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Effect of exchange rate fluctuations on the financial performance of Nigerian manufacturing firms: Evidence from food, beverage and tobacco Sector

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Abstract
This research study empirically examined the effects of exchange rate on manufacturing firm's financial performance in Nigeria from 2005 to 2014 fiscal years. Eight companies from food, beverage and tobacco manufacturing companies were sampled using purposive sampling technique. Secondary data were gathered from the companies' financial statement and Central Bank of Nigeria statistical bulletin. Ex post facto research design was employed and multiple regression analysis was the tool used in the data analysis. The findings indicate that exchange rate and inflation rate have positive effect while interest rate has negative effect though none is significant on the return on assets and return on equity of manufacturing companies in Nigeria. The study recommends among others that Government should provide credits to the manufacturing companies at a zero interest rate to help improve the profitability status of the companies.

Keywords: exchange rate, interest rate, costs, performance

1. Introduction

The performances of manufacturing companies in Nigeria are majorly affected by macro-economic factors. Among the macro-economic factors is the exchange rate which volatility directly affects the financial performances of manufacturing companies at the levels of economic exposure, transaction exposure and translation exposure. Nigeria has experienced chronic volatility in exchange rate which is informed by various policies of the federal government, from the immediate post independent period when the country maintained a fixed parity with the British pounds, through the oil boom of 1970s, to the floating of the currency in 1986, following the near collapse of the economy between 1982 and 1985 period [1]. In each of these epochs, the economic and political considerations underpinning the exchange rate policy had important repercussion to manufacturing companies and the economic evolution at large. The term exchange rate refers to the price at which the currency of one country can be converted to the currency of another [2]. It is the price of one country's currency expressed in terms of some other currency.

Fluctuation in exchange rate entails the volatility and variability in the rate of exchange that affects either positively or negatively the financial performance of manufacturing companies because their projected revenue and costs, alongside profit margin and earnings per share (EPS) are affected. In the view of [3], exchange rate depreciation results in high cost of importing raw materials and capital goods and this in turn raises the cost of production and reduces profits of the firm importing these items. If the firm attempts to pass the high cost of production to the consumers in the form of higher prices, will reduce its chance of national and international competitiveness, which will lower revenue.

Exchange rate is the latest development from the foremost Gold Standard by which a country's standard monetary unit was equivalent to a defined amount of gold of certain purity. This meant that note of a country on this system was convertible on demand on its Central Bank into the equivalent gold coin or the modified Gold Bullion Bars in 1925 [4]. The demise of Gold Standard was by the Bretton Wood's Conference in 1944, which instituted a successful effort that created a legal and institutional framework that facilitated global monetary cooperation as well as managing international exchange rates. Flexibility in exchange rate was introduced by the departure from Gold Standard which had a fixed rate of exchange between the currencies.

The flexibility in exchange rate that was occasioned by the fall of Bretton Wood imposed greater task on each government of the world to ensure stability and fair exchange of its currency with other nations. Just as [5] said, that the breakdown of the Bretton woods system induced variability in the rate of exchange worldwide, and the behaviour of exchange rate is said to determine the behaviour of several other macro-economic variables. In Nigeria, the goal of stabilizing the rate of exchange with other international communities of its trading partners was not achieved [6]. Subsequently, Nigeria embarked on currency devaluation in order to promote export and discourage import, so as to stabilize the exchange rate.

Pertinently, Movement in exchange rate is believed to influence the competitiveness of a firm, the value of its funds, as many companies borrow in foreign countries to fund their operations. In the other hand, the state of a country's economy affects the financial performance of the organisations operating in it. The general expectation of most investors and shareholders is that companies would perform well when the economy is performing well [7]. And Company's financial performance is judged by financial indicators as profit before

and after tax, Earnings Per Share, Price Earnings Ratio, Return on Assets, Return on equity and Net Assets per Share. Manufacturing industry in Nigeria is faced with many macroeconomic challenges which cause high instability to exchange rate [8]. Found that there is a relationship between exchange rate fluctuations and changes in interest rate [9]. reported also that there is a strong relationship between exchange rate fluctuations, interest rate and inflation rate. More so societal unrest as was caused by Boko Haram insurgency, militancy, inconsistency in government policies and currency speculation among others can also lead to a change in exchange rate. The challenges so mentioned is believed to have proportionate and direct effect on cost of production, cost of outsourcing raw materials, inadequate government support to local manufacturers. Invariably the international competiveness and the current and future cash flows of the manufacturing organisations, which could be measured by financial indicators, will be affected. In addition, [10], said that the impact of exchange rate on manufacturing sector had not received adequate attention. It is against this backdrop that this research is targeted at evaluating the effect of exchange rate fluctuations on the financial performance of manufacturing companies in Nigeria. The following objectives were set for the study;

