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RESEARCH ARTICLE

Responsiveness of Macroeconomic Variables to Currency Devaluation in Nigeria

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ABSTRACT

This study examined the responsiveness of macroeconomic variables to currency devaluation in Nigeria within the period of study. However, the specific objectives include, Examine the impact of currency devaluation on the real gross domestic product (RGDP) and as well ascertaining the influence of currency devaluation on interest rate in Nigeria. The study fully embarks on secondary data therefore, an ex-post facto design was adopted for the study. The data was drawn from the Statistical Bulletin of the Central Bank of Nigeria (CBN), Statistical Bulletin, National Bureau of Statistics (NBS), and Debt Management Office (DMO). The data are set from 1986 to 2018 (33-years) period. An Econometric data analysis technique was used to analyze the data. that currency devaluation has a negative impact on real gross domestic product in Nigeria as was explained by the negative coefficient value (-0.244422) of our explanatory variable and the corresponding probability value 0.0124 < 0.05. It implies that Currency devaluation had a negative and significant impact on real gross domestic product (RGDP) in Nigeria. While Currency devaluation has a negative but no significant influence on interest rate in Nigeria. It was observed that the coefficient of (-1.212822) for currency devaluation is negative, hence indicative of a negative effect on the explanatory variable. But the t-Statistics of - 2.001147< 2 and the probability value of 0.0632 > 0.05, indicated that there is no significant effect. Based on the finding, we hereby concluded that currency devaluation responses to the real gross domestic product, is negative as well as significant and it also responds negatively to interest rate as well as insignificant within the period of the study. We recommended that; Currency devaluation should be discouraged in an import-driven economy like Nigeria as it precipitates negative effects on economic growth. And to encourage the growth of the real domestic product, the government should step up policy to spur the domestic industry to produce enough for exportation which will go a long way to boost the economy by the improved favorable interest rate.

Keywords: *Macroeconomic Variables, Currency Devaluation, Nigeria*

1. Introduction

Most often, the purpose of nations devaluing their currency is to raise the relative price of foreign goods so that the prices of local goods would be reduced. The economic logic behind this action is to make sure that imported goods are expensive thereby swaying domestic residents from buying foreign goods into buying locally made goods. To support this assertion, Ahmad and Pentecost (2017) assert that there is no doubt that initially, a common man in Nigeria would not enjoy naira devaluation because the policy is channeled towards encouraging exportation and discouraging importation.

It was noted by Moore (2012) that the International Monetary Fund (IMF) allows countries to devalue their currency to correct "fundamental disequilibrium" in their balances of payments. In Nigeria's case, Kenneth (2014) opined that several factors prevent our country Nigeria from benefiting from her currency devaluation since its inception in 1973. Such factors among others include the fact that Nigeria is an import-driven economy as well as being a mono-economy. Nigeria as we all know imports more than she exports and she over relies on the exportation of oil majorly. These have been affecting our naira exchange rate negatively, hence a continuous search for a relatively stable exchange rate regime to remedy the situation and this led to the idea of devaluating our currency first in 1973.

Since then, there has been a series devaluation of our naira and much has been said about the outcomes of this move on the macroeconomics variables. In other words, the devaluation saga either affects some of the key macroeconomic variables positively and significantly or negatively. There are so many conflicts of interests, supporters, and critics of further devaluation of naira; hence there is a need for resolution as per its impact on the key macroeconomic variables

Interest Rate as another variable of focus in this work is the amount that a bank charges on the amount it lends to borrowers. It is the rate at which commercial banks make funds available to people who need the fund for investment. Lending rates vary in accordance with the nature of loans and their purpose. For instance, a development loan attracts less interest rate than a commercial or business purpose loan.

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Statement of the Problem

Currency devaluation as a policy instrument has been used in several countries both developing and developed to solve one economic imbalance or the other. But unfortunately, the results have never been the same. The decision taken by Monetary Policy Committee in November 2014 on naira devaluation has generated a lot of arguments both for and against its workability on an import-driven economy like Nigeria. Renowned economists in the country have not had any consensus on the impact of currency devaluation on the economy. Hence, this work is to empirically examine the responses of the key macroeconomic variables to currency devaluation in Nigeria. In other words, on account of these shortfalls, this study is poised to examine empirically how key macroeconomic variables in Nigeria have responded to the continuous currency devaluation, starting from the period of introduction of the Structural Adjustment Programme (SAP) in 1986 to 2018.

Objectives of the Study

The broad objective of this study was to examine the responsiveness of the key selected macroeconomic variables to currency devaluation in Nigeria within the period of study. However, the specific objectives include to:

1. Examine the impact of currency devaluation on the real gross domestic product (RGDP) in Nigeria.
2. Ascertain the influence of currency devaluation on interest rates in Nigeria.

