Effects of Foreign Exchange Crisis on the Performance of Manufacturing Sector in Nigeria

Abstract: The study examined the effect of foreign exchange crisis on the performance of manufacturing sector in Nigeria over the period of 35 years ranging from 1985 to 2019. The study proxy foreign exchange crisis by exchange rate of U.S to Nigeria, trade openness and foreign direct investment while performance of manufacturing sector was measured by manufacturing sector gross domestic product. Time series were used and sourced from central bank of Nigeria statistical bulletin for 2019. Ordinary least square (OLS) technique of regression was used to analyze the data. The R-square, T-statistics and F-statistics were used to determine the extents to which the explanatory variables affect the explained variable. The hypotheses formulated were tested at 5% level of significance using t-test. The results reveal that foreign exchange rate has a negative and significant effect on manufacturing sector GDP in Nigeria. Trade openness has a positive and significant effect on manufacturing sector performance while foreign direct investment has a positive and significant effect on manufacturing sector GDP in Nigeria. The study concluded that foreign exchange crisis plays a significant negative role in the performance of manufacturing sector in Nigeria. The study recommended that there should be pursuance of sustainable and stable exchange rate policy and to put in place, measures that will promote greater exchange rate stability.

Keywords: Foreign Exchange, Trade Openness, Foreign Direct Investment, Gross Domestic Product, Nigeria.

1. Introduction

Exchange rate policy has been a significant instrument for macroeconomic management in Nigeria as it has been frequently applied in the past to preserve the value of the naira, maintain a comfortable external reserves position and ensure price stability. In the past, different exchange rate policies have been used depending on the conditions of the economy at that period and sometimes in response to the changing exchange rate policies with the rest of the world. Often these policies are directed largely at efforts to restrict or ration the use of foreign exchange at officially determined rates, but recent policy shifts have reflected a move towards market-determined exchange rate (Agu, 2002). This is why Akpan and Atan (2012) assert that exchange rate policies in developing economies are often sensitive and controversial. This is mainly because of the kind of structural transformation needed, which means 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.

Back home in Nigeria, exchange rate policy has witnessed substantial transformations, from the era of fixed parity with the British pound, through the oil boom of the 1970s, to the floating of the currency in 1986. In each of these eras, the economic and political considerations underpinning the exchange rate policy had important repercussions for the structural evolution of the economy, inflation, the balance of payments and real income (Akpan and Atan, 2012). This summersault and inconsistency in policies and lack of continuity in exchange rate policies aggravated the unstable nature of naira rate (Gbosi, 2005). Hence no matter the type of exchange rate regime adopted by the country, it has an effect on business firm productivity in that particular country. Ugwu (2017) document that business firms operating in Nigeria depends heavily on foreign exchange to import raw materials, spare parts and other inputs for manufacturing and production purposes. The inability to import these input materials as a result of exchange crisis adversely affect the manufacturing firm negatively. With this development, many business firms in Nigeria are faced with high cost of production, low capacity utilization; high unit prices due to the constant fluctuation in value of foreign currency vis-à-vis the naira, inefficiency in the production process
and fierce competition from foreign competitors which finally edge them out of business among others (Nnamocha et al., 2017).

Furthermore, the foreign exchange rate influences trade by determining the relationship between international and domestic prices. However, changes in the real exchange rate result in the rising or lowering of the prices of Nigerian goods in local currency terms around the globe. A rise in naira raises the price of Nigerian goods on the international market, while a fall in naira lowers these prices. The volatility of foreign exchange rates makes the exportsIMPORT costslier or cheaper and also the unstable tendency of exchange rate attaches a level of uncertainty or risk to trade (Mary and Fagite, 2014). Moreover, the performance of manufacturing sector depends on the favorable international market couple with stable exchange rate in the international trade. Many scholars have reported that Nigerian exchange rate is highly volatile and vulnerable to the international shocks, owning to this fact, the country manufacturing sector which deals with production of oil and non-oil goods cannot be immune against these external shocks and volatility of the exchange rate (Mary and Fagite, 2014). In furtherance, Fapetu (2013) found that exchange rate volatility affects the performance of manufacturing sector as well as economic growth in Nigeria.

