification, and export potential.

The foreign exchange market in Nigeria has experienced fluctuations over the years due to various factors, including changes in global economic conditions, trade imbalances, oil price volatility, and monetary policy decisions. Stable exchange rates reflect the true value of the domestic currency relative to foreign currencies, facilitating fair and competitive international trade (Abubakar, 2020). In this ideal scenario, manufacturing firms would be shielded from significant fluctuations in exchange rates, ensuring stable production costs, pricing, and profitability. However, foreign exchange rate fluctuations present challenges for listed manufacturing firms in Nigeria. The foreign exchange market experiences volatility and uncertainty, leading to frequent fluctuations in exchange rates (Adekola & Olayinka, 2021). Manufacturing firms are exposed to these fluctuations as they import raw materials, machinery, and equipment or engage in export activities (Agubata & Odubuasi, 2018). In fact, the rapid and unpredictable currency depreciations especially with the recent announcement by the federal government of Nigeria over Naira floating make it difficult for manufacturing firms to accurately plan, price their products, and manage their financial positions. These currency fluctuations resulted from factors such as global economic conditions, trade imbalances, geopolitical events, and policy decisions. As a result of the above, fluctuating exchange rates have led to increased costs of imported raw materials and production inputs, squeezing profit margins and eroding competitiveness (Ayobami, 2019).

As a result, this study examine the effect of foreign exchange rate fluctuations on the profitability of listed manufacturing firms in Nigeria while introducing exchange rate, exchange supply, exchange reserve and firm profitability as the moderator in the relationship. To achieve the objective of this study, section two provides the literature

review followed by a presentation of the theoretical framework and a review of empirical literature. The third section outlines the methodology employed in this study, while the fourth and fifth sections focus on the discussion of findings and conclude with recommendations for policymakers.

In view of the above objective, the following hypothesis was formulated:

$H_{0:}$ Foreign exchange rate, Foreign exchange supply or Foreign exchange reserve have no significant effect on the Return on Assets of listed manufacturing firms in Nigeria.

Conceptual Review

Foreign Exchange Rate Fluctuations

Exchange rate fluctuation refers to the continuous and unpredictable changes in the value of one currency relative to another currency over a period of time (Okika, Udeh & Okoye, 2018). These fluctuations occur in response to various economic, political, and market factors, and they can be both short-term and long-term in nature. Exchange rate fluctuations are driven by the forces of demand and supply in the foreign exchange market, where the value of currencies is determined by the interactions between buyers and sellers of different currencies (Alsamara & Mrabet, 2019). When exchange rates appreciate, it tends to lead to increased imports and reduced exports, while depreciation has the opposite effect, expanding exports and discouraging imports (Adekola & Olayinka, 2021). Such shifts in the terms of trade can impact the economic balance of payment between exporting and importing countries. Thus, foreign exchange rates play a critical role in connecting the price systems of different countries, facilitating international trade, and influencing a country's balance of payments position. Countries with consistently lower inflation rates tend to experience an increase in the value of their currency, as their purchasing power rises relative to other currencies (Abubakar, 2020).

Foreign Exchange Rate

Foreign exchange rate is the value of one currency in relation to another currency, representing the price at which one unit of a country's domestic currency exchanges for another country's currency (Ibekwe, 2021). It is essentially the recommended number of units of a currency needed to purchase one or more units of another currency (Chiagoziem, Okorontah & Ede, 2021). This concept can be described as the value of one currency with respect to another, and it plays a significant role in any economy, impacting domestic price levels, profitability of traded goods and services, resource allocation, and investment decisions (Abubakar, 2020). Foreign exchange rate can be expressed as the price of one country's currency in terms of another country's currency (Alasha, 2020). For instance, the Nigeria Naira's exchange rate against the U.S. dollar and other currencies reflects the value of the Naira relative to these foreign currencies. Exchange rates can be either nominal or real, and they fluctuate or float from day to day based on market dynamics (Adekola & Olayinka, 2021).

