



## THE NEXUS BETWEEN EXCHANGE RATE AND EXPORT IN NIGERIA

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### Abstract

*The study examined the relationships between exchange rate and export in Nigeria. Using export, exchange rate, interest rate and inflation as research variables, the study also employ ARDL Bound testing as the technique of analysis. Finding indicates that in the short-run, there is a positive and significant relationship between exchange rate and export, while it confirms an insignificant relationship between interest rate, inflation and export. The long-run analysis indicates that, further increase in exchange rate is associated with an increase in export. The study recommends that there is the need for government to supply foreign exchange to meet the demand optimally; this requires the creation of policies and measures that will boost export in the country.*

**Key words:** Exchange Rate, Export, Performance, Inflation, Nigeria

### 1. Introduction

Export performance is of paramount importance because it contributes to the economic development of nations by influencing the amount of foreign exchange reserves as well as the level of imports a country can afford (Ajinaja, Popoola & Ogunlade, 2017). It enhances societal prosperity and help national industries to develop increase productivity and create new jobs; export provides an opportunity for firms to become less dependent on the domestic market. By reaching new customers overseas, the firms may also explore economies of scale and achieve lower production costs while producing more efficiently (Ajinaja et.al, 2017). Exchange rate is a prominent determinant of world trade receiving much attention in the context of global imbalance (Obadan, 1996). Economists believe that appreciation of exchange rate increases imports while depreciation would increase exports and discourage imports (Oluyemi, 2017). In line with this, the study is aimed at assessing the direct relationship between exchange rate and export in Nigeria from 1986 to 2015.

### 2. Empirical Literature Review

Empirically, there is a growing literature on the relationship between exchange rate and export performance. However different conclusions were made depending on the country, study period and the type of data used. Moshen (2013) made research on the effect of exchange rate on imports, exports, product prices and other macroeconomic variables from 1960 to 2012. He used Vector Autoregression model, Cointegration test and Impulse Response Function for the analysis. His results showed that exchange rate has no effect on macro-economic variable. Godfrey and Cosmas (2014) made investigation on the impact of exchange rates on exports, imports and national output Tanzania. (1990 – 2011). The study adopted Vector Error correction model, Impulse Response Function, Variance Decomposition and Time series Simulation. Their result shows that variables have long run relation and converging at equilibrium as times passes but lower long run impact on export and import. Olufayo and Babafemi (2014), explored the effects of exchange rate volatility on the exports performance of both oil and non-oil sectors in Nigeria using GARCH and seemingly unrelated



regression method (SUR) in estimating the coefficient of the two system equation. ARCH and GARCH results suggested that the exchange rate is volatile, while SUR model shows that exchange rate has negative effect on the two sectors, though statistically not significant. Therefore, for the country export to improve, the country should adopt inward looking policy in order to enhance her capability to export and reduce the vulnerability of the country to the external shocks.

Ajinaja et al (2017) investigated the impact of variables such as gross domestic product (GDP), exchange rate fluctuation (EXCt) and foreign direct investment on export performance (Xt) in Nigeria. All data used were secondary data obtained from the Statistical Bulletin of Central Bank of Nigeria from 1982 -2015. Ordinary Least Square method was used to analyze the data and it was deduced that gross domestic product (GDP), exchange rate fluctuation (EXCt) and foreign direct investment have positive relationship to export performance (Xt) in Nigeria. Aliyu (2008) quantitatively assess the impact of exchange rate volatility on non-oil export flows in Nigeria. Theoretically, volatility-trade link is ambiguous, although a strand of studies reported inverse link between export flow and volatility. The study employed fundamental analysis where the flow of non-oil exports from the Nigerian economy is assumed to be predicated on fundamental variables: the naira exchange rate volatility, the US dollar volatility, and Nigeria’s terms of trade (TOT) and index of openness (OPN). Results showed presence of unit root at level, however, the null hypothesis of nonstationarity was rejected at first difference. Cointegration results revealed that a stable long run equilibrium relationship exists between non-oil exports and the fundamental variables. Using quarterly observations for twenty years, vector cointegration estimate revealed that the naira exchange rate volatility decreased non-oil exports by 3.65% while the same estimate for the US dollar volatility increased export of non-oil in Nigeria by 5.2% in the year 2003. The paper recommends measures that would promote greater openness of the economy and exchange rate stability in the economy. Chamunorwa, and Choda, (2015) investigate the relationship between exchange rate volatility and export performance in South Africa. The main objective of the study was to examine the impact of exchange rate volatility on export performance in South Africa. This relationship was examined using GARCH methods. Exports were regressed against real effective exchange rate, trade openness, and capacity utilisation. The research aimed to establish whether exchange rate volatility impacts negatively on export performance in the manner suggested by econometric model. The result obtained showed that exchange rate volatility had a significantly negative effect on South African exports in the period 2000-2011.

