Foreign Exchange Rate Dynamics And Manufacturing Firms' Performance In Nigeria

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ABSTRACT: This paper studies the impact of exchange rate fluctuation on the performance of manufacturing firms in Nigeria using firms' profitability as a proxy for performance within the periods 1986 to 2016. The estimation technique adopted for the study was multiple regression method based on Ordinary Least Squares technique. However, in order to avoid the incidence of spurious estimates, evidence from the ADF test conducted revealed that the variables are integrated of order two, $1(1)$. The Johansen test conducted showed evidence of long run equilibrium relationship between Exchange rate fluctuation and the profitability of manufacturing firms in Nigeria Findings shows that there is a statistical significance between Exchange rate fluctuations on the profitability of manufacturing firms in Nigeria as shown by the joint variation of the T and F test and their respective P-values. It therefore recommends that Government should stimulate export diversification in the area of agriculture; agro-investment, and agro-allied industries, oil allied industries such that will improve Exchange rate fluctuations on improving basic amenities like electricity, transportation, water supply, telecommunication, human resource development, instead of implementing policies in an unhealthy economic and social structure.

Keywords: Exchange rate, Manufacturing, Nigeria, Profitability, Trade openness

I. Introduction

The erratic fluctuation in exchange rate is also referred to as exchange rate volatility could be described as a periods of domestic currency appreciation or depreciation. Ewa (2011), states that the exchange rate of the Naira was relatively stable between 1973 and 1979 during the oil boom era and when agricultural product accounted for more than 70% of the Nation's Gross Domestic Product (GDP). However, in 1986 when the Federal Government adopted the structural adjustment policy (SAP), the country moved from a rigid regime to a flexible exchange rate regime where exchange rate is left completely to be determined by market forces but rather the prevailiing system is the managed float whereby monetary authorities intervene periodically in the foreign exchange objectives (Mordi, 2006). This inconsistency in policies and lack of continuity in exchange rate policies aggravated the unstable nature of naira rate (Gbosi, 2005).

It should be noted that the goal of every economy is to have a stable rate of exchange with its trading partners, in Nigeria this goal was not reached irrespective of the fact that the country embarked on devaluation to promote exportation and stabilize the rate of exchange (Gbosi, 2005). Due to the inability of the country to realize this goal subjected the Nigeria manufacturing firms to the challenges of a constantly fluctuating exchange rate.

The manufacturing firm plays an important role in a modern economy and has a lot of benefits that are important for economic growth. In developed countries the manufacturing sector is a leading sector in many angles. In its quest to increasing productivity in relation to import substitution and export expansion, creating foreign exchange earnings capactity to promote the growth of investments on a faster rate than any other sector in the economy, raising employment opportunity, as well as wider and more efficient linkage among different sectors (Fakiyesi, 2005).

Inspite of the fact that the manufacturing sector is one of the fastest growing sector since 1973 (Obadan, 1994), the sector has become increasingly dependent on the external sources for import of non-labour input (Okigbo, 2008). The inability to import therefore can adversely affect the manufacturing firm negatively. Umubanwer (1995) has noted that there is an adverse consequence on this firm inability to import.

Financial statements especially the trading profit and loss account of a typical manufacturing company or group is normally characterized by large fraction of operating cost attributable to raw materials and power going by this fact, any company that predominantly engages its resources in manufacturing industries in Nigeria have the bulk of their raw material imported from foreign countries. This shows that at the moment, the devaluation of the Nigeria naira against the United States dollars; the argument is that fluctuations in exchange rate adversely affect output of the manufacturing firms.

This is because Nigerian manufacturing firms is highly dependent on import of inputs and capacity goods. These are paid for in foreign currencies whose rate of exchange is unstable. Thus, this apparent fluctuation is bound to adversely affect activities in the sector that is dependent on external sources for

productive input. This research is therefore carried out to determine the impact of exchange rate fluctuation on the performance of the manufacturing firms.

The fluctuation has hit the brewers in Africa largest economy, as latest earnings released showed these firms' profits fall due to the back spiraling cost of production. The latest earning release of three dominant brewers, (Nigerian Breweries Plc, Guinness Nigeria Plc, and International Breweries Plc) quoted on the floorr of the bourse, showed cumulative net income fell by 13.54 percent to N40.93 billion, from N47.36 billion in 2014.

