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Effect of Exchange Rate Fluctuations on Manufacturing Sector in Nigeria

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Abstract

The title of this research paper is effects of exchange rate fluctuations on manufacturing sector in Nigeria. From current research, the issue of deciding on effective way to stabilize exchange rate of goods and services in manufacturing sector in Nigeria is one of the key elements of a firm's financial strategy. Therefore, proper care and attention need to be given while such decision is taken. Exchange rate of a country plays a key role in international economic transactions because no nation can remain in autarky due to varying factor endowment. The purpose of this paper is to know the effects of exchange rate fluctuations on manufacturing sector in Nigeria over a period of 25 years (1985 – 2010). This work employed four (4) variables such as manufacturing gross domestic product (MGDP), manufacturing foreign private investment (MFPI), manufacturing employment rate (MER) and Exchange rate (ER). The ex-post facto research design was used for this study. Manufacturing gross domestic product (MGDP) stands as dependent variable while manufacturing foreign private investment (MFPI), manufacturing employment rate (MER) and Exchange rate (ER) as independent variables. The secondary data were obtained from CBN Statistical Bulletin and Nigeria Bureau of Statistics. Descriptive statistics and multiple regressions were employed to find out the effects of exchange rate fluctuations on manufacturing sector in Nigeria. The results of the analysis showed that all the independent variables have significant and positive relationship with dependent variable with R^2 at 80%. It also indicates that manufacturing foreign private investment (MFPI) and Exchange rate (ER) have positive effect on manufacturing gross domestic product (MGDP). Based on the above findings, the researcher recommends that 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 restrict the importation of similar products manufactured in Nigeria to increase the buying of Nigerian products.

Keyword: Exchange rate, manufacturing employment rate, CBN Statistical Bulletin, Nigeria Bureau of statistics, manufacturing foreign private investment, Descriptive research, Regression, structural adjustment programmes and manufacturing gross domestic product.

1. Introduction

Effects of exchange rate fluctuations in developing countries like Nigeria has received considerable attention and generated much debate. The debate focuses on the degree of fluctuations in the exchange rate had generated internal and external shock in Nigerian Economy. Exchange rate of a country plays a key role in international economic transactions because no nation can remain in autarky due to varying factor endowment.

Oladipupo & Onotaniyohuwo (2011) states that movements in the exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, unemployment, money supply, etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services. The importance of exchange rate derives from the fact that it connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods. In other words, it links domestic prices with international prices. Opaluwa, et al (2010) opines that following the fluctuations of the naira in 1986, a policy induced by the structural adjustment programme (SAP), the subject of exchange rate fluctuation has become a topical issue in Nigeria. This is because it is the

goal of every economy to have a stable rate of exchange with its trading partners. In Nigeria, this goal was not reached in spite of the fact that the country embarked on devaluation to promote export and stabilize the rate of exchange. The failure to realize this goal subjected the Nigerian manufacturing sector to the challenge of a constantly fluctuating exchange rate. Exchange rate policies in developing countries are often sensitive and controversial, mainly because of the kind of structural transformation required, such as reducing imports or expanding non-oil exports, invariably imply a depreciation of the nominal exchange rate. Such domestic adjustments, due to their short-run impact on prices and demand, are perceived as damaging to the economy. Ironically, the distortions inherent in an overvalued exchange rate regime are hardly a subject of debate in developing economics that are dependent on imports for production and consumption (Dada & Oyeranti, 2012). It is an avenue for increasing productivity in relation to import substitution and export expansion, creating foreign exchange earning capacity, raising employment, promoting the growth of investment at a faster rate than any other sector of the economy, as well as wider and more efficient linkage among different sectors (Fakiyesi, 2005).

Despite various efforts by the government of Nigeria to maintain a stable exchange rate, the naira has continue to depreciate from N0.61 in 1981 to N2.02 in 1986, N7.901 in 1990, all against the one US dollar. The policy of guided or managed deregulation pegged the naira at N21.886 in 1994, N86.322 in 1999 and N135.50 in 2004. Thereafter, the exchange rate appreciated to N132.15 in 2005 and later N118.57 in 2008. Towards the end of the year, the naira depreciated to N150.0124 in 2009 and current in 2nd August, 2013 the exchange rate of one US dollar to naira is N160.14756 (or N160.15). Against this backdrop, this research paper seeks to examine effects of exchange rate fluctuations on manufacturing sector in Nigeria over a period of 25 years (1986 – 2010).

