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RESPONSIVENESS OF EXCHANGE RATE TO TRADE VOLUME IN NIGERIA (1986-2015)

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ABSTRACT

The aim of this study is to examine the responsiveness of exchange rate to trade volume in Nigeria (2000-2015). The study adopted an Ex-post facto design which is considered appropriate since it dealt with data that had already been compiled. Hence secondary data from the CBN statistical bulletin was analysed using descriptive statistics and ordinary least square method. The findings showed that there is a significant and positive relationship between exchange rate and import. The study equally revealed that there is a negative and significant relationship between exchange rate and export. This is in line with our a priori expectation and the balance of payment theory which states that a large currency account deficit (more imports than export) will result in the domestic currency depreciating (high exchange rate). On the other hand, a surplus (more export than import) is likely going to cause currency appreciation (low exchange rate). This aligns with Nigeria's position which over the years has experienced large balance of payment deficit with its attendant depreciation in currency value and consequential import overriding exportation. The paper then recommended that the government should endeavour to improve on its production base as to increase exports for increased foreign exchange earnings.

Keywords: Exchange rate, Import, Export and ordinary least square.

INTRODUCTION

The obviousness that no economy in the world is totally self sufficient and independent with regards to the possession of resources, goods and services to take care of its needs have resulted in international trade relationships. This relationship has directly or indirectly linked various economies through trade and exchange and is made more essential in recent times by globalization. Pigka-balanika (nd) in Fischer (2003), [1],

defined globalization as the ongoing process of greater economic interdependence among countries reflected in the increasing amount of cross-border trade in goods and services, the increasing volume of international financial flows and increasing flows of labour.

Trade channel is a critical channel for the transmission of exchange rate changes to an economy hence, international trade and foreign exchange is inseparable. The exchange rate being the rate, at which a currency is exchanged for another currency, plays an important role for exports and imports. Domestically, depreciation of a country's currency encourages substitution from imports to domestically produced goods and services, as imported products become relatively more expensive. A lower exchange rate also makes exports more competitive in world markets, as exported goods and services become relatively cheaper in foreign currency terms. Bourdon and Korinek (2011), [2], opined that trade deficits and surpluses are sometimes attributed to intentionally low or high exchange rate levels. The impact of exchange rate levels on trade has been much debated but the large body of existing empirical literature does not suggest an unequivocally clear picture of the trade impacts of changes in exchange rates.

According to Leigh, Lian, Poplawski-Ribrine and Tsyrenmikow (2016), [3], recent exchange rate movements have been unusually large, triggering a debate regarding their likely effect on trade. Historical experience in advanced and emerging markets and developing economies suggests that exchange rate movements typically have sizeable effects on export and import volume. Sequel to this, Nicita (2013), [4], opined that the exchange rate plays an important role in a country's trade performance. Whether determined by exogenous shocks or by policy, the relative valuations of currencies and their volatility often have important repercussions on international trade, the balance of payments and overall economic performance.

Lewis (2014), [5], in describing the responsiveness of exchange rate to trade volume opined that the response depends on both how often and how much destination prices move after a change in the exchange rate.

Intuitively, both aspects can help explain the empirical finding that trade values (and volumes) are largely unresponsive to exchange rate changes in the short run. First, if prices are stuck in the local currency, exchange rate movements will not affect the trade value or volume. Second, even if prices change but exporters choose not to pass through the exchange rate change fully, this will also dampen the trade response.

Cole and Nightingale (2016), maintained that movements in the exchange rate affect the relative prices of traded goods and services, and thus the competitiveness of domestic producers of exports and import-competing goods and services. Other things equal, a 10 per cent depreciation in the real exchange rate is estimated to increase export volumes by around 3 per cent and decrease import volumes by about 4 per cent after two years, which implies a cumulative net exports contribution to gross domestic product (GDP) of around 1½ percentage points over this period. However, the aggregate responses of exports and imports disguise substantial variation in the responses of the components. Trade in services is generally more responsive to movements in the exchange rate than trade in goods, although it takes longer for the full effect to be seen in services trade volumes.

The peculiarity of the Nigerian foreign exchange market needs to be highlighted. The country's foreign exchange earnings are more than 90 per cent dependent on crude oil export receipts. The result is that the volatility of the world oil market prices has a direct impact on the supply of foreign exchange. Moreover, the oil sector contributes more than 80 per cent of government revenue [7]. This is very evident in the economic situation of Nigeria today where the fall in the global oil price has led to a greater devaluation of the naira considering the fact that Nigerians main export commodity is oil hence, giving an insight into the relationship between trade volume and exchange rate. Thus Sanusi (2004), [7], opined that a strong naira will make imports cheaper but we must appreciate that the consequence of such a policy is the failure of our domestic economy to create wealth and generate employment for our youths. The right exchange rate, therefore, is the one that facilitates the

optimal performance of the Nigerian economy as a part of the new integrated global village and help Nigeria to produce more, import less, export more and buy more Nigerian goods.