Statement of Hypotheses

The following hypotheses were formulated in null forms thus:

1. H_{01}: Currency devaluation did not positively and significantly impact the real gross domestic product (RGDP) in Nigeria.
2. H_{02}: Currency devaluation did not have a positive and significant influence on the interest rate in Nigeria.

2. Review of Related Literature

2.1 Conceptual Review

Currency Devaluation

The term devaluation is not a new concept and should not be seen as an outlandish and terrible expression or terminology. It simply is a permissible method of fixing the exchange value of a currency in light of the new supply and demand reality (Shapiro, 1988). Momodu and Akani (2015) described the concept of devaluation as a deliberate reduction in the value of the currency in a particular nation concerning other currencies of nations partaking in international trade within the framework of the fixed exchange rate to boost growth. This is a deliberate reduction in the value of the currency in a particular nation concerning currencies of other nations. A concept that is choosey related to devaluation and which is sometimes confused with the devaluation of currency is depreciation. Depreciation and devaluation are sometimes incorrectly used interchangeably although they both refer to values in terms of other currencies. Depreciation simply means a decrease in the price or value of a commodity. Depreciation is the falling of exchange values of a currency for other foreign currencies as a result of the forces of demand and supply which may be temporary (Okonkwo, 2016). According to him, much has been achieved as such a move has affected some of the key macroeconomic variables positively and significantly. For instance, the record of between the first quarter of 2013 and the last quarter of 2014 Nigeria posted an average GDP growth rate of 5.8%, a favorable balance of payment, single-digit inflation of 8.2% in the last quarter of 2014, etc, a sequel to naira devaluation during these periods.

According to Okoye and Orji (2016) the favorable situation could not last long, everything seemed to have gotten back to square one, hence the dilemma of what next, either to continue or not. To support this notion, Nzotta (2017) noted that the Nigerian government, in the year 2016, was once in a dilemma of what will be the effect of further devaluation of the naira. There are so many conflicts of interests, supporters, and critics of further devaluation of naira; hence there is a need for resolution. Though currency devaluation and depreciation are different terminologies they originate from the same source of economic policy (Alemu and Jin-sang, 2014). In his description of the term devaluation, Brown (2015) takes devaluation to mean the official intentional lowering of the value of a country's currency relative to other foreign currencies.

Economic Growth

Economic growth is described by Osundina and Osundina (2016) as the increase in the market value of the goods and services produced by an economy over time. In other words, Economic Growth is described as the increase in the market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product or real GDP. Real Gross Domestic Product is reoffered to as the adjusted total worth of goods and services produced in any economy in a year, including net income from investment overseas.

In Nigeria, between 1960 and 1970, GDP recorded 3.1 percent growth annually as driven by the agricultural sector, between 1970 and 1980 which is the oil boom era; Nigeria recorded a remarkable increase in GDP of 6.3 percent annually. In the early 1980s, the growth rate reduced but from 1986, as a result of structural adjustment and economic reform, there was an improvement because GDP increased at the rate of 4 percent. Nigeria's GDP was recently rebased with the result placing the country as Africa's largest economy with an annual GDP of $510 billion (Osundina and Osundina, 2016). They explained that Nigeria's population and the size of the market have remained an attraction for FDI inflow with the current population estimate projected at 183 million people in 2015 (growing at a projected growth rate of 2.82%). The country is currently ranked the 7th most populous country in the world and has enjoyed a positive GDP growth rate in the last 10 years and a relatively stable exchange rate regime. To buttress this assertion, Taiwo (2017) noted that the GDP in Nigeria averaged 1.32 percent between 2013 and 2015. The highest growth rate was achieved in the third quarter of 2015 which was 9.19 percent. The services sector is the largest sector of the economy accounting for 50 percent of the GDP. While the fastest segment is information and communication, the agricultural sector, which used to be the biggest sector with high potential for employment, accounts for 26 percent and the oil sector accounts for just 11 percent.

Interest Rate

This is the amount that a bank charges on the amount it lends. It is the rate at which commercial banks make funds available to people. Lending rates vary depending upon the nature of loans and advances. The rates also vary according to the purpose in view. For example, if the loan is sanctioned for activities for the development of backward areas, the rate of interest is relatively lower as against loans and advances for commercial/business purposes. Similarly, for smaller amounts of loans, the rate of interest is higher as compared to larger amounts.

