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EFFECT OF EXCHANGE RATE, EXPORT AND IMPORT ON INFLATION IN NIGERIA

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Abstract
This study investigated the effect of exchange rate, export and import on inflation in Nigeria from 1970 to 2023 using Vector Error Correction Model (VECM) to determine the short run and long run impact of the parameters. Also, the variables were subjected to unit root tests using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP). The unit root results found that the variables were integrated of order one, I(1) while the Johansen Cointegration test revealed evidence of long run relationship between exchange rate and inflation. The Granger causality test also indicated the exchange rate influences effect on inflation in Nigeria. The VECM indicated that exchange rates have a pass-through effect on inflation in both the short run and long run, suggesting that the depreciation of the exchange rate over the years has driven inflation in Nigeria. Also, the study found that export lowers inflation while import drives inflation. Therefore, the study recommends that the monetary authorities are advised to embark on implementing a more flexible exchange rate regime that is capable of absorbing the external shocks on the domestic prices, government should promote exports by encouraging domestic production and import substitution to reduce reliance on imports and government should discourage imports especially on consumer goods by encourages firms that produce for exports.

Keywords: *exchange rate, pass-through, inflation, vector error correction and Nigeria*

1.0 Introduction

Inflation is the continuous rise in general price of goods and services in an economy. High inflation has a detrimental effect on overall growth, financial sector development, and vulnerable segments of the population. It also generates uncertainty, discourages savings, encourages consumption, threatens macroeconomic stability, and results in high social costs. This issue has posed a serious challenge to monetary authorities in Nigeria as it appears to have defied all measures. In Nigeria, inflation has been linked to exchange rate pass-through. Exchange rate pass-through (ERPT) refers to the extent to which changes in exchange rates are reflected in import prices, which then impact domestic inflation. Nigeria's heavy reliance on imports and its unstable exchange rate system makes ERPT a topic of interest in the country.

However, structurists economists are of the view that exchange rate depreciation has transmission effects on inflation (Choudhri & Hakura, 2006). Variation of exchange rate may directly or indirectly affect prices of imported goods (Volkan, Saatcioglu & Korap, 2007). On the one side, variation of domestic currency against the foreign currencies directly results in higher prices of imported goods. On the other hand, rise in the cost of production due to increase in price of imported inputs translate to increase in price of domestic goods. On the other hand, increase in the demand for net exports may also raises the domestic prices which results in inflation

Nigeria's economy is characterized by significant trade deficit, with imports accounting for a large proportion of its total merchandise trade. According to the World Bank (2020), imports constituted approximately 65% of Nigeria's total merchandise trade in 2019. This heavy dependence on imports makes Nigeria particularly susceptible to exchange rate fluctuations and their impact on inflation dynamics. Moreover, the volatility of Nigeria's exchange rate regime has contributed to persistent inflationary pressures. The exchange rate depreciation increases the domestic prices of imported goods which have contributed greatly to the rise in inflation level in the country. As the exchange rate depreciated in 1980s, the inflation rate rose from 9.97 percent in 1980 to 38.3 percent in 1988. It further increased from 40.9 percent in 1989 to 85 percent in 1995. In 2001, it fluctuated between 18.87 percent and 17.86 percent in 2005. It later declined to 8.48 percent in 2013, 8.06 percent in 2014 and slightly rose to 9.02 percent in 2015 but jumped to 17.2 percent in third quarter of 2021 and reached all time high at 24.66% in 2023 (Macrotrends, 2023).

To curtail the rising trends between exchange rate depreciation and inflation, policy makers have implemented several monetary policy measures aimed at stabilizing the exchange rate and reducing inflation (CBN, 2021). This witnessed the complete deregulation of exchange rate in 1995 through the introduction of Autonomous Foreign Exchange Market, reintroduction of Interbank Foreign Exchange Market, Retail and Wholesale Dutch Auction System, Retail Dutch Auction System and Interbank Foreign Exchange Market. However, these efforts have been hampered by external shocks such as fluctuations in global oil prices and capital outflows (Tule et al., 2020). As a result, Nigeria has experienced high inflation rates over the past few decades, with an average annual inflation rate of around 17% between 1996 and 2021 (World Bank, 2022). It is worrisome that these seem to have not yielded the desired result as both the exchange rate and inflation have continued to deteriorate; thereby giving an impression that exchange rate drives inflation in Nigeria.