Some researchers focused on exchange rate and its responses to economic growth. For example, [8, 9 and 10], studied the effects of exchange rate on economic growth. In the same vein Nicita (2013), [4], studied exchange rate, international trade and trade policies, while Aubion and Ruta (2011), [11], studied the relationship between exchange rate and international trade. None of these studies explicitly investigated the responsiveness of exchange rate to trade volume, thereby creating a gap. This study therefore becomes necessary to fill the gap as it is aimed at investigating the responsiveness of exchange rate to trade volume in Nigeria.

This study therefore as its broad objective, contributes to understanding the relationship between exchange rates and international trade by evaluating the degree of responsiveness of exchange rate to trade volume. The review, therefore, abstracts from other important factors that may have a more or less direct bearing on the relationship between exchange rates and trade, such as the factors behind the determination of exchange rates, the impact of exchange rate regimes on the economy, or the relationship between exchange rate policies and global imbalances.

METHODOLOGY

The study adopted *ex-post facto* research survey design. The data used are mainly annual time series data extracted from the Statistical Bulletin of Central Bank of Nigeria 2015 covering a thirty year period from 1986 to 2015. A combination of descriptive statistics, covariance test, correlation and regression were employed in carrying out the necessary preliminary and diagnostic tests. Augmented Dickey Fuller (ADF) test was used for unit root test. The design adopted is used to evaluate the relationship between exchange rate and trade volume in Nigeria. The researcher also made use of correlation coefficient analysis to measure the magnitude of the relationship that exists between exchange rate and

trade volume in Nigeria. The impact of trade volume on exchange rate was measured using the regression analysis.

MODEL SPECIFICATION

Classical Linear Regression Model was adopted in this study. The model aims at investigating the responsiveness of exchange rate to trade volume. An auto regressive function of the dependent variable was introduced as one of the regressors to make the model dynamic and to eliminate auto correlation.

$$\text{Log EXR} = \beta_0 + \beta_1 \log \text{IMPT}_t + \beta_2 \log \text{EXPT}_t + \beta_3 \log \text{EXR}_{t-1} + \mu_t$$

Where:

EXR = Exchange Rate

IMPT = Import

EXPT = Export

$\beta_0 = \text{Intercept}$ of the regression equation

β_1, β_2 = coefficient of the parameter estimates

μ = error term

t = time period

Apriori Expectation = $\beta_1, \beta_2 < 0$

ANALYSIS AND PRESENTATION OF DATA

Table 1 Basic Descriptive Statistics of the Variables of Interest

	LEXR	LEXPT	LIMPT	LGEXR
Mean	4.921710	8.767403	8.336250	135.2985
Median	4.889010	9.000604	8.440386	132.1470
Std. Dev.	0.160687	0.755696	0.833017	18.10088
Skewness	0.173445	-0.741944	-0.257046	-0.147922
Kurtosis	2.703023	2.144820	1.664381	1.865599
Jarque-Bera	0.139019	1.955504	1.365445	0.858994
Probability	0.932851	0.376156	0.505239	0.650836
Observations	16	16	16	16

Source:
Authors'

computation (2016)

Table 1 shows the basic descriptive statistics of the variables under study. It shows measures of central tendency like the mean and median which measures how closely knit the variables are. It also contains measures of spread and variation such as the standard deviation. The test for normality is shown by Skewness and kurtosis with Jacque Berra which is asymptotic combined test for an S(0), K(3) were also shown in the table. These measures the degree of symmetry and peskiness of the observation respectively.S

TABLE 2: CORRELATION ANALYSIS

	LEXR	LEXPT	LIMPT	LGEXR
LEXR	1.000000	0.637966	0.823332	0.851406
LEXPT	0.637966	1.000000	0.905042	0.824366
LIMPT	0.823332	0.905042	1.000000	0.881075
LGEXR	0.851406	0.823466	0.881075	1.000000

Source: Authors' computation (2016)

Table 2 contains the correlation analysis of the variables under study. The result indicates that all the variably positively and significantly

correlate with one another with varied percentages. However, the strength of the linear association between EXPT and IMPT is about 91% and the strongest. This implies that IMPT is stronger in association with EXPT than the other variables under study. EXR shows a stronger association with IMPT than with EXPT considering their percentage degree of relationship of 82% and 63% respectively.