Again, lending rates for consumer durables, example loans for the purchase of two-wheelers, cars, refrigerators, etc. are relatively higher than for commercial borrowings. The impact of real interest rates on exchange rate vis-à-vis private investment was first formalized in an investment equation by Jorgenson (1971), who derived the desired stock of capital as a function of real output and the opportunity cost of capital. In his approach, known as the neoclassical approach, a representative firm maximizes the present value of its future cash flows through exchange rate appreciation. The desired capital stock is directly related to output and inversely related to the exchange rate.

2.2 Theoretical Framework

Classical Approach Theory

According to Tejvan (2008), the classical approach theory postulates that currency devaluation could remedy the trade deficit that entails domestic expenditure as imported goods tend to become more expensive than domestic products, and domestic products will be cheaper abroad. Hence, these shifts contribute to reducing the domestic assumption and hence could ease the trade deficit. According to him, it is expected that devaluation would lead to improvement in the trade balance in the long run. Currency devaluation may affect a country negatively in the short-run but will increase the value of that country's currency in the long-run. From literature, it is discovered that other countries that have devalued their currency have a diversifiable economy but as for Nigeria, we are operating a mono-sectorial economy, **(**Tejvan 2008)**.** It is a known fact that exchange rate devaluation affects economic activities. This has been backed up by different works of literature and theories that there is a relationship between currency devaluation on macroeconomic variables (Paul, 2006).

Standard Trade Theory

The elasticity approach was propounded by Robinson (1947) and Meltzer (1948) and popularized by Krueger (1983). This theory postulates that transactions under contract completed during the period of devaluation may affect the trade balance negatively in the short run but over time exports and imports quantities adjust. In other words, standard trade theory which states that the exchange rate can affect the economy´s imports and exports provided enough evidence that a fluctuation in the exchange rate affects both the value and volume of trade. Accordingly, if the real exchange rate rises for the home country, if there is a real depreciation, the households in the domestic country can get fewer foreign goods and services in exchange for a unit of domestic goods and services. When this happens, a unit of foreign goods would give more domestic goods, resulting in domestic households buying less foreign goods and foreign households wanting to purchase relatively more domestic goods. The higher the real exchange rate the more surplus in the net exports the country will obtain. This theory was propounded by Lerner in 1944 (Zhang, 2008).

2.3 Empirical Review

Williams (2016) noted that the implication of currency devaluation has led to a large body of literature examining the question of whether economies with the devaluation of the currency had been impacted positively and significantly using some of the major economic performance indicators as yardsticks. Hence, there are several empirical studies with a focus on the implications of currency devaluation on the economies of both developed and emerging nations. In other words, there have been numerous empirical studies on the influence of currency devaluation on economic growth, especially in emerging economies. Unfortunately, results and evidence about the effect of exchange rate devaluation differ by country (region), the analytical method employed, and the state of the economy, whether import-driven or reversal. In this note let's see and discuss some of such empirical studies.

Lencho (2013) empirically studied the effect of Exchange Rate Devaluation on Trade Balance in Ethiopia, covering the study period between 2000 and 2012. He employed a combination of ordinary least square (OLS) and vector error correlation (VEC) models in analyzing the data. The result of his analysis revealed that exchange rate devaluation in Ethiopia only influences the balance of payment and external reserve positively and no influence of it was found on inflation, employment, and interest rates.

Teru and Usman (2017) examined on Impact and implications on the Nigerian economy Naira devaluation. The main thrust of this study was to examine the impact and implication of the 'continued' naira devaluation on the Nigerian economy from 1970-to 2014. Data for the variables used were collected from the CBN statistical bulletin as well as from the database of the National Bureau of Statistics. Data collected were analyzed and tested using the ordinary least square (OLS) technique but due to the fact that data are not stationary, a unit root test was employed; it further resorted to granger-causality test in order to test and prove that the variables do not have a causal relationship between each other, after which Error Correction Model was also used. From our findings, we discovered that a decrease in the exchange rate value of the naira retards investment in Nigeria, while imports as well as export affects the GDP negatively because of the lack of diversification in the Nigerian economy and subsequently affect economic growth. It was recommended that the government should focus on diversification, as well as expand technical knowledge and innovations emanating from Nigerians by providing necessary assistance among several other recommendations. This paper concluded that devaluation cannot improve the trade balance in the Nigerian economy. Devaluation can only benefit countries that are originally export-based before the devaluation of a currency. For an economy that is structured like that of Nigeria, devaluation will surely complicate the problem at hand, rather than solve it.