Several studies have investigated the extent of ERPT in Nigeria. A study by (Abiodun et al 2016) found that there was a high degree of pass-through from exchange rate changes to import prices in Nigeria. The study estimated that a 1% depreciation of the Nigerian Naira led to an increase of about 1.3% in import prices. Another study, Musa (2021) posited that exchange rate movements have a significant impact on inflation dynamics in Nigeria through their effect on import prices. In addition, there are empirical evidences which further highlighted the debilitating effects of exchange rate variation on the overall economy. According to Gokhale and Raju (2013), depreciation of real exchange rate worsens inflation. Depreciation of domestic currency may deteriorate growth through different channels like, investment, interest rate, and external debt. It may harm investment in non-tradable items since most of the developing countries import inputs for product industry which increases cost of production (Branson, 1986). Depreciation increases nominal interest rate (Wijnbergen, 1986) because price increase, resulting from depreciation, will raise demands for nominal money and thus nominal interest rate. The increase in interest rate will tend to reduce investment and consumption expenditure (Munir & Aslam 2007). Depreciation increases the volume of external debt since most developing countries pay this debt in the form of foreign currency, which obviously needs larger volume of domestic currency after depreciation (Wijnbergen, 1986). Also, depreciation increases cost of production, which also decreases the volume of imported goods used for further production.

Literature Review

The Mundell-Fleming model was developed in early 1960s to incorporate monetary and fiscal policies in analysis of aggregate demand in an open economy or international trade. It is also referred to IS-LM model or Keynesian open economy model. It relates the role of monetary policy represented by interest rate and fiscal policy denoted by government spending in achieving full employment and favourable trade balances. The theory posited that rise in exchange rate has expansionary effects on the economy provided Marshall-Lerner condition is achieved (Mundell, 1963 and Fleming, 1962). Exchange rate depreciation stimulates aggregate demand, promotes export and diverts expenditure from foreign products to home products. Meade (1951) developed the traditional views which emanated from money-less Keynesian model. This model was later modified to incorporate monetary policy variables (Dornbusch, 1973, 1986). The author assumed that exchange rate depreciation stimulates export trade which significantly improve the performances of macroeconomic variables. Depreciation of currency could be contractionary in that increase in price of domestic goods will trigger -off inflation which reduces the purchasing power of money. Its effects on real income are relative to the elasticity of demand of the domestic goods.

Empirically, some scholars have attempted to examine the effect of exchange rate on inflation in Nigeria. For example, Ari, Edson and Félix (2021) in their study of Mozambique indicated that exchange rate leads to price increase while Umaimah and Aliyu (2022) found a positive relationship between exchange rate and food inflation in Nigeria. In a similar study of Nigeria, Sa'ad, Usman, Omaye and Yau (2023) indicated that depreciation of exchange rate significantly impacts on inflation. Usman and Aliyu (2019) found that regime change in inflation is largely caused by exchange rate. Adedokun, Ogbaekirigwe, Tiamiyu (2022) noted that exchange rate influences inflation more in the short run. In a panel study of 40 Sub-Saharan Africa, Diby et al (2019) found that pass-through is higher in countries with fixed exchange rate regimes than in countries with floating exchange rate regimes. Amos et al (2020) indicated that inflation had a significant positive impact on sustainable development while Obasanmi (2020) indicated that exchange rate changes pass-through inflation rate both in the short and in the long run.

Kanchan (2014) found that exchange rate is vital in stimulating export trade in India. Hamisu, Yakubu, Abba and Mohammed (2016) affirmed that exchange rate variation contributed to the crude oil price in India. Adu, Karimu and Mensah (2015) in a similar study in Ghana from 1980 to 2012 using Vector Autoregressive (VAR) techniques found that nominal shocks, demand and supply substantially determine exchange rate variation in Ghana. In South Africa, Ali, Mukhtar, Tijani and Auwal (2015) found that there is no long-run relationship between exchange rate, export and import while Glenville (2013) reported that exchange rate and import do not drive inflation. On the other hand, Phiri (2014) noted that exchange rate leads to price differentials in South Africa.