1. To ascertain the effect of exchange rate fluctuation on the return on assets of Food, Beverage and Tobacco manufacturing companies in Nigeria.
2. To ascertain the effect of exchange rate fluctuation on the return on equity of Food, Beverage and Tobacco manufacturing companies.

1.1 Research Hypotheses

In order to guide and direct this study in its investigation especially in areas of collection and analyses of data and discussion of findings, the following hypotheses are created;

1. Ho: The exchange rate fluctuations do not have significant effect on Return on Assets of Food, Beverage and Tobacco companies.
2. Ho: Exchange rate fluctuations do not have significant effect on Return on Equity of Food, Beverage and Tobacco companies.

The paper is structured as follows: section two contains the review of related literature, the research methodology is presented in section three, the subsequent section is data presentation and analysis, while the conclusion and recommendation follow as section five.

2. Literature Review

2.1 Theoretical and empirical Framework

Purchasing Power Parity theory (PPP): PPP is a theory of exchange rate determination and a way to compare the average cost of goods and services between countries. PPP is a work generally attributed to Cassell's writing in the 1920s, although its intellectual origin dated back to the early writings of the 19th century British economist [11] cited in [9]. The PPP relationship becomes a theory of exchange rate determination by introducing assumptions about the behaviour of importers and exporters in response to changes in the relative costs of national market baskets. PPP is based on the Law of One Price (LOP), which states that identical goods should sell for the same price in two separate markets when there are no transportation costs and no differential taxes applied in the two markets [12].

Therefore PPP maintains its ground that in the long-run, identical products and services in different countries should cost the same. This is based on the principle that exchange rates will adjust to eliminate the arbitrage opportunity of buying cheaper goods or services in one country and selling it at increased prices in another, with the assumption of no tariffs, transportation costs, transaction costs and the existence of competitive markets for the goods and services in all countries [13] cited in [14]. PPP theory constitutes one of the fundamental building blocks in modeling the theories of exchange rate determination as it enjoys significance in exchange rate literature and has far reaching implications at the theoretical, empirical and policy levels.

[15], in their work 'exchange rate and microeconomic aggregate in Nigeria', investigated direct and indirect relationship between exchange rate and macroeconomic aggregates in Nigeria. They employed simultaneous equation and vector autoregressive models. The results show that there is no evidence of a strong direct relationship between changes in the exchange rate and Gross Domestic Product (GDP) growth. Although they concluded that Nigeria's economic growth has been directly affected by fiscal and monetary policies [1] examined the effect of exchange rate movement on economic growth in Nigeria. They specifically looked into the possible direct and indirect relationship between exchange rate and gross domestic product (GDP) growth; using a simultaneous equation and a Generalised Method Moments (GMM) technique, the found out that improvement in exchange rate management are necessary but not adequate to revive Nigerian economy. They recommended that broad programmes of economic reforms are required to implement exchange rate policy adopted in Nigeria.

[16] Investigated macro-economic fluctuations effect on the financial performance of listed manufacturing firms in Kenya. The study adopted explanatory survey research. Using multivariate regression tool, the study found that foreign exchange, interest rate and inflation rate have significant effect, most importantly that interest rate has an inverse effect on performance of firms in construction and manufacturing sectors.

[17] Investigated the relationship between exchange rate fluctuation and economic growth in Nigeria. He employed the Generalized Autoregressive Condition Heteroscedasticity (GARCH) technique to generate exchange volatility effect. The findings indicated that in a short run, economic growth is positively related to exchange rate volatility, while in a long run, a negative relationship exists between the dependent and independent variables.