**3. Methodology**

To determine the impact of exchange rate on export performance in Nigeria, the study modifies the Olufayo and Babafemi (2014) model.

$$EXP = f(EXR, INT, INF) \dots\dots\dots 1$$

Where EXP represents export, EXR represents exchange rate, INT represents interest rate and INF represents inflation. The study also employs the autoregressive distributed lag (ARDL) bounds testing approach, proposed by Pesaran and Shin, (1999) as the technique of analysis. ARDL technique is unique because it possesses some advantages that make it superior to most of the other traditional technique. Also, ARDL model considers the error correction term in its lagged period, whereby both the long-run and the short-run relationships of the variables under consideration are covered by the analysis of the error correction lag and the autoregressive lag (Farhani & Ozturk, 2015). The version of the unrestricted error correction model (UECM) of the ARDL model used in this study is expressed as:



$$\Delta EPX = \beta_0 + \sum_{j=1}^n \beta_1 LEXP_{t-j} + \sum_{j=0}^n \beta_2 LEXR_{t-j} + \sum_{j=0}^n \beta_3 LINT_{t-j} + \sum_{j=0}^n \beta_4 LINF_{t-j} + \alpha_1 LEXP_t + \alpha_2 LEXR_t + \alpha_3 LINT_t + \alpha_4 LINF_t + \varepsilon_t \dots 2$$

$$\Delta EPX = \beta_0 + \sum_{j=1}^n \beta_1 LEXP_{t-j} + \sum_{j=0}^n \beta_2 LEXR_{t-j} + \sum_{j=0}^n \beta_3 LINT_{t-j} + \sum_{j=0}^n \beta_4 LINF_{t-j} + \alpha_1 LEXP_t + \alpha_2 LEXR_t + \alpha_3 LINT_t + \alpha_4 LINF_t + \nu_0 ECT_{t-1} + \varepsilon_t \dots 3$$

$$LEXP = \alpha_0 + \alpha_1 LEXP_t + \alpha_2 LEXR_t + \alpha_3 LINT_t + \alpha_4 LINF_t + \varepsilon_t \dots 4$$

Where  $\varepsilon$  represent the error term, t indicates the time trend and  $\Delta$  represents the first difference operator. The minimum value of akaike information criteria (AIC) is the basis upon which the correct lag length of the first difference regression is selected. The decision concerning the long-run relationship is based on the F statistic. The null hypothesis stated that  $H_0: \beta_i = 0, \forall_i (i = E, E, I, I)$  while alternative hypothesis is that  $H_1: \text{at least one } \beta_i \neq 0, \forall_i (i = E, E, I, I)$  Here, (Pesaran *et al.*, 2001) generated two asymptotic critical values; these are the lower critical bound (LCB) and the upper critical bound (UCB). The LCB is used for the test if all the variables are I(0) otherwise the UCB is used. In the case of this study, if the calculated F statistic of the estimated ARDL bound is higher than the upper bound, the null hypothesis of no relationship is rejected and the conclusion is that there is a cointegration among the variables under consideration and hence the long-run association between the variables exists.

On the contrary, if the calculated value of the F statistic for the estimated ARDL bound is below the lower bound we do not reject the null hypothesis of no relationship among the variables and in this case, the conclusion is that there is no cointegration among the variables under consideration. Furthermore, in order to determine the short- and long-run causal association among the variables, a dynamic error correction model was estimated. The error correction term (ECT) explains the long-run dynamism by its significant negative value. On the other hand, the short-run reaction was explained by the lagged terms of the estimate individual coefficient.