Analyst attribute the decline at bottom line to a weak naria that significantly impacted on the cost of sales since most of the raw materials are imported to meet production. Therefore, brewers are spending more to produce each unit of products as cost of sales ratio increased to 51.13 percent in 2014 from 45 percent the previous year. From the above premise, this study was skewed to examine the impact of exchange rate fluctuation on the performance of manufacturing firms with focus on the bewing firms.

However, the broad objective of this paper is to investigate the impact of exchange rate dynamics on the performance of manufacturing firms in Nigeria. The specific objectives are to determine the extent real interest rate affects the profitability of manufacturing firms in Nigeria and examine the effect of trade openness on the profitability of manufacturing firms in Nigeria.

II.   Review Of Related Literature And Theoretical Framework

Exchange rate is the price of one country's currency in relation to another country. It is the required amount of units of a currency that can buy another amount of units of another currency. Aliyu (2011) asserted that appreciation of exchange rate results in increased imports and reduced export while depreciation would expand export and discourage import. Also, depreciation of exchange rate tends to cause a shift from foreign goods to domestic goods. Hence, it leads to diversion of income from importing countries to countries exporting through a shift in terms of trade, and this tends to have impact on the exporting and importing countries' economic growth.

In the same vein, Hossain (2002) agreed that exchange rate helps to connect the price systems of two different countries by making it possible for international trade and also effects on the volume of imports and exports, as well as country's balance of payments position. Rogoffs and Reinhartl (2004) also opined that developing countries are relatively better off in the choice of flexible exchange rate regimes.

Adebiyi and Dauda (2009) using error correction model argued on the contrary that trade liberalization promoted growth in the Nigerian industrial sector and stabilized the exchange rate market between 1970 and 2006. To them, there was a positive and significant relationship between index of industrial production and real export. A one percent rise in real export increase the index of industrial production by 12.2 percent. By implication, it means that the policy of deregulation impacted positively on export through exchange rate depreciation. Ubok-Udom (1999) examined the issues surrounding the implementation of SAP in Nigeria, and drew up a conclusion that the peculiar features of Nigerian economy reduced the efficacy of currency depreciation in producing desirable effects. From the study of the relationship between exchange rate variation and growth of the domestic output in Nigeria (1971-1995); he expressed growth of domestic output as a linear function of variations in the average nominal exchange rate. He further used dummy variables to capture the periods of currency depreciation. The empirical result showed that all coefficients of the major explanatory variables have negative signs. David, Umeh and Ameh (2010) also examined the effect of exchange rate fluctuations on Nigerian manufacturing industry. They employed multiple regression econometric tools which revealed a negative relationship between exchange rate volatility and manufacturing sector performance.

Barkoulas (2002) examined the impact of exchange rate fluctuation on the volume and variability of trade flows. They concluded that, exchange rate volatility discourages expansion of the volume of trade thereby reducing its benefits. Eichengreen and Lebland (2003) carried out their research in 12 countries over of 120 years and found strong inverse relationship between exchange rate stability and growth. They concluded that the results of such estimations strongly depends on the time period and the sample. Ogun (2006) studied on the impacts of real exchange rate on growth of non oil export in Nigeria highlighted the effects of real exchange rate misalignment and volatility on the growth of non-oil exports. He employed the standard trade theory model of determinants, of export growth and two entails deviation of the purchasing power parity (PPP), and the other which is model based estimation of equilibrium real exchange rate (ERER). He observed that irrespective of the alternative measures of misalignment employed, both real exchange misalignment and volatility adversely affected growth of Nigerian non-oil exports.

The monetary and traditional flow theory serves as the theoretical basis for this study. The monetary approach to exchange rate determination postulates that the relative supply of and demand for money between two countries is the basis for determination of exchange rate. It views increase in the supply of money as being able to generate inflation.

