

## Exchange Rate Shocks and Trade Balance in Sub-Saharan Africa: The Case of Nigeria

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### ABSTRACT

The study explored exchange rate shocks and trade balance in sub-Saharan Africa: The case of Nigeria. The study made use of annual secondary time series data called from Central bank statistical bulletin for the period 1980 - 2015. Specifically, the study aimed at investigating the effect of exchange rate shocks in trade balance, oil and non-oil export, industrial growth. The study adopted ex-post facto research design. The study conducted some pre-test: stationarity test; cointegrated and vector error correction mechanism (VECM). The result showed that the series were stationary at first difference I(1) and manifested long run stability following the ADF unit root test and Johansen cointegration test conducted. The VECM result obtained indicated that persistent exchange rate shock significantly affected Nigeria's trade performance and by extension Africa's trade balance. Most African economies have continually suffered adverse trade deficit occasioned by exchange rate shocks. Thus, the result simply echoes the findings of other studies and the precarious trade situations faced by Nigeria. To reduce the effect of trade balance on Africa's economy, Nigeria in particular, there is need to stabilize the exchange rate through deliberate policy of raising the country's foreign reserve and lower the country's imports volumes.

**Keywords:** Exchange rate shocks, trade balance, foreign reserve, oil export, industrial growth, non-oil export.

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### INTRODUCTION

The primary objective of foreign exchange rate stability policy pursued by a country is to achieve trade balance of economic growth. The critical elements of foreign trade include imports and exports of goods and services. Specifically, a country that focused on the importation of capital goods would deeply have greater tendencies to promote economic growth,

rather than those who rely solely on the importation of consumable goods. Theoretical validation reveals that foreign trade has positive effects on economic growth, through capital accumulation, technological progress, industrialization and institutional development, it becomes imperatively expedient to stabilize exchange rate for the goals of economic

prosperity to be realized. It specifically increases imports of capital goods and intermediate products that the domestic market lacks in order to stimulate the productivity of manufacturing sector [1, 2]. In Nigeria, knowing full well that foreign trade is very important for economic growth and development of an economy, it is the expectation of the citizens that the economy by now would have grown or per capita incomes improves with expansion of opportunities for the people in the country; and that the economy ought to have ranked among the top fast growing economies in the world. but in this case, the story is different as the economic growth of the country continued being insignificant alongside per capita income decreasing at unimaginable proportional rate, especially with the emergence of crude oil and its attendant oil boom in early 1970s. Poverty and infrastructural decay cannot be left behind, as the two situations have continued to deteriorate the living standard of people in the country. The question is; what happened to foreign export earnings of the country? Are they converted to consumption expenditures only? Theoretically, it was argued that

export earnings are meant to implement socio-economic projects in order to improve the living standard of citizens by expanding their lives opportunities. The import on the other hand, is associated with technological knowledge. In this case however, does it mean that Nigeria lacks knowledgeable humans to help improve productivity and develop the economy? Or does it mean that the country mostly imports consumable goods and no intermediate goods? All well-meaning Nigerians should be much concern as to why the country instead of achieving the gains associated with foreign trade, continued to witness low output and poor economic growth, low investment, high rates of unemployment and inflation, exchange rate depreciation, low standard of living and adverse balance of payments among others. Other consequences of this development include excessive borrowing, fiscal deficits, debt servicing, over dependence on importation of consumable goods, balance of trade deficits and a decrease in foreign reserve. In view of the above, it is therefore pertinent to investigate the impact of foreign trade on economic growth of Nigeria for the period under study.

### **Review of Theory**

#### **Theory of Absolute Trade Advantage:**

The theory of absolute advantage was postulated by [3] in his famous book titled "Inquiry into the Nature and the Wealth of Nations". The theory emerged due to the demise of Mercantilism, which advocated for imports, control, regulation and restrictions in a country. In contrary, Adam Smith in his theory advocated for free trade in an economy. In his argument, he stated that if free trade is allowed to run in an economy, each nation would specialize in the production of those goods and services in which they can produce more efficiently than others.

Furthermore, the theory argued that international specialization of factors in production would result in increase in the world output, and that foreign trade is a positive sum game; this is because there are both gains for both countries in an exchange [4]. Thus, it stated that a nation should not in any way benefit at the expense of other nations; therefore, all nations would gain from trade simultaneously and make goods available to all nations of the world.

