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# The Contributions of Exchange Rate on the Growth of Manufacturing Sector in Nigeria: An Econometric Approach

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**Abstract**

The study empirically examined the contributions of exchange on the growth of manufacturing sector in Nigeria. The specific objectives were to; examine the impact of exchange rate, money supply, and trade openness on the performance of the manufacturing sector in Nigeria. Secondary data was extracted from Central Bank of Nigeria statistical bulletin, 2020. Ordinary least square of multiple regression technique was employed to examine the impact of independent on dependent variables. Based on the results, the findings revealed that exchange rate had a negative and significant impact on performance of manufacturing sector, while money supply and trade openness had a positive and significant effect on the performance of the manufacturing sector. The study recommended that the monetary authority should introduce direct policies of regulating price stability in the economy via regulating money supply in order to decelerate the rising inflationary trend in the economy.

**Keywords:** exchange rate, money supply, trade openness, manufacturing sector

## 1. Introduction

Exchange rate influences domestic prices through their effects on aggregate supply and demand. In general, when a currency depreciates, it will result in higher import prices if the country is an international price taker, while lower import prices result from appreciation. The potentially higher cost of imported inputs associated with exchange rate depreciation increases marginal costs and leads to higher price of domestically produced goods. Further, import competing firms might increase prices in response to foreign competitor price increases to improve profit margins. The extent of such price adjustment depends on a variety of factors such as market structure, the relative number of domestic and foreign firms in the market, the nature of government exchange rate policy and product substitutability (Adeniyi, 2012).

Ehinomen and Oladipo (2012) views that Central Bank of Nigeria (CBN) in its annual reports (various editions) highlighted that during the 1960s and early 1970s, manufacturing activities were positively accelerated, and value added per worker was at par with, if not higher than that in other African countries such as Botswana, Ghana and Kenya. During this period the share of manufacturing in GDP nearly doubled from less than 5 per cent to 8 per cent and on that trend many people believed that the country was on a path to industrialization. It was observed, however, that as from the 1980s manufacturing firms in Nigeria experienced relative stagnation as the sector's value added per capita lagged behind that of many comparative countries.

Presently, the manufacturing sector is experiencing collapse with an average capacity utilization hovering around 40 per cent. Most Nigerian manufacturing companies depend on imported inputs in the form of equipment, plant and machinery and other materials and given the fact that bulk of the country's foreign earnings is from oil which accounts for over 80.0 per cent of the foreign exchange earnings (CBN, 2008), thus revealing the extent of the vulnerability of these companies to swings in the exchange rate which is greatly affected by fluctuations in

the oil price in the international market. Mohammad (2010) noted that the risks associated with volatile exchange rates are major impediments for countries such as Nigeria that attempt to develop through export expansion strategy and financial liberalization.

Nigerian manufacturing sector has remained underdeveloped and is not showing significant growth despite the implementation of Structural Adjustment Programme (SAP). According to Ahmad (2010), apart from objectives not realized, exchange rate policy and management under Structural Adjustment Programme (SAP) have left some issues unresolved and/or created some distortions in the economy, one of which is deindustrialization. Therefore, in practice, no exchange rate is clean or pure float, nor having a situation where it is left completely to be determined by market forces of demand and supply. Rather, the prevailing float system is well-managed, whereby, the monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives (Mordi, 2006). The specific objectives of the study are to: examine the impact of exchange rate, money supply, and trade openness on the performance of the Nigerian manufacturing sector.

## 2. Literature Review

The exchange rate of a currency is the price of that currency in terms of another. It is a very important price, which links the domestic price with international price. It generally represents the number of units of domestic currency that exchanges for one unit of foreign currency. The way the exchange rate is quoted is a matter of convention. In a free market economy, the exchange rate is determined by the inter play of supply and demand for that currency. In some cases, the exchange rate is administratively administered. Just as the price of any commodity is determined by the interplay of demand and supply, the exchange rate is primarily determined by the supply and demand of foreign currencies (Sangosanya & Atanda, 2012). From 1962 to 1973, the Nigerian currency was pegged to the Pound sterling on a 1:1 ratio before the latter was devalued by 10 per cent. Thereafter, the currency was allowed to move independently of the Pound Sterling.