2. Objectives of the study

In a highly import dependent economy like Nigeria, the naira exchange rate has become one of the most widely discussed topic in the country today. This is not surprising as this topic has had a lot of impact on the Nigerian manufacturing sector. It is therefore, the objective of this study to evaluate the effects of exchange rate fluctuations on manufacturing sector in Nigeria.

These specific objectives are as follows:

- To investigate empirically, the effects of exchange rate fluctuations on Nigerian importation of input and capital goods.
- To determine if the continuous fluctuations of exchange rate of naira have any effect on the quality and quantity of output of manufacturing firms.
- To examine the effects of exchange rate fluctuations on Nigerian exportation of input and capital goods.

3. Research hypotheses

In order to address the objectives above, the following hypotheses shall be proved:

H1: Exchange rate fluctuations have no effect on the importation of input and capital goods.
H2: Exchange rate fluctuation has no significant effect on the quality and quantity of goods manufactured by Nigerian firms.
H3: Exchange rate fluctuations do not affect the exportation of made in Nigeria goods.

4. Scope and limitations of the study

This research work is designed to cover 25 years period from 1986-2010. The scope consists of the regulatory deregulatory exchange rate period i.e. the fixed exchange rate and floating rate period. The study is structured to evaluate Nigerian exchange rate as the pilot of economic growth and development. Thus, this study is therefore limited to effects of exchange rate fluctuations on manufacturing sector in Nigeria.

4. Theoretical Framework

Ettah, et. al (2012) studies effects of price and exchange rate fluctuations Agricultural exports in Nigeria. They observed that exchange rate fluctuations and Agricultural credits positively affect cocoa exports in Nigeria. They

also revealed that relative prices of cocoa are insignificantly related to quantity of export, however, it has a negative sign which is in line with a priori expectation. Also implies volatility on cocoa export in Nigeria.

Asher (2012) opines that exchange rate is used to determine the level of output growth of the country. However, with already existing exchange rate policies, a constant exchange rate has been uncertainty in the trade transaction. This has resulted to declines in standard of living of the population increase in costs of production which resulted in cost-push inflation. Owolabi & Adegbite (2012) examines the effects of foreign exchange regimes on industrial growth in Nigeria for the period of 21 years (1985 – 2005). This study found out that exchange rate has significant effects on the economics growth with the adjusted R^2 of 69%. Opaluwa, et. al (2010) states that coefficients of the variables carried both positive and negative signs. It also shows adverse effect and all statistically significant in the final analysis. Dada & Oyeranti (2012) observes that there is no evidence of a strong direct relationship between changes in the exchange rate and GDP growth. Rather, Nigeria's economic growth has been directly affected by fiscal and monetary policies and other economic variables particularly the growth of exports (Oil). These factors have tended to sustain a pattern of real exchange rate management are necessary but not adequate to revive the Nigerian economy. Azeez, et. al (2012) reveals that oil revenue and balance of payment exert negative effects while exchange rate volatility contributes positively to GDP in the long run. Oladipupo & Onotaniyohuwo (2011) in their view, exchange rate has a significant impact on the balance of payments position. The exchange rate depreciation can actually lead to improved balance of payments position if fiscal discipline is imposed. They also found out that improper allocation and misuse of domestic credit, fiscal indiscipline, and lack of appropriate expenditure control policies due to centralization of power in government are some of the causes of persistent balance of payments deficits in Nigeria. Ehinomen & Olodipo (2012) says that in Nigeria, exchange rate appreciation has a significant relationship with domestic output and it will promote growth in the manufacturing sector. It also ascertained that there is a positive relationship between the manufacturing gross domestic product and inflation.

5. Methodology

Since the purpose of this research paper is to gain a better insight into the exchange rate fluctuations on manufacturing sector in Nigeria and the effects of various independent variables on the dependent variables. Manufacturing Gross Domestic Product (MGDP) as dependent variable while manufacturing's Foreign Private Investment (MFPI), Manufacturing's Employment rate (MER) and Exchange rate (ER) as independent variables. Descriptive research and Ex-Post Facto research design were adopted to obtain necessary data for the study. The secondary data were also employed for this study i.e CBN Statistical Bulletin 2010 and Nigeria Bureau of Statistics.

6. Description of Variables

The choice of research variables was primarily guided by previous empirical studies along this, thus, the variables are consistent with Opaluwa, et. al (2010).