Thus, foreign exchange crisis is a major constraint in the development of manufacturing sector in Nigeria, making planning for the sector more problematic and investments more risky. For instance, if potential foreign investors to Nigeria are risk averse, larger foreign exchange rate volatility may reduce the overall foreign direct investment inflows since it increases uncertainty over the returns in a given investment. Potential investors will invest in a foreign location only if the expected returns are high enough to cover for the risk involved. Furthermore, for a developing country like Nigeria that is highly dependent on trade, the exchange rate, which is the price of foreign exchange, has implications for balance of payments viability and the level of external debt. For instance, if the foreign exchange rate is overvalued, then it would result to unsustainable balance of payments deficit, encourage capital flight and escalate external debt stock, which in turn will lead to declining level of investment and poor performance of manufacturing sector. Interestingly, several empirical studies have been carried out on the effect of foreign exchange rate on the economic growth in Nigeria. However, there are dearths of empirical works establishing the effect of foreign exchange crisis on performance of manufacturing sector in Nigeria. This creates a gap that this study intends to bridge.

2. Literature Review

Godwin and Idaraobong (2019) analyzed the relationship between exchange rate deregulation and manufacturing sector output in Nigeria. The study utilized annual time series data from 1986-2017 using Autoregressive Distributed Lag (ARDL) framework. The ARDL results indicated that exchange rates deregulation related negatively with the manufacturing output in Nigeria but its effect was significant only in the third period lag. The study further found that inflation rate related negatively with the productivity of the manufacturing sector at 10% significance level in the long run. It showed that increased labour employment increased productivity overtime and that gross capital formation has a significant relationship with manufacturing output while increased capacity utilization of the manufacturing sector improved its productivity. It is suggested that to improve the productivity of the manufacturing sector in order to grow the Nigerian economy, emphasis should be laid on export promoting policies, import substituting policies, capacity utilization building through human capacity development and effective exchange rate management policies.

Victoria (2019) employed Neo-Classical theory with financial intervention using Cobb Douglas growth model in assessing the impact of manufacturing productivity, exchange rate volatility on inclusive growth in Nigeria using the time series data from 1981 to 2015. The study investigated the long run agriculturally driven economic inclusive growth using Johansen Co-integration test and Normalized Co-integration. This study found out there is a long run relationship between these variables. While manufacturing sector exact more long run effect on per capita income.

Celina et al. (2018) examined the impact of exchange rate policy on manufacturing output, using evidence from Nigeria for the period 1981-2016. Johansen cointegration test and Vector Error Correction (VECM) model were applied in the analysis. Time series data obtained from the Central Bank of Nigeria (CBN) statistical bulletin on manufacturing output (MOP), exchange rate (EXR), manufacturing sector capacity utilization (MCU) and import (IMP) were engaged in the investigation. After the necessary integration, co-integration and correcting the error in the estimated equation, a causality analysis via Granger causality test among the relevant variables was undertaken in order to verify the relevance of the exchange rate-led hypothesis to manufacturing sector output growth in Nigeria. The results revealed that
growth increasing the quantity of naira exchanged for the dollar caused a fall in the manufacturing output in Nigeria. However, this impact was found to be insignificant. Thus, exchange rate volatility does have significant impact on the growth of manufacturing output in Nigeria. Hence, since exchange rate volatility was indicated to impact on manufacturing output in Nigeria significantly, the study recommends that the policy makers should vigorously pursue macroeconomic policies that will keep the exchange rate of the naira at a tolerably stable low rate.