In view of this Naira was appreciated in order to source imports cheaply to execute developmental projects. This enhances the reliance on imports, which eventually led to the depletion of external reserves. Therefore, in 1978, the CBN applied the basket of currencies approach as given in determining the exchange rate movement. The exchange rate during this period was determined by the relative strength of the currencies of the country's trading partners and the volume of trade with such countries. Weights were assigned to countries' currencies with the United States dollar and Pounds sterling dominating the exchange rate calculation. By 1981 there were gradual depreciation of the naira against the US dollar and/or the British pound sterling based on which currency ever was stronger.

With the introduction of the Structural Adjustment Program (SAP) in1986, the flexible exchange rate mechanism was adopted with the floating of the naira in the second-tier system; thus, the exchange rate was largely determined by the market forces. Although, these forces were expected to produce a clearing price as the basis for the allocation of foreign exchange, the monetary authorities still had the power to intervene in the market when necessary. Such intervention depended largely on the state of the balance of payments, the rate of inflation and domestic liquidity among other factors. Within the basic framework of market determination of the naira exchange rate, various methods have been applied and some adjustments carried out to fine-tune the system (Mordi, 2006).

### *2.1 Conceptual Framework*

Export expansion as one of the major determinants of economic growth has gained much currency in the field of international trade and finance. The general argument here is that the overall growth of countries could be generated not only by increasing the amount of labor and capital but also by expanding oil and non-oil exports as in the case of Nigeria. The positive association between free trade and economic growth is usually ascribed to classical writers of the nineteenth century. Worthy of mention in this regard include the originator of the idea; Adam Smith and others including Ricardo, James Mill, Torrens, John Stuart Mill who added value to this idea (Ayeni, 2012).

Whether or not trade policy of import substitution and export promotion promote economic growth and development has been the subject of debate in the economic literature; and especially in 1950s and 1960s as most developing countries followed import substitution, which then was regarded as the recipe for economic growth and development. Advocates of import substitution based their argument on the need for developing countries to carve a niche for themselves by developing trade policies that will encourage local technology. This seems to suggest the need to encourage indigenous technology and expertise through 'learning by doing' in the real sector of the economy (Adeniyi, 2012). This policy of import substitution was abandoned in Nigeria as in most developing countries in favor of export expansion. The proponents of export expansion argue that expanding exports benefits the domestic economy. It increases efficiency in resource use and allocation, creates substantial economies of scale in production, generates employment and hence economic growth.

Nigeria's economy is highly dependent on import for both consumption and production. Virtually all the major industrial raw materials are sourced from abroad while the country depends wholly on foreign supply for intermediate and capital goods. Production for exports is highly elastic because the major non-oil export products are basically primary produce whose prices have been on the downward trend and exogenously determined. Besides, these exports are slow in responding to exchange rate adjustment. The implication is that the economy is highly prone to external shocks and in the event of a crash in oil price, the economy may face decline in foreign exchange earning which may destabilize the exchange rate. Import Substitution industrialization (ISI), a strategy for the industrialization of less developed countries (LDCs), of concentrating initially on replacing imports by domestically produced substitutes has been pursued vigorously since the late 1950s in Nigeria. The facts surrounding the export performance of less developed countries (LDCs) in the last decade are well known: LDC exports in the 1960s grew almost twice as fast as in the 1950s, 6.6 per cent versus 3.5 per cent, but more slowly than exports of developed countries (DCs) (9.6 per cent).

However, there is considerable controversy about the factors responsible. In particular, there is disagreement about the relative importance of DC and LDC trade policies in determining the growth of LDC exports. As a result, policy prescriptions on how LDCs can expand exports hinge greatly on the conclusions one reaches about what has impeded LDC export growth in the past (Ahmad, 2010). In general, the factors affecting LDC export expansion fall into two broad categories: those that affect demand and those that affect supply. Within each category it is possible to distinguish the effects of policy and the effects of markets and institutional forces. It is extremely important that the factors affecting LDC exports must be placed in the proper perspective.

Evidence is accumulating that there is a strong positive correlation between export performance and overall output growth. While the interaction between export and output growth is quite complex, policies affecting export growth are crucial to attainment of overall growth objectives (Ayeni, 2012).