### **Comparative Advantage Trade Theory**

The theory of comparative advantage trade was propounded by David Ricardo in 1817. The theory assumed the existence of two countries, two commodities and one factor of production. In this theory, it was postulated that a country should export commodities in which it has comparative advantage over its trading partners and therefore, import commodities that it has comparative disadvantage over its trading partners. The theory assumed equal level of technology among the trading nations, which it believed that was fixed for both nations and that trades are balanced and rolls out the flow of money among the

nations [5]. More so, the theory was also based on the labour theory of value, which states that the price of the value of a commodity is equal to the labour time going into the production process. Hence, labour was used as a fixed proportion in the production of all commodities. In the context of two countries and two commodities, the theory argued that trade would still take place between the two countries even if one country produced more efficiently than the other in as much as the degree of its superiority over the other was unidentical for both commodities.

### **Heckscher-Ohlin Trade Theory**

The theory of Heckscher-Ohlin trade looked at the differences in relative factor endowments and factor prices between nations based on the assumption that there is existence of equal technology and tastes. The theory also focused on two major propositions, namely; that a country would specialize in the production and export commodities whose production requires intensive use of abundant resources. Secondly, that all countries of the world differ in factor endowment. This is because, while some countries are capital intensive, other

countries are endowed with labour and hence are labour intensive. It also acknowledges differences in pre-trade product prices between nations as the immediate basis for trade, as it argued that prices depend on production possibility curve as well as tastes and preferences [6]. According to the theory, the production possibility curve depends on factor endowment and technology. A nation should produce and export a product for which the resources used is either capital or labour intensive [7].

### **Empirical Studies**

There are various increasing coverage of empirical studies concerning the relationship between foreign trade and economic growth in both the context of developing and developed countries of the world, some of which reviewed to authenticate or back this research study. They include [8] studied the macroeconomics impact of trade on Nigerian growth, using the combinations of bivariate and multivariate models for the period of between 1970 and 2008. The variables used for the investigation

include gross domestic product, export and foreign direct investment. The empirical results showed that exports and foreign direct investment inflows are positive and significant determinants of economic growth in Nigeria.

[9] investigated the relationship between foreign trade and economic growth in Nigeria for the period from 1970 - 2010, using econometric technique such as Johansen co-integration approach. The variables employed in the study include real gross domestic product, exchange

rate, import, export, foreign direct investment, inflation rate and openness. The results showed that export and foreign direct investment have positive relation with RGDP, while other variables such as exchange rate, import, inflation and openness were shown to exert negative influence on the real GDP within the period under reviewed.

[10], investigated the significant role of non-oil export on economic growth in Nigeria for the period of 1980-2010 using ordinary least square methods, which include error correction model, over-parametization and parsimonious, as well as Johansen co-integration test. The stationery test of time series data through the applications of the Augmented Dickey-Fuller (ADF) and the Philip-Peron unit root test indicated that all the variables were stationary at first difference. The result of the cointegration test revealed that long run equilibrium relationship exists between the variables under study.

In a study conducted by King-George (2013) on the effect of exchange rate

fluctuations on the Nigerian manufacturing sector for the period 1986 - 2014 applying the regression analysis method, the result showed that exchange rate movements has no significant effect on manufacturing sector output. However, the works of [10] differs from the works of King George. In his study, he found that exchange rate shocks have long run and short run effects on international trade and manufacturing output. The study adopted econometrics tools using time series data to investigate the effect of exchange rate shocks on trade balance in Nigeria for the period 1970 - 2012. The result indicated that exchange rate shock depressed exports in Nigeria. [1] in their respective study on exchange rate shocks and macroeconomic variable, applying different technique found that exchange rate volatility have significant negative effects on key macroeconomic variables such as trade balance, industrial output and economic growth.

#### METHODOLOGY

The study adopts ex-post facto design based on the fact that the period data used is time series which takes into account of events that have taken place and the date is collated over a given period and as such cannot be manipulated by the researcher. Ex-post facto research design is most appropriate in this type of

research because it seeks to investigate the cause and effect relationships among economic variables. The study has one dependent variable (trade balance) and three independent variables (exchange rate, oil export and non-oil export, industrial output)

#### Model Specification

The model of the study is specified in line with theory and practice.

$$TB = f(EXR, OEXP, NOEXP, INDG)$$

$$\log TB = \beta_0 + \beta_1 \log EXR, \beta_2 \log OEXP, \beta_3 \log NOEXP, \beta_4 \log INDG$$

Stationarity Tests: In order to test for the time series properties of data set the Augmented Dickey Fuller (ADF) test statistic was employed. The unit root test

results shown in table 1 below revealed that the variables are stationary at levels I(0).