Ugwu (2017) studied the impact of exchange rate fluctuation on manufacturing firms’ performance in Nigeria by employing profitability of firms as a proxy for manufacturing firms’ performance for the period 1986-2016 through the application of multiple regression analysis based on Ordinary Least Squares (OLS) technique. The study conducted stationarity test using Augmented Dickey-Fuller (ADF) test and the results indicated that the variables were integrated of order one. The results of Johansen cointegration test conducted revealed that long run relationship exists between exchange rate fluctuation and the profitability of manufacturing firms in Nigeria. The results also showed that significant relationship exists between exchange rate fluctuations and the profitability of manufacturing firms in Nigeria by applying joint variation of the T and F tests and their associated p-values.

Nwokoro (2017) investigated the influence of foreign exchange and interest rates variations on the manufacturing output in Nigeria from period 1983-2014 through the applications Ordinary Least Square (OLS), co-integration and its associated Error Correction Modeling. The variables employed in the study include manufacturing output, government expenditure on manufacturing sector, capacity utilization, foreign exchange rate, investment in industrial production and interest rate. The results showed that foreign exchange rate (FREX) and interest rates (INTR) have negative and significant influence on manufacturing Output (MANO).

Nnamocha et al. (2017) examined foreign exchange and industrial sector growth in Nigeria. Secondary data on industrial output, foreign exchange disbursement, foreign exchange rate and Nigeria foreign reserves 1981 -2015 were collected from the Central Bank of Nigeria Statistical Bulletin, 2015 edition. The E-view version 9 Econometric program was used to run a regression on the data collected. Foreign exchange availability (proxied by foreign exchange disbursement) was found to have no significant but positive influence on the Nigeria industrial sector growth. While foreign exchange rate and Nigeria foreign reserves were found to have positive and significant influence on the growth of Nigeria’s industrial sector. It is recommended that the Nigerian government should take urgent steps to tackle the foreign exchange crisis and maintain a sustainable exchange rate. The government should also ensure that foreign exchange available to importers of industrial inputs and at the same time grow the country’s foreign exchange reserves.

Lawal (2016) studied the impact of exchange rate fluctuations on manufacturing sector output in Nigeria for the period 1986-2014 using multiple regression analysis by applying Autoregressive Distribution Lag (ARDL) model. Data used in the investigation were obtained from the bulletin of the Central Bank of Nigeria (CBN) and World Development Indicators (WDI). The variables used in the study involve manufacturing output, government capital expenditure, Consumer Price Index and real effective exchange rate (EXC). The results of the ARDL revealed evidence of long run and short run relationships among the variables under consideration. The result also indicated that exchange rate has positive and significant effect on manufacturing sector output. More so, the results also showed that exchange rate has positive effect on manufacturing sector output. Thus, the study recommended that government should implement the policies on export strategies to encourage exports and discourage imports in order to achieve a favorable balance of payment.

Akin and Lawal (2015) examined the effect of exchange rate on the Nigerian industrial production for the period 1986-2010 using Vector Error Correction Model (VECM) approach. The results showed evidence of long run relationship among exchange rate, industrial production index, inflation rate and money supply. The results also indicated that exchange rate depreciation does not have significant effect on industrial production in the short run; however, in the long run, the results showed that exchange rate depreciation had significant impact on the industrial production in Nigeria. Lastly, it was also indicated in the estimation results that money supply affects industrial production significantly in the Nigerian economy.

Owolabi and Adegbite (2012) examined the effect of foreign exchange regimes on industrial growth in Nigeria. In line with the objectives of this study, secondary data were obtained from Central Bank of Nigeria Statistical Bulletin covering the period of 1985 to 2005. In concluding the analysis, multiple regressions were employed to analyze data on such variables as Gross Domestic Product, World Price Index, Per Capita Income, and Net Export. Exchange rate (broadly define, narrowly define and quasi money) were all found to have significant effects on the Economics Growth with the Adjusted R² of 69%.
Following the outcome of this study, it is therefore concluded that the effect of using Foreign exchange, World Price Index, Per Capita Income, and Net Export as an inducement for greater performance for stable economic growth and are capable of giving stability in prices for manufactured goods. Opaluwa et al. (2012) examined the influence of exchange rate fluctuations on manufacturing sector in Nigeria for the period 1986-2005 using multiple regression analysis. The variables employed in the study include manufacturing output, foreign direct investment and employment rate. The results indicated that all the independent variables have positive influence on the dependent variable.