*2.2 Trade Openness*

Central to the structural adjustment program (SAP), which was introduced in 1986 in Nigeria, was the policy of trade openness. The essence of the policy was to deregulate the local economies so as to compete with the rest of the world. The cardinal objective was to ensure efficiency in resource utilization, avoid wastage, removal of continued misalignment in the foreign and domestic sectors, which led to persistent balance of payment deficits and to channel a path of economic recovery and growth. The main policy thrust involves removal of non-tariffs obstacles to imports, the rationalization and lowering of tariffs, establishment of market mechanism as a medium of foreign exchange rate determination and removal of fiscal disincentives and regulatory measures that prevent exports. Trade openness appears to be a controversial policy in the international economics and finance. The proponents of the policy argue that the policy promotes free trade and remove obstacles that may inhibit free trade.

*2.3 Money Supply*

Money has been seen as a generalized means of purchasing power that is acceptable as payment for goods and services. Thus, what constitute the money stock of any country would be those mediums that facilitate readily the exchange mechanism and command general acceptability. These would basically include currency (C) and demand deposits (DD) created by deposit money banks. Money is a temporary abode of purchasing power. The basic argument is that, since there seems to be an imperfect synchronization between income receipts and expenditure streams over time, then money must not only function as a medium of exchange, but also as a temporary store of purchasing power. By implication, the total money stock must not be restricted to M1 as expressed in equation (1) above. But must include any other asset that commands liquidity akin, or near to currency. These other assets have been described as quasi or near monies. Thus, they included in the money supply basket, the fixed interest-bearing time deposits of deposit money banks.

*2.4 Exchange Rate Policy in Nigeria*

The objectives of an exchange rate policy include determining an appropriate exchange rate and ensuring its stability. Over the years, efforts have been made to achieve these objectives through the applications of various techniques and options to attain efficiency in the foreign exchange market. Exchange rate arrangements in Nigeria have transited from a fixed regime in the 1960s to a pegged regime between the 1970s and the mid-1980s and finally, to the various variants of the floating regime from 1986 with the deregulation and adoption of the structural adjustment program (SAP). A managed floating exchange rate regime, without any strong commitment to defending any particular parity, has been the most predominant of the floating system in Nigeria since the SAP. Following the failures of the variants of the flexible exchange rate mechanism (the AFEM introduced in 1995 and the IFEM in 1999) to ensure exchange rate stability, the Dutch Auction System (DAS) was reintroduced on July 22, 2002. The DAS was to serve the triple purposes of reducing the parallel market premium, conserve the dwindling external reserves and achieve a realistic exchange rate for the naira. The DAS

helped to stabilize the naira exchange rate, reduce the widening premium, conserve external reserves, and minimize speculative tendencies of authorized dealers.

The foreign exchange market has been relatively stabilized since 2003. As indicated by Mordi (2006), the conditions that facilitated the re-introduction of DAS in 2002 included, the external reserve position which could guarantee adequate funding of the market by the CBN; reduce inflationary pressures; instrument autonomy of the CBN and its prompt deployment of monetary control instruments in support of the DAS as well as the bi-weekly auctions as against the previous fortnightly auctions, thus assuring a steady supply of foreign exchange. In order to further liberalize the market, narrow the arbitrage premium between the official inter-bank and bureau de change segments of the markets and achieve convergence, the CBN introduced the wholesale Dutch auction system (WDAS) on February 20, 2006. This was meant to consolidate the gains of the retail Dutch Auction System as well as deepen the foreign exchange market in order to evolve a realistic exchange rate of the naira. Under this arrangement, the authorized dealers were permitted to deal in foreign exchange on their own accounts for onward sale to their customers.

*2.5 Exchange Rate and Growth of Manufacturing Sector*

Ettah, Akpan and Etim (2012) studied the effects of price and exchange rate fluctuations in 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 had a negative sign. Asher (2012) opined 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 uncertain in the trade transaction. This has resulted to declines in standard of living of the population increase in costs of production which has resulted in cost-push inflation. Owolabi and Adegbite (2012) examined 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 had significant effects on the economic growth with the adjusted $R^2$ of 69 per cent.

Opaluwa, Umeh and Ahmed (2010) stated that coefficients of the variables carried both positive and negative signs. It also showed adverse effect and all statistically significant in the final analysis. They observed that there was 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 that of the growth of exports (oil). These factors have tended to sustain a pattern of real exchange rate management and are necessary but not adequate to revive the Nigerian economy.