6.1. Manufacturing Gross Domestic Product (MGDP): The monetary value of all the manufacturing finished goods and services produced within a country's borders in a specific time period, though GDP is usually calculated on an annual basis. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory. GDP is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living. Critics of using GDP as an economic measure say the statistic does not take into account the underground economy - transactions that, for whatever reason, are not reported to the government. Others say that GDP is not intended to gauge material well-being, but serves as a measure of a nation's productivity, which is unrelated.

MGDP = C + G + I + NX
where:
"**C**" is equal to all private consumption, or consumer spending, in a nation's economy
"**G**" is the sum of government spending
"**I**" is the sum of all the country's businesses spending on capital
"**NX**" is the nation's total net exports, calculated as total exports minus total imports. (NX = Exports - Imports)

6.2. Manufacturing Foreign Private Investment (MFPI): An investment made by a company or entity based in one country, into a company or entity based in another country. Manufacturing foreign private investments differ substantially from indirect investments such as portfolio flows, wherein overseas institutions invest in equities listed on a nation's stock exchange. Entities making direct investments typically have a significant degree of influence and control over the company into which the investment is made.

6.3. Manufacturing Employment Rate: Manufacturing employment rates indicate the percentage of persons of working age who are employed. In the short term, these rates are sensitive to economic cycles, but in the longer term they are also affected by government policies that pertain to higher education, income support and measures that facilitate employment of women. Employment rates for men and women differ both between countries and within individual countries. Employment rates are here shown for total employment and for men and women separately. Employment rates are calculated as the ratio of the employed to the working age population. To calculate this employment rate, the population of working age is divided into two groups: those who are employed and those who are not. Employment is generally measured through household labour force surveys and, according to the ILO Guidelines, employed persons are defined as those aged 15 or over who report that they have worked in gainful employment for at least one hour in the previous week. Those not in employments consist of persons who are out of work but seeking employment, including students and all others who have excluded themselves from the labour force for various reasons, such as incapacity or the need to look after young children or elderly relatives. Working age is generally defined as persons in the 15 to 64 age bracket although in some countries working age is defined as 16 to 64.

6.4. Exchange Rate: The exchange rate as the product of the interaction between the demand for and supply of foreign exchange. The exchange rates adjust to balance the demand for foreign exchange depends on the demand domestic resident's have for domestic goods and assets. It is also the price of one currency in terms of another.

7. Model Specifications:

The researcher used regression and Ordinary Least Squares (OLS) for this paper. The choice of OLS is guided by the fact that its computational procedure is simple and the estimates obtained from this procedure has optimal properties which includes linearity, Unbiasedness, Minivariance and mean squared error estimation (Koutsoyianis, 2003).

In carrying out this paper work on effects of exchange rate fluctuations on manufacturing sector in Nigeria, we develop a compact form of our model as follows:

MGDP = f (MFPI, MER, ER)…….(1)

Where:

MGDP = Manufacturing's Gross Domestic Product (output);

MFPI = Manufacturing's Foreign Private Investment;

MER = Manufacturing's Employment Rate and

ER = Exchange Rate

$(MGDP)y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + Ci$

Where:

Y = Dependent variable.

X = Independent variable.

b_0 = Intercept for X variable.

$b_1 – b_3$ = Coefficient for the independent variables X, denoting the nature of effect with dependent variable Y (or parameters).

Єi = the error term.

Specifically, when researcher converts the above general least squares model into our specified variables, it becomes:

(MGDP) $y = b_0 + b_1(MFPI) + b_2(MER) + b_3(ER) + Є$

8. Findings

<Insert Table 1>

The descriptive statistics table above shows that over the period, the manufacturing's foreign private investment (MFPI), manufacturing's Employment rate (MER) and Exchange rate (ER) have positive mean value of 56019.9104, 5285.9076 and 828016.8 respectively while their standard deviation of the same variables are 23443.70864, 2777.88043 and 415039.48693 respectively. This indicates that any increase in mean values will result to an increase in the standard deviation values of the same variable and vice versa.

<Insert Table 2>

The above table indicates the relationship between the various independent variables and dependent variable used in the study. From this table, it is crystal clear that the relationships were found to be positive for all the independent variables with the dependent variable used in the study. This means that increase in any independent variable will also increase the dependent variable and vice versa. Their level of significance shows that all the independent variables for the study are statistically significant with dependent variable at 1%.