[18] Conducted a research on the effect of exchange rate fluctuations on manufacturing sector in Nigeria. Using Ordinary Least Square (OLS), they found out that there is positive relationship between Manufacturing Foreign Private Investment, Manufacturing Employment Rate, and Exchange Rate with the dependent variable manufacturing gross domestic product (output). Among their recommendations, they said that government should restrict the importation of similar products manufactured in Nigeria to increase buying

of Nigerian products [19]. investigated the interactions between exchange rate and financial performance indicator in Nigeria Beer industry, covering years 2000 to 2013. They used Engle-Granger two step error correction model and found out that earnings per share has a short term negative and insignificant effect on exchange rate while price of equity shares, net asset value per share and price earnings ratio are positively and insignificantly related to foreign exchange rate in the short run.

[20] Empirically verified and discussed the impact of exchange rate fluctuations on manufacturing sector performance. He used quarterly data for the period of 1986 to 2012, and employed the use of GARCH technique. The result reveals that exchange rate is negatively related to manufacturing sector performance with the coefficient of 0.0659 and with the probability values of 0.0132. It also shows that inflation is positively related to manufacturing sector performance. He recommend that the government should properly manage exchange rate in Nigeria as it volatility has the potential to distort other factors which includes lending rate, labour force and price stability that matter for the performance of the manufacturing sector.

[21] Studied output, inflation and exchange rate in developing countries on application to Nigeria. They employed VAR model which captured the interaction between exchange rate outputs. The results from the contemporaneous model shoe a contractionary impact of the parallel exchange rate on the output but only in the short term. Also prices, parallel exchange rate and lending rate are important sources of perturbations in the official foreign exchange rate. Again they discovered that lending rate and prices accounted for a significant proportion of the variation in the parallel exchange rates. They then recommend that Central Bank of Nigeria (CBN) should formulate a stable and sustainable monetary policy stance, policies that stem the tide of inflationary pressure and policies that enhance income growth which are crucial for taming g the parallel exchange rate behaviour.

[22] Examined the determinant of exchange rate ion Nigeria from 1970 to 2007. They employed co-integration and error correction techniques and found out that improvement in productivity, investment Gross Domestic Product (GDP) ratio and high inflation rate lead to exchange rate appreciation, conversely, high degree of openness, increase in foreign exchange reserves and interest rate differentials lead to exchange rate depreciation. They recommend among others that both public and private sector should be increased, in order to raise production. Public investment should take the form of increased spending on infrastructural development, which would induce and encourage private sector investment through increased profitability, consequently leading to exchange rate appreciation.

The empirical work reviewed has shown that many studies have been conducted on exchange rate fluctuation in relation to economic performance or output (that is manufacturing Gross Domestic Product), other microeconomic variables and some sectors in the economy, but not much have been done on exchange rate impact on the financial performance of Food, Beverage and Tobacco manufacturing firms. This is the reason this study is chosen to fill the gap.

2.2 Operationalization of Variables

Dependent variable

	Indicators	Derivation
Financial performance	(i) Return on Assets	$\frac{\text{Net Profit}}{\text{Fixed Assets Working Capital}}$
	(ii) Return on Equity	$\frac{\text{Net Profit}}{\text{Share capital + Reserve}}$

Independent Variables

Exchange Rate	Exchange rate of N/$	Average annual exchange rate
Interest Rate	Annual interest rate	Average annual interest rate

3. Methodology

Because of the quantitative nature of this research, the researcher employed ex-post facto research design approach. The use of ex-post facto design is deemed appropriate because, it will enable the researcher to gain some determination, evaluation and explanation of past events, which are vital for better and more reliable prediction of the future outcomes. Then to bring out the changes, the independent variables are causing in the dependent variable. The population of the study is the fourteen Food, Beverage and Tobacco manufacturing firms listed on the Nigerian stock Exchange. We used purposive sampling technique to choose eight companies that have their financial information available for the chosen ten years. The data used for the study were secondary data, which were collected from the Central Bank of Nigeria (CBN) annual statistical bulletin and annual reports of the selected companies for the periods 2005 to 2014. Correlation and multiple regression analysis of the Ordinary Least Square (OLS) is the estimation technique that is employed in determining the effect that the exchange rate fluctuations have on the Food, Beverage and Tobacco firms' financial performance indicators highlighted.