Azeez, Kolopo and Ajayi (2012) revealed that oil revenue and balance of payment exerted negative effects while exchange rate volatility contributed positively to GDP in the long run. Oladipupo and Onotaniyohuwo (2011) in their view, exchange rate had a significant impact on the balance of payments position. The exchange rate depreciation could 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 and Olodipo (2012) said that in Nigeria, exchange rate appreciation had a significant relationship with domestic output, and it would promote growth in the manufacturing sector. It also ascertained that there was a positive relationship between the manufacturing gross domestic product and inflation.

*2.6 Empirical Evidences*

Many scholars have conducted empirical research in order to examine factors that influence exchange rate. For instance, Yu Hsing (2006) empirically examined the determinants of short-term real exchange rates for Venezuela. The author confirmed that government deficit has positive effect on exchange rate, while broad money supply, world interest rate, country risk, and the expected rate of inflation had negative impact on exchange rate. The author suggested that authorities should avoid fiscal indiscipline in order to prevent the exchange rate from real appreciation since it will check the country's exports from declining. Peterson (2005) investigated the variables that affect exchange rate movements in Sweden, the United Kingdom and Japan against the US dollar for the period 1995 to 2004. The results indicate that interest rate differential is statistically significant in explaining changes in exchange rate in the three countries. In addition, interest rate had negative effect on exchange rate in Sweden and the United Kingdom. However, the influence of money supply, industrial production, and inflation differential on exchange rate varied between the countries.

Odedokun (2017) studied a group of 38 African countries, by examining the impact of macroeconomic policies, devaluation and fundamentals on real exchange rate movement. The author found that public sector fiscal deficits, growth of domestic credit, domestic absorption-GDP ratio, government consumption-GDP ratio, private consumption-GDP ratio, improvement in terms of trade, income per capita and black market exchange rate premium lead to real exchange rate appreciation. On the contrary, devaluation, investment-GDP ratio,

consumer-wholesale price ratio in trading-partner countries, and economic growth in industrial countries result in real exchange rate depreciation.

Drine and Rault (2003) analyzed the main determinants of the real exchange rate in the Middle East and North African (MENA) countries. The authors' findings illustrate that output, per capita, government consumption, real interest rate differentials, and the degree of openness of the economy influence the real exchange rate. In Zambia, Beatrice (2001) employed a co-integration technique to investigate the long-run determinants of the real exchange rates for imports and exports, and of the internal real exchange rate. The results showed that real exchange rate for imports is affected by terms of trade, government consumption, and investment share. Moreover, terms of trade, central bank reserves and trade taxes have long-run impact on the real exchange rate for exports. It was also found that terms of trade, investment share, and the rate of growth of real GDP have long-run effect on the internal real exchange rate. Lastly, foreign aid and openness have short-run influence on the real exchange rate indices. Faulkner and Makrelor (2008) used the single Engel Granger techniques to examine the drivers of the manufacturing equilibrium exchange rate over the period 1995 to 2006 in South Africa. The author's results showed that unit labor cost, productivity, government expenditure, and openness are the main drivers of the manufacturing exchange rates.

*2.7 Theoretical Framework*

This study is anchored on Purchasing power parity which was propounded by Rogoff in 1996. The theory constitutes one of the fundamental building blocks in modeling modern theories of exchange rate determination. The origin of purchasing power concept has been traced to the 16th century Salamanca School of Spain. During the nineteenth century, classical economists, like Ricardo, Mill, Goshen and Marshall endorsed and developed more or less qualified Purchasing power parity views. Rogoff (1996) postulated that the theory, in its modern form, is credited to Gustav Cassel, a Swedish economist, who developed and popularized its empirical version in the 1920s. He opined that the nominal exchange rate should reflect the purchasing power of one currency against another. His proposal was that a purchasing power exchange rate exists between any two countries, and it is measured by the reciprocal of one country's price level against another.

## 3. Methodology

Ex-post facto research design was employed in this study because it has to do with the facts that are in existence. The secondary source of data is the most reliable data for this study; and this specific source of the data for the study is the Central Bank of Nigeria statistical Bulletin. The study utilized annual time series data from 1990–2020. The variables are built into a functional relationship. The functional relationship between the variables is expressed as

MGI = F (EXCHR, MS, TO)

MGI = Manufacturing growth index

EXCHR = Exchange rate

MS = Money supply

TO = Trade openness

$MGI = b_0 + b_1EXCHR + b_2MS + b_3TO + e$

Where;

Dependent variable = MGI

Independent variable = EXCHR, MS, TO

Regression constant = $b_0$

Unknown parameters = $b_1 – b_3$

Stochastic Error Term = e

The ordinary least square (OLS) model of multiple regression is adopted to statistically analyze the relationship between dependent variable and independent variables.

