| RESEARCH ARTICLE

A Determination Of The Influence Of Exchange Rate Movement On Manufacturing Production In Nigeria

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| ABSTRACT

The study examines the impact of exchange rate movement on manufacturing production in Nigeria. This study is necessitated by declining output in the sector over the years, which has led to poor economic performance in Nigeria despite persistent efforts by the government to make and implement exchange rate policies to promote manufacturing production and economic growth in the country. A simple regression analysis was carried out in this study in line with the simple regression (model) equations designed for the study. Secondary data were collated on exchange rate and manufacturing output in Nigeria for a period of 34 years (1986 – 2020). Exchange rate movement shows significant relationship in the study. Similarly, in line with the apriori expectations, the results displayed positive relationship i.e. between exchange rate movement and manufacturing production with adjusted coefficients of determination (R^2) values of 0.68351. This implies that 68% of the variation in manufacturing in the country is accounted for by exchange rate movement. In line with the findings of the study, it was recommended that the government should make and implement policies to: stabilize and support the value of the naira, diversify the economy to attract more foreign exchange earnings, discourage the importation of unnecessary and conspicuous goods, improve social service deliver, promotion exports and substitute imports, among others to reduce pressure on the Naira and promote the flow of foreign exchange into the economy.

| KEYWORDS

Exchange Rate Movement, Impact, Manufacturing Production, Nigeria

Introduction

Nigeria as a developing country relies heavily on the importation of heavy machineries, spare parts, high level man power and to some extent raw material inputs for operations, and to promote the advancement and growth of its manufacturing production. The role play by foreign exchange in meeting this demand cannot be overemphasized. Therefore, the availability of foreign exchange goes a long way in determining the performance of the manufacturing sector of the economy. And, as a result, the fluctuation in exchange rate would likely cause instability and poor performance of the sector and the overall economy (Abu and Nwaeke, 2021).

Macroeconomics variables interplay to determine the exchange rate equilibrium in the long run. Therefore, long term exchange rate equilibrium would reflect a long term economic stability in which the manufacturing sector plays a significant role. Exchange rate stability therefore would not only lead to a stable and strong manufacturing sector but would also lead to a strong economic performance as players in the economy would be able to make accurate long term plans and predictions against the future.

According to Umeora (2020), an exchange rate is a price just exactly like any other price which is the amount you give up to acquire something else. In this case, you give up an amount of money, say the naira to acquire another currency say, the United States dollar. Afolabi (2018), defines exchange rate as the rate at which one currency is exchange for another. In an economy that is highly import dependent like the Nigerian economy, exchange rate is so important that it determines all other prices including manufacturing and industrial outputs with significant impact on economic growth.

Various exchange rate policies have been introduced by successive governments in Nigeria since 1960. The broad objectives of the Nigeria foreign exchange policies were analyzed by Obadan (2016) as follows:

a. The mobilization of foreign exchange receipts;
b. Exchange rate stability;
c. Diversification and enhancement of external reverses to achieve reserve and optimum deployment of resources;
d. A viable and favorable external balance;
e. The reduction of documentation requirement in the spirit of liberalization;

These policies are aimed at improving the performance of the economy and manufacturing sector among others. Similarly, most of the economic policies adopted over the years were aimed at growing manufacturing production and the overall economy by making made in Nigeria products compete with products from other countries (Obadan, 2016). Among these policies were the exchange rate policies initiated over the years to liberalize activities in the foreign exchange market, aimed at impacting positively on the manufacturing sector and the entire economy. And, the performance of the manufacturing sector has a close relationship with the foreign exchange regimes in operation. As it stands today, the Nigerian manufacturing sector is still at its infant stage as capacity utilization and output in the sector remains abysmally low despite the various exchange rate regimes adopted by the government over the years to promote the growth of the sector. This study therefore intends to examine the role exchange rate movements play in the nation's manufacturing production.

Literature Review

Theories of Exchange Rate
The theories of exchange rate determination are: Purchasing Power Parity (PPP), which links spot exchange rates to nations' price levels. The Interest Rate Parity (IRP), which links spot exchange rates, forward exchange rates and nominal interest rates. This study is however anchored on the purchasing power parity theory.