3. Methodology

3.1. Data
The issue of data is of utmost importance to any research. Consequently, the nature of data for any research depends entirely on the objectives of the research and the type of research that is being undertaken. Consistent with this statement, secondary data (annual time series data) were used in this study. This study made use of time series data on foreign exchange rate, trade openness, foreign direct investment and manufacturing sector Gross Domestic Product. The sample for this study is 35 observations obtained from a time-series data spanning from 1985 to 2019. Availability of relevant required data was a justification for choosing the period. The relevant annual time series data will be obtained from Central bank of Nigeria (CBN) Statistical Bulletin of various issues.

3.2. Techniques for Data Analysis
The study employed the Ordinary Least Square (OLS) technique to estimate the regression model specified to determine the effect of foreign exchange crisis on performance of manufacturing sector in Nigeria. The choice of Ordinary Least Square (OLS) is mainly because it minimizes the error sum of squares and has a number of advantages such as unbiasedness, consistency and efficiency; it is widely used based on its property of BLUE (Best, Linear, Unbias, Estimate) which is simple and easy to understand. The E-view econometric software 9.0 will be used for data analysis. Also, the statistical test of parameter estimates will be conducted using t-test, F-test, and R-squared.

3.3. Model Specification
The model adopted for this study is multiple regression models. A log form of the multiple regression models was also adopted for this work. The choice of introducing log in the model is to enable us improve on the linearity of the model and also to avoid variance of errors over a sample. The model is stated below:

\[ MGDP = (FER, TON, FDI) \]  \hspace{1cm} (1)

The mathematical form of the model is expressed as:

\[ MGDP = \alpha_0 + \alpha_1 FER_t + \alpha_2 TON_t + \alpha_3 FDI_t \]  \hspace{1cm} (2)

The econometric form of the model is expressed as:

\[ MGDP = \beta_0 + \beta_1 FER_t + \beta_2 TON_t + \beta_3 FDI_t + \mu_t \]  \hspace{1cm} (3)

The econometric form of the model specified above is transformed to a logarithmic model as follows;

\[ \log MGDP = \alpha_0 + \alpha_1 \log FER_t + \alpha_2 \log TON_t + \alpha_3 \log FDI_t + \mu_t \]  \hspace{1cm} (4)

Where;
MGDP = Manufacturing Sector GDP
FER = Foreign Exchange Rate
TON = Trade Openness
FDI = Foreign Direct Investment
\[ \alpha_0 = \text{Regression intercept} \]
\[ \alpha_i = \text{coefficient or parameter attached to foreign exchange rate (FER)} \]
\[ \alpha_2 = \text{coefficient or parameter attached to trade openness (TON)} \]
\[ \alpha_3 = \text{coefficient or parameter attached to foreign direct investment (FDI)} \]
\[ t = \text{time} \]
\[ \log = \text{Logarithm/log linear} \]
\[ \mu_t = \text{Stochastic or error term which captures the effect of variables that are not included in the model}. \]
4. Results and Discussions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>420.9331</td>
<td>254.5049</td>
<td>1.653929</td>
<td>0.1082</td>
</tr>
<tr>
<td>FER</td>
<td>-8.196191</td>
<td>3.752909</td>
<td>-2.183956</td>
<td>0.0367</td>
</tr>
<tr>
<td>TON</td>
<td>0.866793</td>
<td>0.096702</td>
<td>8.963539</td>
<td>0.0000</td>
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<tr>
<td>FDI</td>
<td>0.872736</td>
<td>0.272642</td>
<td>3.201031</td>
<td>0.0032</td>
</tr>
</tbody>
</table>