## 4. Results and Discussion of Findings

The regression result of exchange rate on the growth of manufacturing sector.

Table 1. Regression Result

| Dependent Variable: LMGI | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |

| | | | | |
|---|---|---|---|---|
| C | 2.327873 | 0.337660 | 6.894133 | 0.0002 |
| EXCR | -3.746307 | 1.657189 | -2.260630 | 0.0000 |
| MS | 0.972772 | 0.099138 | 9.812302 | 0.0000 |
| TO | 3.481684 | 0.932634 | 3.733172 | 0.0000 |
| R-squared | 0.705674 | Mean dependent var | | 8.691518 |
| Adjusted R-squared | 0.632093 | S.D. dependent var | | 2.342172 |
| S.E. of regression | 0.278468 | Akaike info criterion | | 0.765343 |
| Sum squared resid | 2.657466 | Schwarz criterion | | 0.789549 |
| Log likelihood | 5.674380 | Hannan-Quinn criter. | | 0.567438 |
| F-statistic | 9.590378 | Durbin-Watson stat | | 2.348589 |
| Prob(F-statistic) | 0.000000 | | | |

Source: Researcher's computation from E-views

This is given by the high value of the R-squared of 0.7056 (71 per cent) and the adjusted R-squared of 0.6320 (63 per cent). The adjusted R-squared of about 63 per cent of the systematic variations in the performance of the Nigerian manufacturing sector has been explained by changes in exchange rate (EXCR), money supply (MS), and Trade openness (TO). In the same vein, the high value of F-statistics (9.590) shows that the overall model is statistically significant. The overall significance of the short-run model implies the joint significance of all explanatory variables in explaining short-run changes in the performance of the Nigerian manufacturing sector. Further examination of the result shows that there is no problem of autocorrelation in the model. This is so because the Durbin-Watson (DW) statistic value of 2.34 falls within the acceptable region of no autocorrelation. From the policy stance, this means that the finding of this study can be applied for policy purposes in the Nigerian economy. The result also revealed that a change in exchange rate (EXCR) has negative but significant effect on the performance of the Nigerian manufacturing sector. A one per cent increase in exchange rate will result in a negative change on the performance of the Nigerian manufacturing sector. Similarly, the variations in money supply (MS) and trade openness (TO) will lead to a significant and positive effect on the performance of the Nigerian manufacturing sector. This means that, a unit increase in money supply and trade openness would result in a positive change on the performance of the Nigerian manufacturing sector. The main thrust of this study was to assess the contributions of exchange rate on the growth of manufacturing sector. The findings showed that exchange rate has a negative effect on the growth of manufacturing sector while money supply and trade openness have a positive and significant effect on the growth of manufacturing sector.

## 5. Conclusion/Recommendations

This study was carried out to assess the contributions of exchange rate on the growth of manufacturing sector. The exchange rate of a currency is the price of that currency in terms of another. It is a very important price, which links the domestic price with international price. It generally represents the number of units of domestic currency that exchanges for one unit of foreign currency. The way the exchange rate is quoted is a matter of convention. In a free market economy, the exchange rate is determined by the inter play of supply and demand for that currency. With the introduction of the Structural Adjustment Program (SAP) in1986, the flexible exchange rate mechanism was adopted with the floating of the naira in the second-tier system; thus the exchange rate was largely determined by the market forces. Although, these forces were expected to produce a clearing price as the basis for the allocation of foreign exchange. The study recommended thus;

1) There is need for local sourcing of raw materials and input through agriculture and technological policy. By so doing, it will lead to expansion of export base which would attract more foreign exchange into the country.

2) The monetary authority should introduce direct policies of regulating price stability in the economy via regulating money supply in order to decelerate the rising inflationary trend in the economy.

3) It is pertinent that the devaluation of the naira in association with factors such as technology and human skills are necessary for the manufacturing sector to be established in the export market.

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