Hence resulting in exchange rate depreciation, the model opines that a situation of falling price with a given nominal money supply result in exchange rate depreciation, while the traditional flow model essentially

based on the principle of the interplay of demand and supply the force of the market interaction between demand and supply determines the rate of exchange. However when there is speculation or expectation of a change in the rate of exchange, this could lead to the disequilibrium even without any change in the initial determined factor.

Exchange rate can adversely affect the ability to import and therefore manufacturing output viz a vice profitability. Fluctuation in exchange rate will cause instability in purchasing power on manufacturing profitability and overall income level will also affect investment in import of input and invariably the exchange rate. This is because among the determining factors of rate of exchange rate are the demand for foreign exchange, the supply itself being influence by an economy's productivity level. Therefore the theory is considered relevant to the study because fluctuation in exchange rate will cause instability in purchasing power and hence negatively impacts on investment in other hands the effect on manufacturing profitability and overall income level will also affect investment in import of input and invariably the exchange rate.

III.   Methodology
3.1 Research Design and Model Specification
This study used the ex post Facto Research Design. This is because the study attempts to explore cause nature that affects relationships, where causes already exist and cannot be manipulated. The choice of model for this research is the Ordinary Least Squares because it provides satisfactory results for estimates of structural parameters. This method involves decision on whether the parameters are statistically significant and theoretically meaningful. It also verifies the validity of estimates and whether they actually represent economic theory. However, due to conventional reasons, we used E-view statistical package in the analysis for a reliable result.

The researcher used only the secondary source of data due to the nature of information. The data were generated from the publications by the Central Bank of Nigeria (CBN), the CBN statistical bulletin of various years, national bureau of statistics, CBN annual report and statement of accounts and other main stream publications of CBN.

In an attempt to examine the impact of Exchange rate on profitability a manufacturing firms in Nigeria (1986-2015), the research adopted multiple regression analysis in order to test the three objectives as stated above is stated below thusly;

MFP = F (EXR, INT, TOP)   ---*(1)*

$MFP_t = \alpha + \beta_1 EXR_t + \beta_2 INTR_t + \beta TOP_t + e$ ---*(2)*

Where: MFP = Manufacturing Firm Profit, EXR = Exchange Rate, INTR = Interest Rate, TOP = Trade Openness

Some econometric and statistical diagnostic tests were performed in order to ascertain the validity of the regression results. These tests include: Coefficient of multiple determination (R^2), T-Test and F-Test

IV.   Data presentation and results
4.1 Descriptive Statistics
4.1.1   Unit Root Test
The Augmented Dickey-Fuller (ADF) was employed to test for the existence of unit roots in the data using trend and intercept. The test results are presented in below:

Table 1: ADF Unit Root Result Test

Series	ADF @ level	ADF @ 1 Difference	5% Critical value	Order of cointegration	Remark
MFP	-2.065015	-5.363992	-3.587527	1(1)	Stationary
EXR	-1.985909	-4.899989	-3.587527	1(1)	Stationary
INT	-3.979648	-6.747564	-3.587527	1(1)	Stationary
TOP	-2.196919	-5.276321	-3.587527	1(1)	Stationary

Source: Researcher's Compilation from E-view (version 7.0)

Table 1 above shows the summary of unit root test results. The result shows that none of the variables; MFP, EXR, INT and TOP was stationary at levels using Augmented Dicey Fuller test. This is because their critical values were greater than ADF test statistics in absolute value at 5 percent level of significance. However, all the variables considered became stationary after first difference since their ADF test statistics were greater than their critical values in absolute value. The results show that the series are integrated of the same order; I (1) with the application of both ADF test. Therefore, the variables are fit to be used for the analystical purpose for which they were gathered.

4.2 Cointegration Test Result

Johansen co-integration test determines whether there exist long-term relationship occurs in variables or not. The test envisages that there can be just one relationship between variables in long term. In most cases, it two variables that are I (1) are linearly combined, the combination will also be I(1). More generally, if variables with differing orders of integration are combined, then the combination will have an order of integration equal to the largest. The model with lag 1 was chosen with the linear deterministic test assumption and the result is presented below.