<Insert Table 3>

The table above shows the coefficient of multiple determinations (R^2) which explains the extent to which the independent variables affect the dependent variable. R^2 at 0.80 or 80% indicates a very strong relationship between the dependent and independent variables. In this case, 80% of the variations in the dependent variable are explained by the independent variables. The adjusted R^2 shows a more conservative way of looking at the coefficient of determination is also above 50% at 77.1%. So 80% of the changes in manufacturing's Gross Domestic Product (MGDP) are explained by changes in the manufacturing's foreign private investment (MFPI), manufacturing's Employment rate (MER) and Exchange rate (ER). Only 20% of the variations are determinate by other factors outside our model. Moreover, this table shows the results of correlation test i.e Durbin- Watson statistic placed at 0.660, F-value at 28.008 and degree of freedom at 24 (21, 3).

<Insert Table 4>

As shown in the table above, the t- calculated of manufacturing's foreign private investment (MFPI) is 0.742, this indicates that MFPI has a positive effect on manufacturing's Gross Domestic product. However, at significance level of 0.466 > 0.05, it is statistically insignificant. This result is strengthened by the fact that the t-calculated of MFPI is less than the critical value of t* 2. Thus, the weight of the evidence suggests that exchange rate fluctuations have no effect on the importation of input and capital goods in manufacturing sector in Nigeria. This means that a change in MFPI practically have no positive effect on exchange rate fluctuations in manufacturing sector in Nigeria. This is in consonance with the findings of Opaluwa, et. al (2010); Owolabi & Adegbite (2012); Asher (2012) and Ehinomen & Oladipo (2012).

Moreover, this table above shows that the t- calculated of manufacturing's Employment rate (MER) stands at 2.862 > t* 2 confirming that it is statistically significant to manufacturing Gross domestic product (MGDP). It also shows positive effect on MGDP of manufacturing sector in Nigeria. So any increase in manufacturing's Employment rate (MER) will result to an increase on the MGDP. Also, Azeez, et. al (2012); Ehinomen & Oladipo (2012) and Owolabi & Adegbite (2012) were in agreement with this findings.

Finally, the regression coefficient and significance level table shows that t- calculated of Exchange rate (ER) is 1.672. This indicates that ER has a positive effect on manufacturing Gross domestic product (MGDP) of manufacturing sector in Nigeria. The corresponding significance level of 0.109 points out that the t- calculated (ER) is statistically insignificant. Thus, the weight of the evidence suggests that exchange rate fluctuations have

no significant effect on the quality and quantity of goods manufactured by Nigerian firms. A decrease in exchange rate will bring a decrease in manufacturing gross domestic product by number of times the value of t-calculated of ER. So exchange rate appears not to be an important variable of MGDP of manufacturing sector in Nigeria. This result was found out to be insignificant and positive with dependent variable on Azeez, et. al (2012) and Ehinomen & Oladipo (2012).

MGDP = -12995.695 + 0.087MFPI + 3.49MER + 0.012ER + Ɛi

9. Recommendations

- The government should restrict the importation of similar products manufactured in Nigeria to increase the buying of Nigerian products.
- 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.
- The government should encourage foreign investors to invest in Nigeria to increase their gross domestic product in order to increase the standard of living of the citizen of the country.

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Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
MGDP	19984.8396	17381.38892	25
MFPI	56019.9104	23443.70864	25
MER	5285.9076	2777.88043	25
ER	828016.8000	415039.48693	25

Source: Author's SPSS Output.

Table 2: Correlations

		MGDP	MFPI	MER	ER
Pearson Correlation	MGDP	1.000	.742	.874	.809
	MFPI	.742	1.000	.780	.682
	MER	.874	.780	1.000	.807
	ER	.809	.682	.807	1.000
Sig. (1-tailed)	MGDP	.	.000	.000	.000
	MFPI	.000	.	.000	.000
	MER	.000	.000	.	.000
	ER	.000	.000	.000	.
N	MGDP	25	25	25	25
	MFPI	25	25	25	25
	MER	25	25	25	25
	ER	25	25	25	25

Source: Author's SPSS Output.

Table 3: Model Summary

Model	R	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.894[a]	.800	.771	8308.92588	.800	28.008	3	21	.000	.660

a. Predictors: (Constant), ER, MFPI, MER

b. Dependent Variable: MGDP

Table 4: Regression Coefficient and Significance Level

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-12995.695	4489.099		-2.895	.009
	MFPI	.087	.117	.117	.742	.466
	MER	3.490	1.219	.558	2.862	.009
	ER	.012	.007	.279	1.672	.109

a. Dependent Variable: MGDP