This study is novel following the inclusion of exports, imports, interest rate and foreign direct investment as the factors that drive inflation in Nigeria. Some of the previous study used a two-variable model which relate inflation to exchange rate while others relate inflation to exchange rate and oil price. On the methodological gap, some of the empirical studies utilized Ordinary Least Square (OLS) techniques which does not consider the interdependence that might exist among the variables. Such studies inadequacies might lead to spurious regression (Adeleke, 2013, and Uwazie, Igwemma & Nnabu, 2015). However, this study applied vector error correction model which is not only designed to take care of variables that are integrated of order one but also considers the interdependence among the variables.

4.0 Methodology

The monetarist posited that inflation is due to excess money stock. In line with the views of monetarist, Imimole and Enoma (2011) and Inyiama and Ekwe (2014) attributed inflation in Nigeria to future price expectation, public expenditure, GDP, money stock and dynamics of exchange rate. However, in a bid to open the economy to the outside world, the postulations of these scholars are modified to incorporated export, import, interest rate and FDI to the equation. Therefore, the equation 1 is specified in its functional form as:

$$IF = f\ (EXR, XP, IP, INT, MS, FDI) \qquad 1$$

The equation 1 is transformed into econometric and logarithm form as:

$$IF_t = \beta_0 + \beta_1 logEXR_t + \beta_2 logXP_t + \beta_3 logIP_t + \beta_4 INT_t + \beta_5 logMS_t + \beta_6 logFDI_t + \varepsilon_t \qquad 2$$

Where IF is inflation and the dependent variable while the independent variables include: EXR is exchange rate, XP is export, IP is import, INT is interest rate, MS is money supply and FDI is foreign direct investment, e_t is error term, $\beta^{'s}$ represents the coefficients. Log is the logarithm. Exchange rate is logged since it is in nominal naira value.

4.1 Estimation Procedures

The study began with the determination of the order of integration of each variable. Ignoring the non-stationarity of the economic variables may lead to spurious analysis and may negate the tenets of standard econometric techniques. Therefore, the estimation procedures are analysed as follows:

4.1.1 Unit Root Test

The estimation begins with a unit root test to confirm the stationarity of each series in the model. The study utilized Augmented Dickey – Fuller (ADF) of 1979, Phillips – Peron (PP) derived from Phillips & Peron (1988). The choice of these tests is because the ADF takes into consideration the possibility of autocorrelation that may arise as the result of differencing each variable while Phillip-Peron test is appropriate when the sample size is small, variables are serially correlated, and heteroscedastic (Gujarati & Porter, 2009). However, due to possibility of structural changes that might have occurred within the period under study, Obioma and Ozughalu (2010) posited that the use of ADF only might be biased in discovering variables that are integrated. Therefore, it becomes imperative to employ Phillip-Peron (PP) to accommodate the inadequacies of ADF test. The ADF unit root test is generally specified below as

$$\Delta Y_t = \alpha_0 + Y_{t-1} + \sum_{i=1}^{n} \alpha_1 \Delta Y_{t-1} + \delta_t + \epsilon_t \qquad 3$$

Where,Y represent each variable, Y_{t-1} represent each lagged variable, Δ is the difference operator, δ_t is trend term, n is lag length and ε_t represent pure white noise error term with zero value of mean and constant variance, α_0 is a constant and n is the optimum number of lags in the dependent variable. If each variable has unit root at level and integrated then it becomes important indication of co-integration within the model. The major challenge in the application of this approach is due to the inability of the test to determine false hypothesis. This most time, might lead to rejection of null hypothesis that supposed to be accepted. However, the use of Monte Carlo Simulation has proved the power of ADF to be weak. To overcome these identified challenges of relying solely on ADF, the study therefore specified Phillip-Peron test as follows:

$$\Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \varepsilon_t \quad 4$$

Where Y is the series, Y_{t-1} is the lag of each series, Δ represent difference indicator, ε_t is the pure noise error term and β_0 is a constant. The maximum lag length is empirically determined using Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The ADF and PP equations are specified to determine whether the variable Y_t represent each variable at time t. The null hypothesis of the ADF and PP tests is that Y_t is non-stationary, that is, has a unit root (H_0: $\beta = 0$) and is rejected if β is significantly negative (H_a: $\beta < 0$).