Table 2: Cointegration Result Test
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob. **
None *	0.668198	43.95144	47.85613	0.1110
At most 1*	0.362656	14.16461	29.79707	0.8313
At most 2*	0.068995	2.002584	15.4971	0.9950
At most 3*	0.002675	0.072335	3.841466	0.7880

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
Sources: Researchers' Compilation from E-view (version 7.0)

Under the Johansen Co-integration test, Co-integration is said to exist if the values of computed Eigen values are significantly different from zero or if the trace statistics is greater than the critical value at 5 percent level of significance. The results of the co-integration in table 2 above indicated none the critical value at 5 percent level of significance in only of the hypothesized equations. Similarly, the computed Eigen value is significantly different from zero in one of the hypothesized equations. Hence, none of the hypothesized equations satisfies this condition and therefore the null hypothesis of no co-integration among the variables is accepted in at least all equation. Therefore there is no long run relationship between the variables used for the analysis in Nigeria within the period under study 1986-2014. In this study, mathematical relationships between the variables are established. Available data on Manufacturing Firm Profit (MFP), Exchange Rate (EXR), Interest Rate (INTR), and Trade Openness (TOP) were collected and used for the purpose of this analysis. Simple regression model is formed to capture th eassumed relationship between these variables.

Table 3. Regression Result Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.320060	0.600479	12.19037	0.0000
EXR	0.013976	0.003714	3.763270	0.0009
INT	-0.004937	0.032737	-0.150821	0.8813
TOP	0.052713	0.027794	1.896550	0.0695
R-squared	0.795918			
Adjusted R-squared	0.771429			
F-statistic	32.50002			
Prob (F-statistic)	0.000000			
Durbin-Watson stat	0.337083			

Source: Researcher's Compilation from E-view (version 7.0)

The value of the intercept which is 7.320060 shows that manufacturing firm profit in Nigeria will experience 7.320060 unit increases when all other variables are held constant. The coefficient of Exchange Rate (EXR) is 0.013976. This shows that Exchange Rate is positively related to manufacturing firm profit in Nigeria that a unit increases in Exchange rate is followed by an increase in manufacturing firm profit in Nigeria. The coefficient of Interest rate (INTR) is   -0.004937. This shows that interest rate is negatively related to manufacturing firm profit in nigeria, that a unit increase in (INTR) is followed by an decrease in Manufacturing firm profit in Nigeria.

Furthermore, the value of Trade Openness (TO) shows a positive relationship with Manufacturing firm profit in Nigeria with a value of 0.052713 this implies a unit increase in Manufacturing Firm Profit in Nigeria is been follwed by an increase in Trade Openness in Nigeria. The OLS result indicates that Exchange Rate fluctuation has a positive relationship with profitability of manufacturing firms in Nigeria again the p-value shows that the coefficient is statistical significant. Therefore, we reject the null hypothesis and conclude that Exchange Rate fluctuation has significant impact on the profitability of manufacturing firms in Nigeria within the year under-review.

Secondly, the OLS result indicates that Real Interest Rate has a negative relatinship with profitability of manufacturing firms in Nigeria again the p-value shows that the coefficient is Statistical insignificant. Therefore, we reject the null hypothesis and conclude Real Interest Rate has no significant impact on the profitability of manufacturing firms in Nigeria within the year under review.

Thirdly, the OLS result indicates that Trade Openness has a positive relationship with profitability of manufacturing firms in Nigeria again the p-value shows that the coefficient is statistical significant. Therefore, we reject the null hypothesis and conclude that Trade Openness has significant impact on the profitability of manufacturing firms in Nigeria within the year under-review.

f- test: If the f-calculated is greater than the f-tabulated (f-cal > f-tab) reject the null hypothesis (H0) that the overall estimate is not significant and conclude that he overall estimate is statistically significant. From the result, f-calculated (32.50002) is greater than the f-tabulated (2.91), that is, f-cal > f-tab. Hence we reject the null hypothesis (Ho) that the overall estimate has a good fit which implies that our independent variables are simultaneously significant.

Goodness of Fit Test (R^2): The (R^2) shows the amount of the variation in the dependent variables (GDP) that are explainable by the explanatory variable. The (R^2) which measures the overall goodness of fit of the entire regression shows the value of 0.7959 = 79.59% approximately 80%. This indicates that the independent variables accounts for about 80% of the variation in the dependent variable.