Okoyeuzu, Igwe, and Ukpere (2018) investigated currency devaluation and the economic implications for Nigeria. The decision of the Chinese government to devalue the Yuan has attracted serious condemnation by majorly developed economies, despite the government's position that the devaluation was aimed at aligning the Yuan with the market rate. The general argument is anchored on the notion that the devaluation was a strategy to increase China's share of global trade by making its goods cheaper in the international market. This thinking is influenced by the long-standing Mundell–Fleming model, which is aligned with the theory that competitive devaluation is detrimental to the world economy, because of the beggar-thy-neighbor welfare effect. The situation is compelling other countries to respond by improving their balance of trade in response to China's tactics. The inability of developing economies to respond to this global trade war could be attributed to factors such as colonialism, the presence of agency of restraints, complementarity among developing countries, and other institutional rigidities such as technological deficiency, infrastructure deficit, and commodity-based exports, among others. Chinese currency devaluation has impacted meaningfully on Nigeria's economy given the fact that Nigeria maintains strong economic ties with China. The paper argues that for developing economies to effectively respond to competitive devaluation, they must close their borders to certain goods, improve infrastructure, prioritize technological transfer, embrace value-added production, and eliminate institution rigidities that hinder the ease of doing business.

3. Methodology

This study adopted the *Ex-post facto* design on the premise that the study depends on phenomena that had already been recorded, therefore, are beyond the manipulation of the researcher. This implies that the relevant explained and explanatory variables used for the analysis cannot be manipulated by the researcher in any form (Onwumere, 2005). Hence, the researcher was expected to make use of the relevant data as collated by the institutionalized agencies charged with such statutory tasks. The researcher concentrated on the responsiveness of currency devaluation proxied by the exchange rate (dependent variable) to some macroeconomic variables namely; real gross domestic product and interest rate (independents variables) in Nigeria from 1986 to 2018. The data was drawn from the Statistical Bulletin of the Central Bank of Nigeria (CBN), Statistical Bulletin, National Bureau of Statistics (NBS), and Debt Management Office (DMO). The data are set from 1986 to 2018 (33-years) period. Figures for exchange rates and other macroeconomic variables were collected from the CBN of Nigeria Annual Reports and Statement of Accounts. The data was purely a time series which are observations that are ordered in time or numerical values of variables from time to time. The study focused on the Nigerian Economy. Econometric data analysis techniques were used to analyze the data.

Model Specification

This study ascertained the effectiveness of currency devaluation on key selected macroeconomic variables, spanning from 1986 to 2018, and using data from Nigeria. The econometric model employed by this study was derived from the current work of Lee et al (2006) cited in the Uremandu et al (2016) in which output of an economy was represented (symbolized) by the aggregate production function shown thus:

This study employed the endogenous growth model in which a variable is endogenously determined by economic factors. In this study, the study used five key selected macroeconomic variables - real gross domestic product, interest rate, and inflation rate, the balance of payment, and foreign reserves of Nigeria as independent variables. Currency devaluation proxied by the exchange rate is the dependent variable. Therefore, given the objectives of this study, the functional relationship between the variables is specified in the modified model as shown thus:

DEXR = ƒ (RGDP, INTR,) ……..... (1)

Rewriting the above econometric models to regression models, we have:

$DEXR_t = a_0+\beta_1 RGDP_t+\beta_2 INTR_{tt}+.... \mu_t$……. (2)

Where:

DEXR = Currency Devaluation proxy by Exchange Rate (explained variable).

RGDP = Real Gross Domestic Product (explanatory variable).

INTR = Interest Rate (explanatory variable)

β_1- β_5 = Coefficients

t = Time Series

μ . = Error Term

a_0 = constant term

A priori: $a_1>0$, $a_2>0$,

It was estimated that other variables may explain the behavior of currency devaluation; therefore, the error term is introduced to capture them.

Equation (2) can functionally arrest the impact of currency devaluation on the real gross domestic product (RGDP) in Nigeria; the essential variables are tailored in on the LRM and log-transformed to ensure linearity. In other words, the equation can be specified in a log form to bring the variables in a common base as shown thus:

$LogDEXR_t = a_0+\beta_1 logRGDP_t+\beta_4 logINTR_t+_t$…… (3)

We modified equation (3) to derive a Vector Autoregressive (VAR) model with a period lag for each of the variables as shown:

$LogDEXR_t = a_0+\beta_1 logRGDP_{t\,(-1)} +) +\beta_4 logINTR_{t\,(-1)} +\mu_{t\,(-1)}$ ……. (4)

Where:

t (-1) is one period lag and logRGDP is log of real gross domestic product; and logINTR is log of interest rate. However, the models above were modified and used in proper estimation of the models for hypotheses one to five thus:

Hypothesis one (Model 1)

H_0: Currency devaluation did not have a positive and significant impact on real gross domestic product (RGDP) in Nigeria.