## RESULTS

### Stationarity test (Unit Root Tests)

Sample: 1980 - 2015

Test type: ADF

Level	First	Second	Order of Int.
EXR	-6.10381	-4.79169	I(0)
IIOIL	-6.10966	-4.76242	I(0)
IINOIL	-6.80783	-5.75722	I(0)
1% level	-3.65373	-3.66166	-3.68919
5% level	-2.95711	-2.96041	-2.97185
10% level	-2.61743	-2.61916	-2.62512

### Cointegration result

#### Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Eigenvalue	Trace	Critical Value	Prob.**
None *	0.687112	116.3281	59.75344	0.0000
At most 1 *	0.879034	133.39	85.81617	0.0000
At most 2 *	0.862840	76.2149	37.41465	0.0002
At most 3	0.378904	18.1416	26.22472	0.5127
At most 4	0.159752	5.4291	13.81762	0.4629
At most 5	0.021742	2.1114	5.51271	0.3592

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

OLS estimated results derived from Vector Error Correction Model (VECM)

$$TB = 0.3479 - 0.3049EXR + 5.046NOEX + 1.156OEX - 0.981INDG$$

(0.0762)      (0.1325)      (1.7620)      (0.5167)      (0.015)

$$R^2 = 0.75, F\text{-stat} = 3.67, DW = 1.965$$

### FINDINGS

The effect of exchange rate variation on trade balance in Nigeria was analyzed using the results of vector error correction model and cointegration respectively. The VECM analyzed the short run impact of exchange rate variation on trade balance; Johansen cointegration examined the long run

relationship between exchange rate variation and trade balance in Nigeria. The previous trade balance has significant impact on the current trade balance. This is due to the fact that the p-values (0.0044 and 0.0001) of trade balance is an indication that it contributes to the current level of trade balance in Nigeria.

Exchange rate (EXR-1) with the p-value (0.0000) proved to be statistically significant. Its negativity is a reflection that it has short run negative impact on trade balance. This revealed that exchange rate shocks worsen trade balance in the short run which is in conformity with the postulations of J-curve theory. However, oil export and non-oil export shows significant contribution towards achieving favourable trade balance. On the other hand industrial development of the country has been low thereby resulting to negative effect on trade balance. The increase in import demand further complicated the already deteriorating trade balance, thereby worsening the precarious trade balance in Nigeria.

However, the short run negative consequences of exchange rate variation on trade balance will be settled in the long run as revealed by error correction term (ECT-1). The coefficient of ECT-1 revealed its capacity to restore the economy back to equilibrium in the long. The p-value of 0.0006 indicates significant at 0.05 levels. The coefficient of 0.6745 indicated that the short run contraction impact of exchange rate variation will be corrected within a short period of time. It will contribute 67.45 percent per annum for equilibrium to be restored in the long run. The significance and negative sign of ECT-1 is in line with J-curve which postulates that for Marshall-Lerner condition to set in and promotes trade balance, it will take a time frame of few months to two or three years [7]. Therefore, the concluded that J-curve holds for Nigeria. The cointegration result further affirmed the position of ECT-1 that exchange rate variation has the capacity to improve trade balance of Nigeria in the long run. The result validated [8] who pointed that exchange rate stability has short run contractionary

effects while exhibiting expansionary effects in the long run. The result conforms with the findings of [6] that exchange rate shocks have negative effect in Nigeria's international trade performance.

The following recommendations were made based on the findings of this study to profer solution to the problem of exchange rate variation on macroeconomic fundamentals in Nigeria.

1. The depletion of foreign reserve has been identified as responsible for the deterioration of exchange rate in Nigeria. Therefore, emphasis should focus on building adequate foreign reserve that will serve as buffer whenever the country is exposed to global trade uncertainty. This will go a long way to stabilize the value of naira and cushion-off-trade shocks.

Over dependent of the economy on imports has been recognized as one of the factors responsible for depletion of Nigerian foreign reserve. Nevertheless, to end undue pressure on the country's foreign reserve, government should endeavor to correct the narrative by embarking on import substitution strategy. This will put the country on the path of trade surplus.

In the short run, depreciation of naira has been discovered to contribute significantly to output decline, deficit trade balance and high inflation in Nigeria. However, it becomes irrelevant to rely on devaluation as a measure to correct unfavourable trade balance. Instead, it is advisable to embark on economic modernization centered on

- technology and human capital development.
2. Government should take advantage of global competitiveness of domestically produced goods to develop the real sectors of the economy. This will promote exports and correct deficit trade balance.
  3. The short run debilitating effects of exchange rate variation is revelation that productive capacity of economy is too weak to stimulate export. Therefore,

emphasis should focus on strategies to promote export oriented industries to maximize the competitive advantage provided by variation of exchange rate.

4. The economy should be diversified to provide the country with wide range of commodities for export. This will ensure balance of trade and growth of the economy thereby preventing the deterioration of Naira.

### CONCLUSION

The study showed exchange rate shocks has debilitating effect on the economy. It contracts output and trade balance in short run which is in line with the postulations of structuralist theory (exchange rate-pass-through). The study

also blamed the present input demand in Nigeria on the deterioration of exchange rate over the years but disassociated the high unemployment

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