The Purchasing Power Parity Theory
The purchasing power parity theory was propounded by Professor Gustav Cassel of Sweden. According to this theory, rate of exchange between two countries depends upon the relative purchasing power of their respective currencies. Such will be the rate which equates the two purchasing powers. For example, if a certain assortment of goods can be had for £1 in Britain and a similar assortment with #800 in Nigeria, then it is clear that the purchasing power of £ 1 in Britain is equal to the purchasing power of #800 in Nigeria. Thus, the rate of exchange, according to purchasing power parity theory, will be £1 = #800.

However, the purchasing power parity theory has been subjected to some criticisms. The actual rates of exchange between the two countries very seldom reflect the relative purchasing powers of the two currencies. This may be due to the fact that governments have either controlled prices or controlled exchange rates or imposed restrictions on import and export of goods (Keynes, 1940). Moreover, the theory is true if the purchasing power of the respective currencies in terms of goods which enter into international trade and not the purchasing power of goods in general. But it is well known that all articles produced in a country do not figure in international trade. Therefore, the rate of exchange cannot reflect the purchasing power of goods in general.

The Meaning of Exchange Rate

Exchange rates are prices at which currencies trade for each other. Ayodele (2016) described exchange rate as simply the value of foreign currency expressed in terms of domestic or other currencies which can be expressed either in nominal or real terms.

Two types of foreign exchange exist, they are:

1. Nominal Exchange Rate: This can be viewed from two angles; domestic currency terms and foreign currency terms. Dernburg (1989) defines nominal exchange rate from the domestic current term as the units of domestic currency per unit of foreign currency and from foreign current term as the units of foreign currency per unit of domestic currency. Here nominal exchange rate measures the relative price of two or more monies.

2. Real Exchange Rate: The real exchange rate measures the relative price of two goods. According to Ayodele (2016), real exchange rate can be defined from two perspectives: external and internal perspectives. The external perspective according to him is the nominal exchange rate adjusted from price level difference between countries, while internal perspective is the ratio of the domestic price of tradable to non tradable items as opposed to non tradable goods within a single country. The main objective of this is to capture the internal nature of price incentive in a particular economy for producing or consuming tradable as opposed to non – tradable goods.

    Sanusi (2004), however further desegregated Real Exchange Rate into bilateral, multilateral and effective real exchange rate. The bilateral real exchange comprises of the price of a representative consumption or production basket in the home country with similar representatives price in a foreign country measured in the same currency. Multilateral real exchange rate on the other hand is a weighted average to the external real exchange rate index with respect to using multiple trading partners while the term "effective" in the real exchange rate connotes two meanings: weightier average which is synonymous to multilateral real exchange rate and secondly, the incorporation of all forms of taxes charged on import and exports.

Exchange Rate Equilibrium

Demburg (1989) defines equilibrium of the exchange rate as the real effective exchange rate compatible with simultaneous achievement of internal and external balance in the medium terms. By internal balance he refers to the highest level of economic activity that is consistent with a desirably controlled level of inflation, based on the existing factor endowments including technology. The concept of external balance refers to determining the level of current account deficit that is consistent with development objective ensuring sustainable medium term target for the current account. This also connotes improvement of balance of payments positions and maintenance of a level of reserve consistent with macroeconomic stability. In exchange rate equilibrium, the supply and demand of foreign exchange are equal.

The Nigerian Exchange Rate Policies

The main objectives of Exchange Rate Policy in Nigeria according to Obadan (2016) are:

a. To preserve the value of the domestic currency
b. Elimination of payment arrears
c. To maintain a favorable external reserve position
d. Reduction of depended on imports and oil export
e. Stabilization of exchange rate and price level which are consistent with those of our trading partners.

     f.   To have a realistic exchange rate which will remove the existing distortion and disequilibrium in the external sector of the economy

     g.   To encourage local production of raw materials inputs

     h.   Attract foreign investment into the local economy

     i.   Encourage exports

     j.   Attain a high level employment

     k.   Improve the level of productivity

     l.   Improve balance of payment position and purchasing power in the economy.