#### 4. Result

The findings of the estimated result based on the ARDL bound test approach. However, prior to the estimation, the stationarity property of the time series data was tested using Phillips Peron tests. The unit root tests result are shown in Table 1. The values in parenthesis are the respective probabilities, while the asterisks \* denote significant at 1% level.

**Table 1: Present the stationarity test result of the variables**

Variables	PP	PP
	Level	1 <sup>st</sup> Difference
LEXP	-0.542676(0.8685)	-9.59507*( 0.0000)
LEXR	-3.423398* (0.0183)	
LINT	-13.40846* (0.0000)	
LINF	-2.592139 (0.1102)	-4.573999* (0.0029)

Source: Researchers computation using e-views 9 computer software; Notes: \* represents statistically significant at 1 percent level. Figures in parenthesis represent probability. PP is Phillips Perron.

From the table variable LEXP and LINF are both stationary at first difference at 1% level of significance, while variables LEXR and LINT are stationary at level at 1% level of significance. The



mix order of integration of the variable serve as a basis to employ ARDL Bound testing approach as the most suitable technique of analysis.

**Table 2: Result of bound test**

	Lower bound	Upper bound
Critical values	4.29	5.61
F-Statistics	9.828057	

*Source: Researchers computation using e-views 9 computer software*

From table 3, the bound test result confirms the existence of long-run relationship since the value of F-statistic is higher than the upper-bound test critical values of 5.61 and lower bound of 4.29 at 1 percent level of significance.

**Table 3: Short Run and Long Run Results**

S.R Regressors	Coefficients	SD Errors	t-Statistics	Prob
ΔLEXR	0.007142	0.002386	2.992978	0.0122
ΔLINT	0.034899	0.024084	1.449045	0.1752
ΔLINF	-0.001947	0.001325	-1.469240	0.1698
ECT(-1)	-0.670253	0.132384	-5.062941	0.0004
L.R Regressors				
EXR	0.009582	0.000912	10.504935	0.0000
INF	0.001692	0.003585	0.472001	0.6462
INT	0.001365	0.037537	0.036362	0.9716
C	28.951371	0.207643	139.428557	0.0000

*Source: Researchers computation using e-views 9 computer software*

From table 3, the speed of adjustment is significant, this indicates that all variables can converge to equilibrium in the long run.

The short run result shows that exchange rate is positive and significant in explaining export in Nigeria. A 1% increase in exchange rate will lead to 0.71% increase in export, while interest rate and inflation are not significant in explaining export in Nigeria.

The long run analysis also indicates that in the long run, exchange rate is a positive and significant determinant of export in Nigeria. A 1% increase in the country's exchange rate will course a 0.9% rise in the country's export level. On the contrary going by the result of the analysis, in the long run inflation and interest rate are insignificant in determining export in Nigeria.

**Table 4: Post Estimation Diagnostic Checks**

Test Type	F-statistics	Probability	Result
Breusch-Pagan Test.	0.235329	0.9934	No Heteroskedasticity
Breusch-Godfrey Test	1.477307	0.2787	No Serial Correlation
Jarque-Bera	1.847760	0.396976	Normally Distributed

*Source: Researchers computation using e-views 9 computer software*

Table 4 presents the post-estimation diagnostic checks. The estimated model indicates that there is no Heteroskedasticity, serial correlation and the errors are normally distributed.



## 5. Conclusion and Recommendations

This study examined the relationships between exchange rate and export in Nigeria by employing ARDL Bound testing technique. The short-run analysis of this study reveals that there is a positive and significant relationship between exchange rate and export, while it confirms an insignificant relationship between interest rate, inflation and export. The long-run analysis indicates that further increase in exchange rate is associated with an increase in export.

Based on the estimated result of this study exchange rate is significant and positively related to export in Nigeria. This implies that for any 1% increase in exchange rate there would be 3% increase in export. Therefore, this study recommends that among the solution to this problem of instability in exchange rate and for supply foreign exchange to meet the demand optimally, this requires the creation of policies and measures that will boost export in the country.

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