Foreign Exchange Supply

Foreign exchange supply refers to the total amount of foreign currency available in the foreign exchange market for purchase by individuals, businesses, and governments. It represents the quantity of foreign currency that market participants are willing to sell at a given exchange rate (Frenkel, 2019). The supply of foreign exchange is influenced by various factors, including the balance of trade, foreign investment flows, tourism revenues, and remittances from abroad (Jacque, 2013). When there is an excess supply of a particular foreign currency, its value may decrease relative to other currencies, leading to a depreciation in the exchange rate. The foreign exchange supply is driven by the willingness of market participants to sell their currencies at a specific exchange rate. It represents the quantity of foreign currency that is offered for sale, and it is influenced by various factors that play a significant role in shaping the dynamics of the global economy. One of the primary determinants of foreign exchange supply is the balance of trade, which refers to the difference between a country's exports and imports (Tümtürk, 2019). Foreign investment flows are another crucial factor impacting foreign exchange supply. Countries that attract foreign direct investment or experience significant portfolio investments typically witness an increase in demand for their currencies (Frenkel, 2019). Investors need the local currency to invest in the country, which contributes to a rise in its supply in the foreign exchange market.

Foreign Exchange Reserve

Foreign exchange reserves, often referred to as forex reserves or foreign reserves are a crucial component of a country's monetary and financial arsenal (Mahidud, Amin & Ahmed, 2021). They represent a stockpile of foreign currencies and other international assets held by a central bank or monetary authority (Nurjanah & Mustika, 2021). These reserves serve multiple purposes and play a critical role in ensuring economic stability, supporting trade, and safeguarding the country against external financial shocks (Talreja, 2014). The primary function of foreign exchange reserves is to provide confidence and security in a nation's monetary system. Holding an adequate level of reserves helps a country manage and mitigate risks associated with exchange rate fluctuations and potential financial crises (Alsamara & Mrabet, 2019). Foreign exchange reserves consist of various foreign currencies, such as the US Dollar, Euro, Japanese Yen, British Pound, and others. These reserves can also include assets denominated in other currencies, gold holdings, and Special Drawing Rights (SDRs) - an international reserve asset created by the International Monetary Fund (IMF).

Firm Profitability

Firm profitability refers to a company's ability to generate earnings or profits that exceed its expenses over a specific period (Ehiedu & Priscilla, 2022). It assesses the relationship between a company's generated profits and the investments made, reflecting management's efficiency in operations and the productivity of its capital. The profitability of a firm is indicative of its financial health and the outcomes resulting from management decisions (Abubakar, 2020). A company's profitability is considered favorable when it generates revenue exceeding the associated expenses incurred (Mureithi, Mukhongo & Datche, 2019). This involves measuring the results of the firm's strategies, policies, and operations in monetary terms. The entity may analyze its asset

utilization, market potential, or growth targets. This assessment can be done through trend analysis to evaluate performance over a defined period or comparative analysis against other firms in the same industry (Langat, 2017; Efanga, 2018). Key indicators of firm profitability, such as asset utilization, financial structure, and investment return, are expressed through various ratios. Commonly used accounting ratios, such as profit margin, Return on Assets, return on equity, and earnings per share, are used to measure firm profitability (Ezenwa, Ogbebor & Alalade, 2021). In this study, firm profitability is evaluated using the Return on Assets metric.

Return on Asset (ROA)

Return on Assets measures the profit earned per unit of assets and offers a reflection of how well a consumer goods firm's management utilizes the company's real investment resources to generate profits (Ibekwe, 2021). It serves as an indicator of how effectively the board and executives deploy the firm's assets and utilize them to their fullest potential. By evaluating the effectiveness of assets deployed, ROA provides investors with insights into the earnings the company generates from its capital investments. It reflects the efficiency with which a company's assets are used, making it a vital profitability ratio for analyzing a company's net income (Ehiedu & Priscilla, 2022). It demonstrates the effectiveness of management in leveraging the assets of a consumer goods firm.

Theoretical Review

International Fisher Effect Model, proposed by Irving Fisher in 1930, is a theoretical framework used to explain the relationship between nominal interest rates, inflation rates, and exchange rate movements in the context of international finance (Ezenwa, Ogbebor & Alalade, 2021). The theory thus establishes a link between interest rates, inflation rates, and currency exchange rate fluctuations (Lagat & Nyandema, 2016). The International Fisher Effect theory is relevant to the present study since it proposes that changes in exchange rates (that is, fluctuations in foreign exchange rates) can impact the cost of imported inputs and materials. When the Nigerian naira depreciates against foreign currencies, the cost of imported raw materials increases, leading to higher variable costs for manufacturing firms. This, in turn, can negatively affect the profitability of these firms as higher costs eat into their margins.