R-squared: 0.953250
Mean dependent var: 3105.185
Adjusted R-squared: 0.948726
S.D. dependent var: 4172.580
S.E. of regression: 944.8299
Akaike info criterion: 16.64710
Sum squared resid: 27673812
Schwarz criterion: 16.82485
Log likelihood: -287.3242
Hannan-Quinn criter.: 16.70846
F-statistic: 210.7010
Durbin-Watson stat: 1.721206

The result in table 1 shows that there is a negative relationship between foreign exchange rate and manufacturing sector GDP. This is because the coefficient of foreign exchange rate is negative with -8.196191. This means that a unit increase in foreign exchange rate will lead to 8.196191 decreases in manufacturing sector GDP while a unit decrease in foreign exchange rate will lead to 8.196191 increases in manufacturing sector GDP. The follows of trade openness has a positive relationship with manufacturing sector GDP. This is because the coefficient of trade openness is positive with 0.866793. This means that a unit increase in trade openness will lead to 0.866793 increases in manufacturing sector GDP while a unit decrease in trade openness will lead to 0.866793 decreases in manufacturing sector GDP. Also, there is a positive relationship between foreign direct investment and manufacturing sector GDP. This is because the coefficient of foreign direct investment is positive with 0.872736. This means that a unit increase in foreign direct investment will lead to 0.872736 increases in manufacturing sector GDP while a unit decrease in foreign direct investment will lead to 0.872736 decreases in manufacturing sector GDP. The value of R-squared from the regression result in table 4.2 is 0.953250. The result of R-squared which is greater than 0.5(50%) and close to 1(100%) indicates that the regression line has goodness of fit. This also implies that about 95 per cent (95%) of the changes in manufacturing sector GDP is captured by foreign exchange rate, trade openness and foreign direct investment while the remaining 5 per cent (5%) of the variation in manufacturing sector GDP is captured by other variables outside the specified model.

<table>
<thead>
<tr>
<th>Variables</th>
<th>t-calculated Values</th>
<th>t-tabulated Values</th>
<th>DF</th>
<th>Decision Rule</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Exchange Rate</td>
<td>2.183956</td>
<td>2.037</td>
<td>31</td>
<td>Reject H0</td>
<td>Significant</td>
</tr>
<tr>
<td>Trade Openness</td>
<td>8.963539</td>
<td>2.037</td>
<td>31</td>
<td>Reject H0</td>
<td>Significant</td>
</tr>
<tr>
<td>Foreign Direct Investment</td>
<td>3.201031</td>
<td>2.037</td>
<td>31</td>
<td>Reject H0</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Source: Computation of the Researcher

Table 2 above shows the summary of the t-test carried out. A careful observation of the table revealed that foreign exchange rate, trade openness and foreign direct investment are individually statistically significant and therefore have individual significant effect on manufacturing sector GDP in Nigeria.

<table>
<thead>
<tr>
<th>Estimate</th>
<th>F-calculated Value</th>
<th>F-tabulated Value</th>
<th>DF</th>
<th>Decision</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression Model</td>
<td>210.7010</td>
<td>2.92</td>
<td>3.31</td>
<td>Reject H0</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Source: Computation of the Researcher
Table 3 above shows the summary of the t-test carried out. A careful observation of the table revealed that the estimated regression model is statistically significant. This also means that foreign exchange rate, trade openness and foreign direct investment have joint significant effect on manufacturing sector GDP. The implication of this is that the model is well specified and adequate for forecasting and policy recommendation.

4.1. Discussions of Finding

Empirical results of this study showed that foreign exchange rate is negatively related to manufacturing sector GDP. This means that increase in foreign exchange rate will lead to decrease in manufacturing sector GDP while decrease in foreign exchange rate will lead to increase in manufacturing sector GDP. Also, the first hypothesis tested stated that there is no significant relationship between foreign exchange rate and the performance of manufacturing sector in Nigeria. The null hypothesis one was tested at 5% level of significance. Following the decision rule, the null hypothesis one was rejected. This means that there is a negative and significant relationship between foreign exchange rate and the performance of manufacturing sector in Nigeria. This finding is consistent with the work of Lawal (2016) which stated that exchange rate has negative but significant effect on manufacturing sector output.