3.1 Model specification

The model contains the dependent variable denoted by Y, which represents financial performance indicators, and the independent variables X_1, X_2 and X_3 which represent the exchange rate, interest rate and inflation rate respectively. Put mathematically we have;

FPI = f (ExchR, IntR, InfR)……equ. (1)

This equation (1) above is written in a stochastic form as expressed below;

$$Y = B_0 + B_1 X_1 + B_2 X_2 + B_3 X_3 + Er$$

Where

Y = FPI = (Earnings per Share-EPS, and Return on Equity-ROE).

X_1-X_3 = (Exchange Rate-EchR, Inflation Rate-InfR, and Interest Rate-IntR).

B_0 = the intercept for X variables in the regression model.
B_1, B_2, and B_3 = Coefficient of the independent variables.
Er = Error terms [23].
Specifically, when researcher converts the above general least squares model into our specified variables, it becomes:

$ROA = B_0 + B_1\ ExchR + B_2\ IntR + B_3\ InfR$----------equ (1)

$ROE = B_0 + B_1\ ExchR + B_2\ IntR + B_3\ InfR$----------equ (2)

4. Data Presentation and Analysis

Table 1: Return on Assets

YEARS	UNILEVER	DANGOTE	FLOUR MILL NIG	7-UP PLC	CADBURY PLC	UAC PLC	NASCON	NESTLE
2005	19.021	5.6138	11.011	13.264	12.73	11.212	-82.1	55.004
2006	-24.84	5.0109	8.4345	13.618	-84.19	16.608	-779.2	48.867
2007	14.156	1.3066	14.604	8.8212	-22.33	3.095	33.283	41.811
2008	26.782	7.2409	10.932	9.338	16.866	9.2446	29.731	46.118
2009	36.302	19.695	4.8952	7.5494	15.364	13.419	34.409	38.763
2010	36.227	12.108	21.361	7.2045	19.614	11.558	30.048	30.916
2011	41.288	2.5326	11.661	6.9623	18.556	3.1028	33.943	31.403
2012	39.517	-8.501	7.2049	8.9207	17.225	4.3264	37.83	33.139
2013	30.127	-23.89	6.3886	12.151	20.924	5.342	35.406	29.524
2014	16.793	-37.89	7.5496	24.753	10.236	4.3309	25.896	35.888

***Source*:** computed from annual reports of the companies

Table 2: Macroeconomic indicators

Year	Interest Rate	Inflation rate	Exchange Rate
2005	17.95	17.86	132.15
2006	17.26	8.22	128.65
2007	16.94	5.42	125.83
2008	15.14	11.58	118.57
2009	18.99	12.54	148.88
2010	17.59	13.72	150.30
2011	16.02	10.80	153.86
2012	16.79	12.20	157.50
2013	16.72	8.48	157.31
2014	16.55	8.12	158.55

***Source*:** CBN statistical Bulletin 2014

Table 3: Return on Equity

Years	Unilever	Dangote	Flour mill nig	7-UP PLC	Cadbury PLC	UAC PLC	Nascon	Nestle
2005	29.018	5.2233	19.521	21.644	21.28	12.699	47.133	88.676
2006	-40.91	5.1011	12.114	23.05	-189.1	18.341	37.862	88.992
2007	21.418	1.3253	21.873	19.416	-38.96	5.0493	36.69	87.259
2008	38.861	7.3586	19.701	22.275	26.5	10.742	33.731	92.253
2009	49.908	20.037	10.799	8.8781	25.682	15.874	39.778	92.789
2010	50.156	14.2	37.787	9.9344	24.552	13.499	34.654	84.775
2011	57.244	2.9984	24.001	12.117	22.126	3.9337	38.903	71.548
2012	55.734	-13.82	11.119	16.284	19.692	4.3264	42.057	61.831
2013	50.54	-39.86	9.6122	22.71	25.102	5.342	39.166	62.722
2014	32.256	-63.59	10.549	37.133	13.106	4.3309	29.601	80.425

***Source*:** computed from the annual reports of the companies

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.509[a]	.260	-.111	38.73520
a. Predictors: (Constant), Interest Rate, Exchnage Rate, Inflation Rate				

***Source*:** (SPSS version 21 output)

Table 5: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3154.968	3	1051.656	.701	.585[b]
	Residual	9002.496	6	1500.416		
	Total	12157.464	9			
a. Dependent Variable: RETURN ON ASSETS						
b. Predictors: (Constant), Interest Rate, Exchnage Rate, Inflation Rate						