H_1: Currency devaluation has a positive and significant influence on real gross domestic product (RGDP) in Nigeria.

$DEXR = \beta 0 + \beta_1 RGDP_t + \beta_2 INTR_t + \mu_t$

Where:

DEXR = Devaluation proxied by Exchange Rate

RGDP = Real gross domestic product

Hypothesis two (Model 2)

H_0: Currency devaluation did not positively and significantly influence interest rate in Nigeria.

H_1: Currency devaluation did positively and significantly influence interest rate in Nigeria.

$DEXR = \beta 0 + \beta_1 RGDP_t + \beta_2 INTR_t + \mu_t$

Where:

DEXR = Exchange Rate devaluation

INTR = Interest Rate

4. Presentation of Data, Analysis, and Interpretation

Data Presentation
Table 4.1 below presents the annual time series raw data as relates to our study Objectives thus:

Table 4.1: Data Presentation, 1986 - 2018

Years	*EXR (NGR)*	*RGDP*	*INTR (%)*
1986	2.02	20,243.62	*11.6*
1987	4.02	24,943.91	*8.5*
1988	4.54	32,032.85	*6.6*
1989	7.39	41,919.64	*15.1*
1990	8.04	49,967.69	*13.9*
1991	9.91	59,604.47	*11.8*
1992	17.30	90,980.33	*10.30*
1993	22.05	1,259.07	*12.00*
1994	21.89	17,628.13	*8.40*
1995	21.89	28,952.01	*6.30*
1996	21.89	37,791.33	*9.00*
1997	21.89	41,116.41	*14.5*
1998	21.89	45,889.90	*16.5*
1999	92.69	53,073.62	*18.00*
2000	102.11	68,974.82	*13.50*
2001	111.94	81,341.42	*20.50*
2002	120.97	11,332.25	*16.50*
2003	129.36	13,301.56	*15.00*
2004	133.50	17,321.30	*15.00*
2005	132.15	22,269.98	*13.00*
2006	128.65	28,662.47	*10.00*
2007	125.83	32,995.38	*9.50*
2008	118.57	39,157.88	*9.75*

2009	148.88	44,285.56	*6.00*
2010	150.30	54,612.26	*6.25*
2011	153.86	62,980.40	*12.00*
2012	157.50	71,713.94	*12.00*
2013	157.31	80,092.56	*12.00*
2014	158.55	89,043.62	*13.00*
2015	195.52	94,144.96	*11.00*
2016	305.00	101,489.5	*14.00*
2017	305.79	113,711.6	*14.00*
2018	306.08	28,720.25	*14.00*

Source: CBN Statistical Bulletin of Various Years

Where
EXR = Exchange Rate, RGDP = Real Gross Domestic Product, INTR = Interest rate.
These variables were log-transformed (processed) into the natural logarithm forms of the series. The transformation is to introduce evenness on the series so that the estimation would not be affected by extreme values.

Results and Analysis

Descriptive Statistics

Table 4.2 Basic Descriptive Statistics of the Panel Data Series of the Study

Option	Mean	Median	Std Dev	Skewness	Kurtosis	Jarque-Bera	Probability	Ob
LNEXR	318.22	2i2.88	416.216	0.98	2.34	5.22	0.07	32
LNRGDP	1742.55	7592.85	1738.322	0.68	1.88	4.42	0.06	32
LNINTR	12.54	12.100	3.632	0.523	2.15	2.45	0.02	32

Source: Authors' extract from E-views 9 output 2019

Where
***EXCHR = Exchange Rate,* RGDP = Real Gross Domestic Product, INTR = Interest rate.**

Table 4.2 presents the descriptive statistics of our panel dataset which shows the mean and standard deviation which are measures of central tendency as well as dispersion of the study variables. The table describes the individual characteristics of the proxied variables. The result revealed that the Log interest rate (LINTR) has the lowest mean value of 12.54. Additionally, the descriptive analysis was also furnished with Skewness and Kurtosis of all the variables of interest.

The skewness and kurtosis which measure the peakedness and symmetry of the series of the dataset respectively were carried out as shown in the table. The Skewness measures the symmetrical property of the histogram while the kurtosis measures the height and the tail shape of the histogram. The yardstick for measuring the Skewness is how closely the variable is to the zero (0) and for the kurtosis is how closely the variable is to the three (3).