Empirical Review

Obasi and Okegbe (2023) determined the relationship between exchange rate and the financial performance of oil and gas firms listed in Nigerian Exchange Group, over a period of ten (10) years spanning from 2012 to 2021. Relevant data for the study were obtained from the published financial statements of six (6) sampled listed oil and gas firms on the Nigerian Exchange Group. Ordinary least square regression and robust least square regression analyses were used to test the relevant hypotheses. The findings indicated that there is a significant and positive relationship between exchange gain (loss) and Return on Asset of listed oil and gas firms in Nigeria. The study concludes that loss of earnings occurs due to a mismatch between the value of assets and that of capital and liabilities denominated in foreign currencies or a mismatch between foreign receivables and foreign payables that are expressed in domestic currency.

Doruk (2023) examined the effect of real exchange rate on the firm performance of Turkish manufacturing sector. The study covered the period from 2006 to 2017 for the Turkish manufacturing sector and data were analysed using GMM model. The obtained findings show real exchange rate has a significant effect on firm performance in the manufacturing sector in Turkey.

Azmi, Adam, Widiyanti and Malinda (2022) examined the effect of the dollar exchange rate and inflation on the profitability of PupukSriwidjaja Palembang. Profitability in this study was measured by Return on Assets (ROA) with the research period from 2014-2020. The data analysis technique for testing the hypothesis in this study used multiple linear regression. The study results concluded that the dollar exchange rate and inflation had a significant positive effect on the profitability (ROA) of PupukSriwidjaja Palembang.

Adekola and Olayinka (2021) conducted a study to examine the impact of fluctuating exchange rates on manufacturing performance in Nigeria. Data from the Central Bank of Nigeria Statistical Bulletin for the period 2010-2016 were analyzed using regression analysis, with a dummy variable used to explain exchange rate appreciation and depreciation. The empirical results indicated a significant relationship between exchange rates and the performance of manufacturing firms in Nigeria.

In a separate study, Chiagoziem, Okorontah, and Ede (2021) investigated the effect of exchange rate movements and volatility on the performance of manufacturing firms in Nigeria from 1985 to 2019. Data on exchange rates, Nigerian manufacturing output, bank loans and advances, and interest rates were sourced from the central bank of Nigeria's statistical bulletin. The researchers used the Augmented Dickey Fuller (ADF) unit root test to check the stationarity and order of integration of the variables. They employed ordinary least square log-log models and Generalized Autoregressive Conditional Heteroscedastic (GARCH) models to analyze the data. The results revealed that the appreciation of the Nigerian domestic currency had a significant positive effect on Nigerian manufacturing performance, while exchange rate volatility had a significant negative impact on Nigerian manufacturing output.

Ezenwa, Ogbebor, and Alalade (2021) aimed to determine the effect of exchange rate volatility on the Return on Assets of consumer goods manufacturing companies listed in Nigeria. The study utilized an *ex-post facto* research design and selected a purposive sample of fourteen consumer goods firms from the listed companies. Panel data and panel regression models were employed, with estimation carried out using both the fixed-effect model and random effect model. The appropriate model was determined using the Hausman test, and Exchange Rate Volatility (ERV) was computed using the GARCH approach. The findings indicated that exchange rate volatility had a negative and statistically significant effect on the Return on Assets of these consumer goods manufacturing companies.

Abubakar (2020) conducted a study to examine the effects of exchange rate volatility on the financial performance of deposit money banks in Nigeria. Using an *ex-post facto* research design, secondary data were collected from all nine deposit money banks with

international authorization listed under the Nigerian Stock Exchange (NSE). The sample size was determined using judgmental techniques. Multivariate regression was employed to analyze the data and evaluate the differences in the observed values of the variables. The study revealed that exchange rate fluctuations had no significant effect on Return on Assets (ROA) and Return on Capital Employed (ROCE) for the banks.

Alasha (2020) evaluated the effect of exchange rate fluctuation on the economic growth of Nigeria. Secondary data from the Central Bank of Nigeria (CBN) and publications from the National Bureau of Statistics (NBS) were used. The classical least regression model and Ordinary Least Square Method (OLS) were employed to analyze the data. The study found that exchange rate fluctuations had a significant positive effect on the economic growth of Nigeria.