***Source*:** (SPSS version 21 output)

Table 6: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.246	228.488		-.023	.982
	Exchnage Rate	.956	.862	.395	1.109	.310
	Inflation rate	3.655	3.906	.351	.936	.386
	Interest Rate	-9.843	13.235	-.283	-.744	.485
a. Dependent Variable: RETURN ON ASSETS						

***Source*:** (SPSS version 21 output)

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.649[a]	.422	.132	10.916500
a. Predictors: (Constant), Interest Rate, Exchange Rate, Inflation Rate				

Table 8: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.259	64.393		.221	.832
	Exchange Rate	.168	.243	.217	.690	.516
	Inflation Rate	2.190	1.101	.659	1.989	.094
	Interest Rate	-2.266	3.730	-.204	-.608	.566
a. Dependent Variable: Return on Equity						

From table 4, the coefficient of determination, (R^2) 0.26 implies that 26% of the changes in the return on assets of this sector can be explained by our model, while 74% of the changes in return on assets are due to factors outside our model. Table 5 shows that our model has a sig value > 0.05, thus is not statistically significant to changes in return on Assets. Notwithstanding the above, the independent variables have a strong correlation of 50.9% with the dependent variable as denoted by the regression coefficient (R = 0.509). The beta (standardized coefficient) in table 6 indicates that a unit increase in interest rate will cause 0.283 unit decrease in Return on Assets, again, a unit increase in inflation rate will induce 0.351 unit increase in Return on Assets and that return on assets increases by 0.395 in response by a unit increase in exchange rates. Therefore exchange rate and inflation rate have positive and insignificant effect on return on assets while interest rate has negative and insignificant effect on return on assets.

From table 7, the coefficient of determination (R^2) at 0.422 indicates the degree of causal relationship that exists between the predictor variable and the criterion variable (Return on Equity). It points out that 42.2% of the changes in Return on Equity are explained by changes in interest rate, inflation rate and exchange rate. In order words, 57.8% of the changes in return on equity could be explained by factors outside our model. A more conservative way of looking at this relationship is the adjusted coefficient of determination which shows an effect of 13.2% on the return on equity by our model. Table 8 shows that B of the standardized coefficient of exchange rate is 0.217, this indicates that a unit change in exchange rate induces 0.217 change in return on equity, and exchange rate in statistically significant at 0.516>0.05. Also, that return on equity changes by as much as 0.659 in response to a unit change in inflation rate. The result shows that inflation rate is not statistically significant at P (sig) 0.094 > 0.05. While a unit increase in interest rate swiftly causes -0.204 units decrease in return on equity. And interest rate is statistically insignificant by having a sig- value 0.566 > 0.05. The findings conform to that of [19] though they used price of equity shares, net asset value per share and price earnings ratio as different financial performance indicator, also it disagrees with the work of [21]. Thereby exchange rate and inflation rate have positive and no significant effect on return on equity, but interest rate has negative and insignificant effect on return on equity of manufacturing firms in Nigeria.

5. Conclusion and Recommendation

The study has empirically provided evidence that exchange rate has positive effect but not to a significant level on the financial performance of manufacturing companies in Nigeria. This is in conformity with real life situation as the increase in exchange rate, hiking the price of raw materials and production cost at large, where the selling price will proportionately be adjusted upwards to conform to the company's profit margin. Hence, the final consumers are the ones who bear the brunt that is occasioned by increased exchange rate. Pertinently, increase in interest rate will definitely lead to reduction in the financial performance as the finance servicing charges will be increased. The work of [16] is in agreement with the inverse relationship of interest rate and financial performance of manufacturing firms. Therefore, the following recommendations are made- Government should make a policy that should provide zero-based-interest-rate facilities to the manufacturers, as it is seen that any increase in interest rate could lead to above twenty percent decrease in the profitability indices sampled. Government should also implement policies that should ensure stable exchange rate as its burden is transferred to the citizenry (final consumers) thereby making life quite miserable for them. They should also ensure adequate provision of power as that would reduce significantly the overhead production cost incurred in buying diesel and fuel for power generation. Again, manufacturing companies should embrace technological development of the time which could also help them improve their profit by reducing production cost. Pertinently, something should be done to stimulate Nigerians to buy made in Nigeria goods, because even as the campaign against importation is going on, Nigerians do not hesitate to buy that foreign product that was smuggled in to the country despite its cost.

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