We have three kinds of kurtosis, (I) Mesokurtic is when the value of kurtosis is exactly equal to three; (II) playkurtic is when it is lower than three and (III) leptokurtic when it is above three. For the kurtosis, the two variables (LNINTR and LNRGDP) can be regarded as playkurtic because they have values less than 3. It was only interest rate (LNINTR) that was equal to three which was Mesokurtic. From the normality test results presented in table 4.2, it was revealed

that the null hypothesis of a normal distribution is rejected for all the variables used in this study because they all have a Jarque-Bera statistic with a probability of less than 5%. As already stated, the result of skewness and Kurtosis which measures the degree of departure and peak ends of a distribution respectively shows that the study variables with exception of exchange rate are positively skewed with excess kurtosis. These indicate a departure from normality.

Unit Root Test

The rule of thumb for unit root tests is that t-statistics must be greater than the critical values for stationarity to be attained. This could be realized at level 'I (0)' or at 1st difference 'I (1)' of the data. But we realized ours at 1st difference of the data series as can be seen in table 4.3 under. This study adopted the quantitative method of data analysis. Here, the Augmented Dickey-Fuller (ADF) test was conducted for stationarity to determine the order of integration as well as satisfying the economic theory which says certain variables must be integrated, random walk or martingale process. It was noted in the empirical literature that time series data are characteristically found to be spurious (unreliable) particularly if the data are not stationary. Thus, in order to get rid of this abnormality, the unit root test was conducted on each of the variables studied to determine their stationary attributes. Evidence suggests that if time series data are not stationary, all the emerging regression results will, at best, provide spurious regression and, at worst, very misleading. Consequently, the outcome of the unit root test facilitated Augmented Dickey-Fuller (ADF) test which was carried out as presented in Table 4.3

Table 4.3: Results of Augmented Dickey-Fuller Unit Root Tests

Test Variables	ADF Statistic	Critical Values (5%)	P-value	Order of Integration
RGDP	-5.637486	-2.564534	0.0000	I(1)
EXR	-7.734524	-2.564534	0.0000	I(1)
INTR	-4.365209	-2.645372	0.0000	I(1)
INFR	-6.180094	-2.645372	0.0000	I(1)
BOP	-4.355422	-2.665463	0.0001	I(1)
FRV	-5.309863	-2.565543	0.0000	I(1)

Source: Researcher's extract from the E- Views 9 output 2019

Where

***EXCHR = Exchange Rate,* RGDP = Real Gross Domestic Product, and INTR = Interest rate.**

As shown in Table 4.3, the unit root test for stationarity was conducted adopting the Augmented Dickey-Fuller approach. The summary of the results of the Unit Root Tests of the stationarity revealed that our variables are stationary at the same orders of integration. Each of the variables has no unit root, hence attained stationarity after first differencing I(1). It is evident that the calculated values (ADF Statistic) are less than the critical values for each of the variables tested, which is proof of their stationarity at a 5% level of significance.

Cointegration Test

Following our result in table 4.3 which revealed that all our variables attained stationarity after 1st differencing, a cointegration test was conducted to ascertain if the time series variables have a long-term or equilibrium relationship among them. The Johansen and Juselius cointegration test were performed to ascertain whether the variables under study have a long-run equilibrium relationship. The cointegration test result based on maximum eigenvalue statistics showed that there is one cointegrating equation at a 5% level in the model.

The cointegrating equation is as shown below in table 4.4

Table 4.4 Summary of Results of Residual and Stability Analysis of Cointegration

R^2	F-Stat.	DW	BG-F	Prob.value	RESET-F
0.74	62.48	0.20	9.02	0.002	0.06

Sources: Researcher's extract from E-views version 9

The high R^2value of 0.74 (74%) in table 4.4 is indicative that the explanatory variables could explain more than 74% of the total variations in the response variables. This implies that the model is very good for the dataset. The F-statistic value of 62.48 and the corresponding probability value of 0.002 indicated that the overall regression is statistically significant and can be used for meaningful analyses. The Durbin Watson Statistics of 0.20, wipes out any suspicion for the possible existence of a first-order positive autocorrelation in the model. Hence, there is no need for a higher-order serial correlation test. The Breusch-Godfrey LM Serial Correlation Test was employed and the result of the F-stat. value of 9.02 and associated p-value of 0.06 rule out the existence of autocorrelation in the model.

Correlation Matrix

Table 4.5: Correlation Analysis Result

Variable Correlation t-Statistic probability	*LNDEXR*	*LNINTR*
LNDEXR	-	-
LNRGDP	*0.364315* *8.49624* *0.0000*	-
LNINTR	*-0.543235* *-3.882186* *0.0004*	*-0.538100* *-3.88043* *0.0005*

Source: Extracted from E-views version 10

Where
***EXCHR = Exchange Rate,* RGDP = Real Gross Domestic Product, and INTR = Interest rate**

From the result in table 4.5, it can be observed that all the series share bivariate positive and significant correlation with one another, and others share a negative and non-significant correlation with another. This is evidenced by the fact that their respective correlation coefficients are positive or negative and the probability values of the associated t-statistics respectively significant and non-significant by all being less than 0.05 while some are higher than 0.05.