Unit Root Test

Unit Root Test which shows the Stationary properties of the series is shown in this sections. This is necessary to avoid spurious regression. The Augmented Dickey Fuller (ADF) procedure following the form formulated by Dickey and Fuller was adopted in testing for existence of unit root in the time series data, as well as the order of integration of the variables.

Table 3 Summary of the Augmented Dickey Fuller (ADF) Unit Root Test

VARIABLE	ADF STATISTIC	CRITICAL VALUE @ 5%	P VALUE	ORDER OF INTEGRATION	REMARKS
LEXR	-5.18	-3.83	0.0065	1(1)	Stationary at 1st differencing
LEXPT	-2.13	-1.97	0.0364	1(1)	Stationary at 1 st differencing
LIMPT	-4.97	-1.97	0.0001	1(1)	Stationary at 1st differencing
LGEXR	-3.41	-1.97	0.0025	1(1)	Stationary at 1 st differencing

Source: Authors' computation (2016-12-10)

Table 3 shows the test for stationarity properties of the series following the Augmented Dickey Fuller statistics. LEXPT and LGEXR were found to

be stationary at order 1 while LEXR and LIMPT became stationary at order 2. At the first and second difference as reported, the ADF statistics for the respective variables were more negative than the critical values at 5% level of significance. The reported p-values are less than 0.05. Hence, the null hypothesis of the presence of unit root in all the variables is convincingly rejected.

TABLE 4 REGRESSION ANALYSIS / MODEL ESTIMATION RESULTS

Log EXR	=	$\beta_0 + \beta_1 \log \text{IMPT}_t - \beta_2 \log \text{EXPT}_t + \beta_3 \log \text{EXR}_{t-1} + \mu_t$
Log EXR	=	$1.49 + 0.18 \log \text{IMPT}_t - 0.15 \log \text{EXPT}_t + \beta_3 \log \text{EXR}_{t-1} + \mu_t$
t- stat	=	(2.94) (-2.68)
std Error	=	0.06 0.06
P. value of t	=	0.01 0.02
$R^2 = 0.88,$	$F = 28.12,$	$DW = 2.47$

From **table 4** above, LOG (EXR (-1)) was used as control variable. L IMPT shows positive and significant impact on LEXR while LEXPT indicates a negative and significant impact on LEXR. The R^2 reveals that about 87% of the variations in EXR could be explained by EXPT and IMPT while about 13% (unexplained variation) is blamed on other factors capable of influencing exchange rate (EXR) that are outside the model. The F-statistics of **(28.177732 P-value = 0.0000010)** at a critical value of 0.05 shows that the overall regression is significant and can be used for meaningful analyses. There is no evidence of a first order serial autocorrelation AR (1) considering the Durbin Watson statistics (DW) value of **2.47**. By rule of thumb, if the DW statistics is approximately equal to 2, it is evidence against the existence of a first order serial correlation.

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The purpose of this study is to evaluate the responsiveness of exchange rate to trade volume in Nigeria. Literatures and academic journals on exchange rate and trade volume were reviewed in the course of the study. Descriptive statistics and other preliminary tests were carried out on the variables. The research methodology concentrated on the use of the

ordinary least square regression method. Log of Import (LIMPT) proved to be a positive and significant function of exchange rate (EXR) while Log of Export (LEXPT) proved to be a negative and non-significant function of Exchange Rate (EXR). Hence, the paper concludes that there is a positive and significant relationship between import and exchange rate in Nigeria during the period under review. While a negative and non-significant relationship exists between export and exchange rate in the periods reviewed.

This is in line with our a priori expectation and the balance of payment theory which states that a large currency account deficit (more imports than export) will result in the domestic currency depreciating (high exchange rate). On the other hand, a surplus (more export than import) is likely going to cause currency appreciation (low exchange rate). This goes to show that an import dependency driven economy like Nigeria experiences currency devaluation and high exchange rate, hence, increased import expenses, while the reverse is the case for an exporting economy. This aligns with Nigeria's position which over the years has experienced large balance of payment deficit with its attendant depreciation in currency value and consequential import overriding exportation.

The paper then issued a strong recommendation and advocacy for the government to endeavour to improve on its production base as to increase exports for increased foreign exchange reserves. In other words the Federal Government of Nigeria should formulate, implement and encourage dynamic macroeconomic policies that would be favourable enough for attracting capital inflows through foreign direct investments for improved productivity of the country for increased exports. Once the nation's exports increase, there will be enough foreign exchange reserves and the value of our naira will appreciate against other strong currencies of other economies.

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