Exchange Rate Policy plays an important role in National economic development. If well managed, it could facilitate the achievement of broad based macro economics objectives. Exchange rate policy in Nigeria has undergone substantial transformation since the post independence era when the country operated a fixed exchange rate system up to the early 1970s to 1986 when a market base exchange rate system was introduced in the context of the structural adjustment psrogramme. According to Ogbokor (2019), various exchange rate policies have been adopted by Nigeria since independence among which are the parity with the pound sterling (1960 – 1967), the gold content approach (1967 – 1971), pegging against a basket of currencies (1974 –1978), the import weighted basket approach (1978), the currency intervention system of 1984, the crawling peg system of 1984 – 1986, second tier foreign exchange market (1986), the interbank foreign exchange (IFEM 1989 – 1990), the dutch auction system (DAS) 1990 to the single rate system of 1999 (inter – bank foreign exchange), the dutch auction system (2002), the wholesale dutch auction system (2006), to the managed float exchange system which persists till date.

This regime was adopted following the dwindling foreign exchange earnings of the country. Here a combination of fiscal and monetary policy measures are adopted by the CBN toward a stable exchange rate for the economy. As at 2013, many countries had adopted this form of exchange rate regime in order to safeguard their currencies from increased volatility in foreign exchange market. The managed float system is in between the floating and the fixed system.

The Manufacturing Sector

The manufacturing sub-sector has been referred to as the hub of the industrial sector as it involves the use of machinery (Onoh, 2012). The Manufacturing sector goods can be applicable to food, biological, chemical, machinery, transportation, communication etc. products.

Manufacturing can be classified in the small, medium and large scales. It has been persistently stressed that for Nigeria economy to move   forward, the small and medium scale aspect of the manufacturing sector should be encouraged. Ayodele (2016) and Okeke (1997) argued that the generation of employment opportunities in Nigeria and boosting of production activities lie in the growth of the small and medium scale enterprises. They however went ahead to state that the large manufacturing concerns like Patterson Zucchinis (P.Z) are equally relevant as they too contribute to the growth of the economy via the GDP, foreign exchange earnings, employment generation etc. but insisted that the SMIS are the engine of growth of every economy. This is equally the view of Albert (2021) when he opined that economic growth in the United States is depended on the ability of small and medium scale industries to strive.

The Manufacturing sector is the back bone of every economy. Todaro and Smith (2016), argued that any economy without a strong and reliable manufacturing sector to back it up cannot be said to be industrialized. The development economists are of the view that for developing counties to break away from the various circle of poverty, a lot of resource has to be mobilized and put into the industrial sector to grow it as their continuous dependence on primary products as a means of sustenance would get them to nowhere in particular but rather would remain in the vicious circle of poverty.

     The establishment of a solid manufacturing base in a developing economy like Nigeria cannot be over emphasized. The advantages to be reaped from such establishment according to Essien (2017) are as follows:

          ❖   Effective utilization of indigenous natural resources

❖ Creation of satellite upstream and downstream industries for supply of raw materials input and intermediate products, machinery, equipment and spare parts maintenance, engineering and technical support services.

❖ Generation of high level employment and creation of facilities for high – level – man power development for the sector and other related sectors.

❖ Diversification of the source of income as well as increasing the foreign exchange earnings of the country.

❖ Promotion of the development of industries generally through effective supply of steel and related products to players within the sector and other sectors, particularly the oil sector thereby conserving foreign exchange for the country.

❖ A reliable policy of import substitution and export promotion could be pursued.

Empirical Literature

Morley (2012), analyzes the facet of real exchange rates on manufacturing output in twenty eight developing countries that have devalued their currencies using a regression framework. After the introduction of control for factors that could simultaneously induce devaluation and reduce output including terms of trade, import growth, the money supply and the fiscal balance, he discovered that depreciation of the level of the real exchange rate reduced production output.

Kamin and Klau (2018), using an error correction technique estimated a regression equation linking manufacturing to the real exchange rate for a group of twenty seven countries. They did not find that devaluations were contractionary in the long term. Additionally, through the control of the sources of spurious correlation, reverse causality appeared to alternate the measured contractionary effect of devaluation in the short term although the effect persisted even after the introduction of controls. Apart from the findings from simulation and regression analyses, results from VAR models, though not focused mainly on the effect of the exchange rate on the output per se, are equally informative.