Testing of Hypotheses

This section tested the hypotheses stated in chapter one and modeled in chapter three. Three steps were utilized in interpreting the Ordinary Least Square regression results. The steps involved first, restating the hypotheses in null and alternate forms; second, interpreting the regression results and thirdly, using the decision criteria to accept or reject the null/ alternate hypotheses. In other words, the hypotheses of the study are tested in this section of the study and were sequentially carried out as follows:

Test of Hypothesis One

In testing hypothesis one for this study, which is stated in modeled the following steps were taken:

1. Restating the hypotheses in both null and alternate forms
2. Decision Rules are specified
3. Presentation and analysis of the result
4. Taking a decision to accept or reject the/alternate hypothesis

Restating hypothesis one in null and alternate forms:

H_0: Currency devaluation had not positively and significantly impacted the real gross domestic product (RGDP) in Nigeria.

H_1: Currency devaluation had positively and significantly impacted the real gross domestic product (RGDP) in Nigeria.

Decision Rule

The decision rules are based on a 5% probability value and are stated as follows:

Reject the null hypothesis if p-value < 0.05 and accept the alternate hypothesis

Accept null hypothesis if p-value > 0.05, and reject alternate hypothesis

Table 4.6 Regression Result for the Test of Hypothesis One

Dependent Variable: LNRGDP				
Method: Least Squares				
Date: 11/11/21 Time: 16:14				
Sample: 1986 2018				
Included observations: 32				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LNDEXR	-0.244422	0.092419	-2.668817	0.0124
C	5.331772	1.065366	5.004637	0.0000
R-squared	0.981031	Mean dependent var		9.057203
Adjusted R-squared	0.978221	S.D. dependent var		2.014068
S.E. of regression	0.297230	Akaike info criterion		0.553977
Sum squared resid	2.385326	Schwarz criterion		0.782998
Log-likelihood	-3.863630	Hannan-Quinn criter.		0.629891
F-statistic	349.0991	Durbin-Watson stat		1.934155
Prob(F-statistic)	0.000000			

Source: Author's computation aided by E-views version 9, 2019

Where
LNDEXR =Log of devaluation proxied by exchange rate

Decision

The result revealed that currency devaluation *(LNDEXR)* has a negative impact on real gross domestic product *(LNRGDP)* in Nigeria as was explained by the negative coefficient value (-0.244422) of our explanatory variable LNRGDP and the corresponding probability value 0.0124< 0.05. This outcome is in contrast with our *apriori* expectation that (*LNEXR) positively* impact economic growth. Hence, we conclude that currency devaluation had a negative and significant impact on the real gross domestic product (RGDP) in Nigeria within the reference period of 1986-2018.

Test of Hypothesis Two

Hypothesis two seeks to determine if currency devaluation has a positive and significant influence on the interest rate in Nigeria. This hypothesis was tested using a 95% confidence interval.

Restating hypothesis two is null and alternate forms thus:

H_0: Currency devaluation did not have a positive and significant influence on the interest rate in Nigeria.

H_1: Currency devaluation has a positive and significant influence on the interest rate in Nigeria.

Decision Rule

Accept H_0 if the p-value > 0.05 otherwise, reject H_0 and accept H_1 accordingly.

Dependent Variable: LNINTR				
Method: Least Squares				
Date: 11/11/21 Time: 16:14				
Sample (adjusted): 1986 2018 Included observations: 32 after adjustments **Result** **Table 4.7 Regression Result for Test of Hypothesis two**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LNDEXR	-1.212822	0.918305	2.00221	-0.0632
C	-0.007584	0.019601	-0.386896	0.7020
R-squared	0.142926	Mean dependent var		-0.004748
Adjusted R-squared	0.044033	S.D. dependent var		0.080314
S.E. of regression	0.078526	Akaike info criterion		-2.127209
Sum squared resid	0.160324	Schwarz criterion		-1.940383
Log-likelihood	35.90814	Hannan-Quinn criteria.		-2.067442
F-statistic	7.445253	Durbin-Watson stat		2.468355
Prob(F-statistic)	0.052440			

Source: Author's computation aided by Eviews 9, 2019

Decision

From the result in table 4.7, it was observed that the coefficient of -1.212822 for currency devaluation (LNDEXR) is negative, hence indicative of a negative effect on the explanatory variable (LNINTR). But the t-Statistics of -2.00221 < 2 and the probability value of -0.0632 <0.05, indicate that there is no significant effect. Hence, based on the decision rule which says accept H_0 if the probability value > 0.05 otherwise, reject H_0 and accept H_1 accordingly, we accepted H_0 and rejected H_1. Therefore, we concluded that currency devaluation has a negative but non-significant influence on the interest rate in Nigeria.