Hossin and Mondol (2020) investigated the effects of exchange rate fluctuations on the financial performance of financial institutions in Bangladesh. The study reviewed theoretical and empirical studies on exchange rates and financial performance and collected secondary data from banks' consolidated financial statements and the World Bank database website. Measures of central tendency were used as descriptive statistics, and correlation analysis was employed to explain the association between Return on Assets (ROA), inflation rates, interest rate spread, and exchange rates. A multiple linear regression model was also used, with Return on Assets as the dependent variable and exchange rate fluctuations as the independent variable. The study revealed a weak negative association between exchange rate fluctuations and financial performance.

METHODOLOGY

The study employed an *ex-post facto* research design. The *ex-post facto* entails scrutinizing the connection between a dependent variable and independent variables after they have naturally taken place. Ten (10) out of thirteen companies that were listed on the NGX were filtered over the period 2013 to 2022. The study utilized secondary data collected from the Central Bank of Nigeria bulletin (2022) and the financial statements of selected manufacturing firms spanning from 2013 to 2022, resulting in a historical data timeframe of 10 years. This extended period was deemed suitable not only for the study's objectives but also for predicting future trends. The variables of the study comprises foreign exchange rate, foreign exchange supply, and foreign exchange reserve gathered to assess foreign exchange rate fluctuations. Simultaneously, data on Return on Assets were obtained from the firms' annual reports to gauge profitability.

Table 1 Operational Measurement of Variables

Name of Variable	**Type of Variable**	**Operational Definition**
Return on Assets	Dependent	Earnings After Tax/Total Assets
Foreign Exchange Rate	Independent	This is measured as the price of naira with respect to US Dollar at the end of each year.
Foreign Exchange Supply	Independent	This is measured as the amount of US Dollars inflow into Nigeria at the end of a fiscal year.

Foreign Exchange Reserve	Independent	This is measured as the amount of Nigerian assets denominated in US Dollars and are held by a Central Bank of Nigeria.

Source: Researcher's Compilation, 2023

In order to examine the extent to which foreign exchange rate fluctuations affect firm profitability among manufacturing firms in Nigeria, the regression function below was deployed.

ROA = f (FERT, FESP, FERV) ……Eqn 1.

Where,

ROA = Return on Assets

FERT = Foreign Exchange Rate

FESP = Foreign Exchange Supply

FERV = Foreign Exchange Reserve

f = functional notation.

However, the econometric form of the functional model above is expressed as:

$ROA_{it} = \alpha_0 + \beta_1 LogFERT_{it} + \beta_2 LogFESP_{it} + \beta_3 LogFERV_{it} + \mu_{it}$ ……Eqn 2.

Where:

α_0 = Intercept

$\beta_1 - \beta_3$ = are the parameters to be estimated in the equation

i = firm

t= period

The study employed descriptive analysis to provide a detailed description of the research variables. Pre-regression analysis using descriptive statistics was conducted on the dataset, examining mean, maximum, minimum, and standard deviation of the data. The main analysis involved regression analysis to determine the impact of foreign exchange rate fluctuations on firm profitability and ascertain the direction of the effect, if any. The econometric method utilized for the study was panel data regression estimation. To carry out both the descriptive and inferential analysis, the researcher utilized E-views 11 Statistical Software.

In hypothesis testing, the null hypothesis (H0) is accepted if the calculated p-value is equal to or greater than the chosen level of significance (typically set at 5% or 0.05). Conversely, the null hypothesis is rejected in favour of the alternative hypothesis if the p-value is less than the level of significance.

DATA ANALYSIS

Descriptive Statistics

The data for the study were sourced from both Central Bank of Nigeria statistical bulletin (2022) and the financial statements of the sampled firms from 2013 to 2022. Appendix A of this report houses the data extracts alongside their natural logarithm transformations.