It is important to mention the work of Odunsola and Akinlo (2020), who examined the linkage among exchange rate, inflation and manufacturing output in Nigeria. A structural VAR model was employed which captured the interaction between exchange rate and manufacturing production. Evidence from the contemporaneous models showed a contractionary impact of the parallel exchange rate on manufacturing output only in short term.

Oladipo and Adegbite (2012), examined the impact of exchange rate movement on the growth of the manufacturing sector in Nigeria. Ordinary least square (OLS) multiple regression analysis was employed. The study covered the periods of 1986 – 2010 with the use of time series data. The results did show that depreciation which forms part of the structural adjustment policy (SAP) 1986, and which dominated the period under review, has no significant relationship with manufacturing sector productivity. He also found out that appreciation as a significant relationship with domestic output and exchange rate appreciation will promote growth in the manufacturing sector performance in Nigeria for the periods 1986 – 2010.

Research Methodology
Research Design
Research could be conducted on an identified research problem. However, in conducting this research work, the historical research method is used. Historical research interprets past trends of attitude, events and facts. The data used is viewed with historical perspective as part of the process of social development rather than in isolated attitude, event or fact. It is intended to gain a clearer perspective of the present situation of current problems, but also with a greater appreciation of the role which new knowledge can play in the progress of society and interpret the data collected in order to link the past, present and the future trend of exchange rate variation in Nigeria and the effect on industrial output.

Analytical Procedure
Econometrics analysis would be applied and shall involve the following processes.

1. Specification of the model
2. Model estimation
3. Evaluation of the estimates
4. Evolution of the forecasting power of the estimated model.

Data Collection Method

Time series or secondary data were solicited for the purpose of this study. Data were sought on exchange rate and manufacturing from 1986-2020 through CBN publications, National Bureau of statistics, Ministry of finance etc.

Research Model and Measurement of Variables.

The specification of the models for this study will be as follows:

Functional Equation

MP = f (Ex)......................... (1)

Regression Equation:

$MP = b_0 + b_1 Ex + u$................ (2)

Apriori expectation for both equations:

$b_0 > 0 b_1 > 0$

Where:

MP = Manufacturing Production

Ex = Exchange Rate

b_0 = Constant

bi = Co- efficient

U = Stochastic term

Data Analysis Technique

A simple regression equation used in this study was applicable to determine the relationship that exists between exchange rate movement and manufacturing production. The classical least square (CLS) method was used to analyse the data and investigate the impact of exchange rate variation on manufcturing output. Regression models were adopted to determine the precise effect of exchange rate variation on manufacturing output in Nigeria. Also, the Co-efficient of determination (R^2), t – statistic and f- statistic tests were used to determine the explanatory power of the independent variables, significant of the estimated parameters in the regression models and the entire models.

Data Analysis And Discussion Of Findings

Analysis of Regression Statistics

The table 4.1 below shows a summary of regression statistics on manufacturing output and exchange rate movement.

Table 4.1: Summary of Regression Statistics, Manufacturing Output Versus Exchange Rate Movement.

Variable / Constant	Estimated coefficients	Standard errors	t-statistic
Constant	158.4873	459.5081	0.837
Exchange Rate	183.5933	26.7133	6.873
Adjusted R^2	0.68351		
F-ratio	47.234		

Source: Regression Analysis

The mathematical equation is as: $MP = b_0 + b_1 Ex$

The information supplied in table 4.1 above can be fitted into the above mathematical equation. Thus:

MP	=		158.4873 + 183.5933Ex
t_{cal}	=		(-0.837) (6.873)
S_E	=		(459.5081) (26.7133)

The adjusted coefficient of determination (R^2) is 0.68351 indicating that the independent variable (exchange rate) explains about 68 percent of the variation in the dependent variable (manufacturing output) while the rest is explained by stochastic errors.

The study found that exchange rate has a t-value of 6.873 and therefore related significantly with industrial output because the t_{cal} is greater that the t_{tab} value of 2.036 ($t_{cal} > t_{tab}$) under a two tailed test, carried out using the t-table at a degree of freedom of 32 at 0.05 significance level.