As regards the relationship between trade openness and manufacturing sector GDP, the results of this study showed that credit to trade openness is positively related to manufacturing sector GDP. This means that increase in trade openness will lead to increase in manufacturing sector GDP while decrease in trade openness will lead to decrease in manufacturing sector GDP. Also, the second hypothesis tested stated that there is no significant relationship between trade openness and the performance of manufacturing sector in Nigeria. The null hypothesis two was tested at 5% level of significance. Following the decision rule, the null hypothesis one was rejected. This means that there is a positive and significant relationship between trade openness and the performance of manufacturing sector in Nigeria. This finding is consistent with the work of Saibu (2014) which indicated that manufacturing sector output and openness were cointegrated for the Nigerian economy, thus there was a long-run relationship between them. Also, openness played an ambiguous role in contributing to manufacturing sector output. Countries with a well-developed financial market, benefit from openness while countries with a less developed financial market, lose more with increasing openness.

Lastly, as regards the relationship between foreign direct investment and manufacturing sector GDP, the results of this study showed that foreign direct investment is positively related to manufacturing sector GDP. This means that increase in foreign direct investment will lead to increase in manufacturing sector GDP while decrease in foreign direct investment will lead to decrease in manufacturing sector GDP. Also, the third hypothesis tested stated that there is no significant relationship between foreign direct investment and the performance of manufacturing sector in Nigeria. The null hypothesis three was tested at 5% level of significance. Following the decision rule, the null hypothesis one was rejected. This means that there is a positive and significant relationship between foreign direct investment and the performance of manufacturing sector in Nigeria. This finding is consistent with the work of Nwokoro (2017) which stated that that foreign direct investment positively and significantly influenced the manufacturing sector, capacity utilization, as well as investment in industrial production.

5. Conclusions and Recommendations

The study empirically examined the effect of foreign exchange crisis on performance of the manufacturing sector in Nigeria. The study found that foreign exchange crisis as proxied by foreign exchange rate is a significant determinant of performance of manufacturing sector in Nigeria. The study therefore concludes foreign exchange crisis plays a significant negative role in the performance of manufacturing sector in Nigeria. Thus, the contribution of foreign exchange crisis to the performance of manufacturing sector in Nigeria is significantly negative.

Based on the empirical findings, the following are recommended:

i Since the results provide evidence of a negative relationship between foreign exchange rate and manufacturing sector GDP, there should be pursuance of a sustainable and stable exchange rate policy and to put in place, measures that will promote greater exchange rate stability.

ii Since there is a positive and significant relationship between trade openness and manufacturing sector GDP, there should be pursuance of effective policy that will improve terms of trade conditions, promote greater openness of the economy in order to improve the GDP of manufacturing sector and enhance non-oil exports.
Since foreign direct investment has a positive and significant effect on manufacturing sector GDP, government and the monetary authorities should design policies and programs that will encourage investors to invest in Nigeria. The problem of insecurity in the country should be addressed squarely by the government.

Manufacturing sector should be encouraged by the government through policy packages such as tax holiday and other helpful concessions in order to enhance manufacturing output in the country.

Government should be very cautious while devaluing the nation’s currency to avoid retaliatory effects, and also maintain stability in the exchange rate. Changes in exchange rate management strategy should be allowed to run a reasonable course of time.

The policy makers should vigorously pursue macroeconomic policies that will keep the exchange rate of the naira at a tolerably stable low rate. This would therefore, help in making Nigerian market more attractive to foreign investors; thus, improve the output growth of the manufacturing sector of the economy.

Government should stimulate export diversification in the area of agriculture; agro-investment, and agro-allied industries, oil allied industries such will improve Foreign Exchange Earnings.

References