Table 2 Descriptive Analysis

	ROA	*Foreign Exchange Rate*	*Foreign Exchange Reserve*	*Foreign Exchange Supply*
Mean	0.074381	302.4940	36572.12	1608.453
Median	0.068059	306.5000	37350.48	1471.025
Maximum	1.088969	460.0000	42847.31	3132.720
Minimum	-1.799173	157.2600	26990.58	68.04000
Std. Dev.	0.253772	99.72174	5173.872	843.7936
Skewness	-3.416914	0.014108	-0.675743	0.058508
Kurtosis	33.61277	1.900080	2.318816	2.507394
Jarque-Bera	4099.346	5.044251	9.543854	1.068141
Probability	0.000000	0.080289	0.008464	0.586214
Sum	7.438116	30249.40	3657212.	160845.3
Sum Sq. Dev.	6.375620	984498.1	2.65E+09	70486782
Observations	100	100	100	100

Source: Analysis Output using E-views 11 (2023)

The mean ROA of 0.0744 indicates a positive average Return on Assets for the listed manufacturing firms in Nigeria, suggesting overall profitability. The variability, as reflected in the standard deviation of 0.2538, is relatively moderate. However, the negative skewness (-3.4169) and high kurtosis (33.6128) suggest that the distribution of ROA is negatively skewed and exhibits heavy tails, potentially indicating outliers or extreme values. The Jarque-Bera statistic of 4099.346, along with the skewness and kurtosis values, indicates a departure from normality, emphasizing the need for caution when interpreting the mean as the representative measure.

The mean foreign exchange rate of 302.4940 suggests a central tendency in the exchange rates observed for the listed manufacturing firms in Nigeria. The range, from a minimum of 157.2600 to a maximum of 460.0000, indicates significant variability. The low skewness (0.0141) and kurtosis (1.9001) suggest a relatively normal distribution, supported by the Jarque-Bera statistic of 5.0443, which is not significantly different from the expected value for a normal distribution. Overall, the foreign exchange rate data appears to be more symmetrically distributed compared to the ROA data.

The mean foreign exchange reserve of 36572.12 indicates a substantial average reserve held by the listed manufacturing firms in Nigeria. The range, from a minimum of 26990.58 to a maximum of 42847.31, suggests significant variability in the reserves. The negative skewness (-0.6757) suggests a slight leftward skewness, indicating a potential concentration of firms with higher reserves. The kurtosis (2.3188) is relatively higher, indicating a distribution with heavier tails. The Jarque-Bera statistic of 9.5439 suggests a departure from normality, indicating that the distribution may not be perfectly symmetric.

The mean foreign exchange supply of 1608.453 suggests a moderate average supply for the listed manufacturing firms in Nigeria. The range, from a minimum of 68.0400 to a

maximum of 3132.720, indicates variability in the supply levels. The skewness (0.0585) is close to zero, suggesting a relatively symmetrical distribution. The kurtosis (2.5074) is higher, indicating a distribution with heavier tails. The Jarque-Bera statistic of 1.0681, along with the skewness and kurtosis values, suggests a distribution that is close to normal, though some caution is warranted given the statistical departure from perfect normality.

Test of Hypothesis

The results of the Period random effects regression helped to examine the effects of foreign exchange rate, foreign exchange supply and foreign exchange reserve on ROA.

$H_{0:}$ Foreign exchange rate, Foreign exchange supply or Foreign exchange reserve have no significant effect on the Return on Assets of listed manufacturing firms in Nigeria.

Table 3 Panel Regression Result
Dependent Variable: ROA
Method: Panel EGLS (Period random effects)
Date: 12/02/23 Time: 01:01
Sample: 2013 2022
Periods included: 10
Cross-sections included: 10
Total panel (balanced) observations: 100
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGFERT	-0.065726	0.187576	-0.350394	0.7269
LOGFESP	0.003884	0.086108	0.045108	0.9641
LOGFERV	-0.177658	0.594713	-0.298729	0.7659
C	1.033610	2.484013	0.416105	0.6784

	Effects Specification	
	S.D.	Rho
Cross-section fixed (dummy variables)		
Period random	0.048677	0.0401
Idiosyncratic random	0.238280	0.9599

	Weighted Statistics		
R-squared	0.206628	Mean dependent var	0.074381
Adjusted R-squared	0.097198	S.D. dependent var	0.250780
S.E. of regression	0.238280	Sum squared resid	4.939648
F-statistic	1.888214	Durbin-Watson stat	2.674420
Prob(F-statistic)	0.046733		