Durbin Watson Statistics: The computed DW is 0.3370, at 5% level of significance with three explanatory variables and observations, the tabulated DW for dI and du are 1.16 and 1.64 respectively. The value of DW is less than the lower limit. Therefore, we conclude the there is evidence of positive first order serial correlation.

V.   Conclusion

The study empirically verified the effect of exchange rate fluctuations on the manufacturing sector. This is against the backdrop of the fact that exchange rate is a crucial variable and the manufacturing sector is expected to be the moving force in the drive towards industrialization. It is observed that the fact that Nigeria is highly dependent on the external sector for import of inputs has made the effect of exchange rate devaluation worse especially in manufacturing because capacity to import was constrained by the depreciating currency leading to a corresponding decline in output. It is pertinent to note that the devaluation of exchange rate in association with factors such as technology and human skills are necessary for a country to be established in the export market which are lacking in the case of Nigeria. The country should therefore, embark on improving basic amenities like electricity, transportation, water supply, telecommunication, human resource development, instead of implementing policies in an unhealthy economic and social structure. Manufacturing activities should be encouraged by government by giving incentives and subsidies to local manufacturers and improving the technological and infrastructural development so as to increase the sector's contribution to Gross Domestic Product and employment.

Government should stimulate export diversification in the area of agriculture; agro-investment, and agro-allied industries, oil allied industries such will improve Exchange rate fluctuations on manufacturing sector in Nigeria Economy. The government should therefore, embark on improving basic amenities like electricity, transportation, water supply, telecommunication, human resource development, instead of implementing policies in an unhealthy economic and social structure. The government should encourage the made in Nigeria products by removing the exportation duties in order to increase exportation of Nigeria products.

References

[1].   Adebiyi, M. A and Dauda, R.O.S. (2009). Trade liberalization policy and industrualization growth performance in Nigeria: An error correction mechanism technique being a paper presented at the 45th annual conference of Nigeria economic society 24th to 26th August, central Bank of Nigeria new building auditorium, Abuja.

[2].   Aliyu, S. R. U. (2011). Impact of oil price shock and exchange rate volatility on economic growth in Nigeria. An empirical investigation, research. Journal of international studies.

[3].   Barkoulas, J.T, Baum c. and Calglyan, M. (2002). Exchange rate effect on the volume and variability of trade flows, journal on international money and finance No.21 pp. 481-406.

[4].   David, Umeh and Ameh (2010). The effect of exchange Rate fluctuation Nigeria manufacture sector. African journal of business. Management 4(14): 2994-2998

[5].   Eichengreen, B. and Lebhang, O (2003). Exchange rates and Cohesion: Historical perspective and Political-economy considerations, Journal of common market studies vol.41, pp 767-82.

[6].   Ewa, A. (2011) M Asher O. J (2012). The impact of exchange rate fluctuation on the Nigeria economic growth (1980-2010). CW published B.Sc this is of Caritas University Emene, Enugu State, Nigeria

[7].   Fakiyesi, O. A. (2005). Issues I money, finance and economci management lagos: University press.

[8].   Gbosi, A. N. (2005). Money, monetary policy and the economy. Port Harcourt.
[9].   Hossain, A. (2002), Exchange rate response to inflation in Bangladesh
[10].   Mordi, MC. (2006). Challenges of exchange rate volatility in economic management of Nigeria, in the dynamics of exchange rate in Nigeria, CBN Bullion volume 30 (3) july – September pp.17-25
[11].   Obadan M. I. (1994). Nigeria's exchange rate policy and management Ibadan: NCEMA publication.
[12].   Okigbo, P. (2008) Nigeria financial system: structure and growth, Ibadan: Longmans.
[13].   Ogun O. (2006). The Real exchange rate behaviour and Non-oil export Growth in Nigeria. African journal of economic policy, 4(1) june.
[14].   Ubok-udom, U. (1999). Currency depreciation and domestic output growth in Nigeria: the Nigeria. Journal of economic and social studies, 4(i). 31-44.
[15].   Umubauwer, (1995). Impact of SAP on Nigeria's industrial sector. The Nigeria economic and financial review 1(2).