Result

Covariance Analysis: *Correlation Matrix* Ordinary		
Date: 11/11/19 Time: 16:14		
Sample: 19862018		
Included observations: 32 ***Table 4.8 Correlation Matrix Result***		
Correlation		
t-Statistic		
Probability	LNDEXR	LNINTR
LNDEXR	1.000000	
LNRGDP	0.662425	
	11.56344	
	0.0000	
LNINTR	-0.543235	1.000000

	-3.662163	-----
	0.0004	1.002345

Source: Author's computation aided by EViews 9, 2019

Decision

The results in table 4.8 showed that all the variables except interest rate (LNINTR) share a bivariate positive and significant correlation with currency devaluation. This is evidenced by the fact that their respective correlation coefficients are positive and the probability values of the associated t-statistics are respectively significant as all of them with the exception of interest rate with a negative sign (-0.543235) are more than 0.05 critical values and equally above 2.5% which is the baseline. By the rule of thumb, we accept the alternate hypothesis; hence conclude that there is a positive and significant linear association (correlation) between currency devaluation and balance of payment in Nigeria.

Discussion of Findings

The results presented in table 4.6 (outcome of hypothesis one) means that currency devaluation *(LNDEXR)* has a negative impact on real gross domestic product *(LNRGDP)* in Nigeria as was explained by the negative coefficient value (-0.244422) of our explanatory variable LNRGDP and the corresponding probability value 0.0124 < 0.05. Currency devaluation (DEXR) measured by real gross domestic product which constitutes the major independent variables of our model exerted a negative effect (i.e., a negative coefficient value of -0.25) and a significant effect (0.012 < 0.05) on the real gross domestic product (RGDP). This implies that a 1% increase in DEXR brought about 25 units to a decrease in *RGDP.* The economic implication of this statistical outcome is that DEXR*,* as one of the modern monetary policies of government to manage her foreign exchange to improve on the value of naira did not make any notable contributions to the economy over the sample period. It could be that the exports base of Nigeria is not encouraging as the economy is more import-driven than otherwise. DEXR is expected to boost the country's capacity utilization for increased national productivity, as well as increased foreign exchange revenue, but *it* failed to achieve its target over the reference period.

From the result in table 4.7, (outcome of hypothesis two) it was observed that the coefficient of (-1.212822) for currency devaluation (LNDEXR) is negative, hence indicative of a negative effect on the explanatory variable (LNINTR). But the t-Statistics of - 2.001147< 2 and the probability value of 0.0632 > 0.05, indicated that there is no significant effect. Hence, based on the decision rule which says accept H_0 if the probability value > 0.05 otherwise, reject H_0 and accept H_1 accordingly, we accepted H_0 and rejected H_1. Therefore, we concluded that currency devaluation has a negative but non-significant influence on the interest rate in Nigeria. This could be as a result of the high-interest rate attached to loans and advances in Nigeria which is not encouraging both local manufacturers and foreign investors.

5. Summary of Findings

The findings arising from this study are summarized thus:

1. Currency devaluation had a negative and significant impact on real gross domestic product (RGDP) in Nigeria.
2. Currency devaluation has negative but no significant influence on interest rate in Nigeria

Conclusion

Based on the finding, we hereby concluded that currency devaluation responses to the real gross domestic product are negative as well as significant and it also responds negatively to interest rate as well as insignificant within the period of the study. The use of the devaluation of the currency as a monetary policy instrument of finance during the sample period did not undermine the stability of the Naira vis-a-vis the US Dollar and other foreign currencies. This practice of intentionally devaluing the currency of a nation to attempt to improve the value of such currency cum economic growth is affirmed worldwide.

Recommendations

On these notes, the work came out with the following recommendations:

1. Currency devaluation should be discouraged in an import-driven economy like Nigeria as it precipitates negative effects on economic growth. In that regard, the Federal Government should take concerted measures to control or possibly eradicate this life-threatening malady of importing even toothpick into our economy.
2. To encourage the growth of the real domestic product, the government should step up policy to spur the domestic industry to produce enough for exportation which will go a long way to boost the economy by the improved favorable interest rate.

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