The intercept however, appeared not to be significant in this study as tests carried out on the intercept following similar procedure shows that the t_{cal} value of 0.837 is lower than the t_{tab} value of 2.036.

The F ratio is statistically significant at 47.234 as the F_{cal} value is greater than the F-table value of 4.15. This implies that the overall data used in the regression analysis and the entire regression analysis is reliable, and therefore the above equation provides a good fit for the data.

The Exchange Rate Coefficient

The exchange rate coefficient is positive with a magnitude of 183.5933 which shows a positive relationship between exchange rate and manufacturing output. This further confirms the apriori expectation of the study and implies that exchange rate appreciation would impact positively on manufacturing output.

The Intercept Coefficient

The intercept coefficient is positive with a magnitude of 158.4873. This
Implies that there is a positive relationship between the intercept and industrial output. This is in line with the apriori expectation of the study.

Analysis of Statement Errors

The exchange rate has a standard error magnitude of 26.7133 while that of the intercept is 459.5081. This implies that the standard error of exchange rate is lower than that of the intercept. The implication of this development is that exchange rate is more reliable in predicting the behavior of manufacturing production with little error than the intercept.

Discussion of Findings

The results shows that exchange rate movement has a positive relationship with manufacturing production, which implies that an appreciation of the value of naira against the United States Dollar would generate a positive impact on the manufacturing sector. This would make it easier and cheaper to bring in machineries, spare parts and raw material inputs for industrial use from other countries, which would consequently boost industrial output in the economy. The result of the agrees with that of of Kamin and Klau (2018), on linking manufacturing production to the real exchange rate for a group of twenty seven countries.

Also, the study of Odunsola and Akinlo (2020), which examined the linkage among exchange rate and manufacturing output in Nigeria is also in tandem with the result of the study. However, the outcome of the study of Oladipo and Adegbite (2012), which examined the impact of exchange rate movement on the growth of the manufacturing sector in Nigeria did not agree with the result of the study the results did show that depreciation which forms part of the structural adjustment policy (SAP) 1986, and which dominated the period under review, has no significant relationship with manufacturing sector productivity.

Conclusion

The Independent Variable (Exchange Rate) explained about 68% of the behavior of manufacturing production. This implies that the reminders of 32% of manufacturing production variation is accounted for by stochastic errors. Also, the study demonstrates the essence of having a currency that is strong in the foreign exchange market.

Recommendations

The following recommendations are made in line with the results of the study.

1. The government should make and implement policies that are aimed at stabilizing the value of the Naira. The Naira should be supported through drawings from the nation's foreign reserve into the foreign exchange market. This would help to stabilize the value of the Naira and make importation of Industrial raw materials, machineries and spare parts easier and cheaper.

2. Secondly, the government should as a matter of urgency consider the diversification of the Nigerian economy. The economy should be diversified away from a single revenue source (oil) to a multiple source that would bring in more foreign exchange into the economy to strengthen the value of the domestic currency.

3. The government should check mate the unnecessary importation of goods and services that are not relevant to the growth and development of the Nigerian economy. Such imports should be outrightly banned in order to conserve foreign exchange for the country and reduce pressure on the domestic currency.

4. Similarly, the infrastructure base of the economy should be over hauled and revitalized. This would reduce the cost of manufacturing production in Nigeria and increase domestic and foreign investments in the economy. This would help increase the revenue generating capacity of the economy as made in Nigeria goods would be cheaper in the international market which would further reduce pressure on the Naira.

5. Export promotion strategies and policies should also be overhauled. Agricultural produce such as cocoa, palm kernel, cotton etc should be processed before export for the purpose of value addition.

6. Finally, the government should consider as a matter of urgency the encouragement of investments into the downstream of the petroleum sector by encouraging the building of more refineries and fixing the existing ones to discourage importation of refined petroleum products into the economy. This would help the nation conserve much needed foreign exchange and reduce pressure on the naira. A similar gesture should be extended to the steel sector so that priority can be given to the completion of Ajaokuta steel complex, that would consequently lead to a reduction in steel imports and reduce pressure on the naira.

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