Unweighted Statistics

R-squared	0.202930	Mean dependent var	0.074381
Sum squared resid	5.081816	Durbin-Watson stat	2.688343

Source: Analysis Output using E-views 11 (2023)

The panel regression results as presented in Table 3 shows the impact of foreign exchange rate fluctuations on the profitability of listed manufacturing firms in Nigeria. The R-squared value is a measure of how well the independent variables explain the variation in the dependent variable. In this context, an R-squared of 0.206628 indicates that approximately 20.66% of the variability in the Return on Assets (ROA) of listed manufacturing firms is explained by the combined influence of the foreign exchange rate, foreign exchange supply, and foreign exchange reserve. The F-statistic is 1.888214, and the associated probability (0.046733) is less than the significance level of 0.05. Therefore, there is evidence to suggest that the model built by the independent variables (foreign exchange rate, foreign exchange supply, or foreign exchange reserve) has a joint statistically significant effect on the Return on Assets.

The Durbin-Watson statistic assesses the presence of autocorrelation in the residuals. In this case, the Durbin-Watson stat is 2.674420. The range of values for this statistic is between 0 and 4, where values around 2 indicate no significant autocorrelation. In this instance, the value of 2.674420 suggests a moderate positive autocorrelation, but it is generally close to the ideal value of 2.

The coefficient for LOGFERT represents the estimated change in the Return on Assets for a one-unit increase in the log of the foreign exchange rate. The coefficient of -0.065726 suggests a negative impact. However, the high probability value of 0.7269 which is greater than 0.05 implies that this effect is not statistically significant.

The coefficient for LOGFESP indicates the estimated change in the Return on Assets for a one-unit increase in the log of the foreign exchange supply. The coefficient of 0.003884 shows foreign exchange supply has a positive effect on ROA. However, the high probability value of 0.9641 that exceeded 0.05 indicates that this positive effect is not significant.
The coefficient for LOGFERV represents the estimated change in the Return on Assets for a one-unit increase in the log of the foreign exchange reserve. The negative coefficient of -0.177658 implies a negative impact on the Return on Assets. However, the high probability value of 0.7659 which exceeded 0.05 indicates that this effect is not statistically significant.

Specifically, the study aimed to analyze the influence of foreign exchange rate, foreign exchange supply, and foreign exchange reserve on the Return on Assets of these listed manufacturing firms.

The study's findings are as follows:

i. The foreign exchange rate demonstrates a negative and statistically insignificant effect on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.7269).
ii. Foreign exchange supply exhibits a positive and statistically insignificant impact on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.9641).
iii. Foreign exchange reserve displays a negative and statistically insignificant influence on the Return on Assets of listed manufacturing firms in Nigeria (p-value = 0.7659).

Conclusion and Recommendations

In the context of Nigeria, where the economy is susceptible to fluctuations in the foreign exchange market, understanding how these factors affect the Return on Assets of listed manufacturing firms is essential. This study aimed to investigate the relationship between foreign exchange rate fluctuations, foreign exchange supply, foreign exchange reserves, and the profitability of manufacturing firms in Nigeria. The negative impact of foreign exchange rate fluctuations on ROA underscores the heightened risk and uncertainty associated with currency movements. Manufacturers may face challenges in predicting costs, pricing strategies, and managing financial risks in the face of volatile exchange rates. However, the positive correlation between foreign exchange supply and ROA emphasizes the critical role of a stable and adequate foreign exchange supply in fostering a conducive environment for business operations. This stability allows manufacturers to plan effectively and ensures a consistent flow of inputs at reasonable prices.

Based on the foregoing findings, the following recommendations have were made:

i. Manufacturing firms in Nigeria should develop and implement a robust currency risk management strategy as hedging mechanisms, such as forward contracts, options, or natural hedging through geographical diversification of revenue sources.
ii. Manufacturing firms should advocate for stable and reliable foreign exchange policies since collaboration between the private sector and government authorities can contribute to creating an environment where businesses have consistent access to foreign exchange, facilitating smoother operations and supporting overall profitability.
iii. Regulatory authority such as Central Bank of Nigeria should reassess reserve management policies and strike a balance between accumulating reserves for economic stability and ensuring a competitive exchange rate is crucial. Policymakers should consider measures that enhance the effectiveness of reserve management, aligning it with the needs and competitiveness of the manufacturing sector.

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