4.1.2 Cointegration Test

This method is mostly used when the unit root test results indicated that the variables are integrated of order one. This approach is an improvement over the OLS approach (Johansen, 1991). Unlike OLS approach, Johansen approach takes care of the endogeneity issues in each model and it gives insight to the number of cointegrating equation(s) and equally evaluates the influence of restrictions on the estimates. Specifically, this approach which consists of trace and maximum eigenvalue is applied to determine the number of cointegrating vectors. The techniques test the null hypothesis that each of the cointegrating equation is smaller or equal to 'r' cointegrating relationship. To determine the number of cointegrating equation, the model is specified by Johansen (1988) and Johansen and Juselius (1990) as:

$$\lambda_{trace} = T \sum_{j=r+1}^{p} (1 - \lambda_j) \quad 5$$

Where T represents the available observations, r is cointegrating vector, λ_j is calculated eigenvalue obtained from the matrix, p is lag length. The equation tests the null hypothesis (r) against its alternative hypothesis (r+1). The null hypothesis is rejected if the p-value is less than 0,05 ($r \leq 0.05$) and accepted if otherwise. Also, the maximum eginvalue test is specified as:

$$\lambda_{max} = r, r+1 = -T(1 - \lambda_{r+1}) \quad 6$$

The hypotheses are tested as:

H_0: $\pi = r$,

H_1: $\pi = r + 1$.

Where, π represents number of co-integrating vectors. The Johansen and Juselius (1990) argued that likelihood test does not care about the standard distribution of the variables but only provide the required critical value as determined by Monte Carlo techniques.

4.1.4 Vector Error Correction Model

The equation 2 does not explain the interdependence between dependent and explanatory variables. To effectively analyze the objectives of this study, it became imperative to employ vector error correction model (VECM) to take care of the interdependence that might exist between the dependent and independent variables (Uwazie, Igwemma & Nnabu, 2015). The vector error correction model (VECM) is applicable when the series are cointegrated. VECM provides the opportunity to analyze both the short and long run impact of the explanatory variables on the dependent variable. The error correction term (ECT) represents short run adjustment to the long run equilibrium. Theoretically, the coefficient of ECT is expected to be negative and significant and fractional in order to adjust to long run equilibrium. The general of VECM is specified as:

$$\Delta y_t = \delta + \sum_{i=1}^{m} \Gamma_{i\,\Delta Y_{t-1}} + \sum_{i=1}^{m} \Gamma_{i\,\Delta X_{t-1}} + \Pi\,\varepsilon_{t-1} + \mu_t \qquad 7$$

Where Δ is the first order time difference (i.e., $\Delta Y = Y_t - Y_{t-1}$) and ε_{t-1} is error correction term (ECT), μ_t is while noise error and m is the lag length. The coefficient of ε_{t-1} shows the speed at which the short run disequilibrium adjusts to long run equilibrium. The VECM is sensitive to the number of lags used for the analysis (Brooks, 2008). To avoid these problems, it important that the required lag length is empirically ascertained using Akaike information criterion (AIC) and Schwarz information criterion (SIC).

4.1.5 Post Tests

The study conducted diagnostic tests to find out whether the results of the analyses conform to some of the assumptions of the classical models. It includes: Breusch-Godfrey test which test the presence of autocorrelation. This test is preferred to Durbin-Watson test in that does not lose its powers in the presence of lagged dependent variables. The Ramsey RESETS is used to determine if there is specification problem within the model while autoregressive conditional heteroscedasticity (ARCH) employed to determine if the errors are homoscedastic. The insignificance of these tests indicates acceptance of the null hypotheses of no autocorrelation, no functional form problem and that the residuals are homoscedastic. The CUSUM test measures structural stability of a system of equations. The test consists of CUSUM and CUSUMQ cumulative sum of squares. These tests are plotted within prescribed 5 percent boundary limit. The estimates are unstable if recursive errors did not fall within the critical boundary lines.

5.0 Results

5.1 Unit Root Test Results

The unit tests are performed using Augmented Dickey-Fuller (ADF) and Phillip-Peron (PP) unit root test. The results are presented as follows.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test Results

variable	ADF Results		Phillip-Perron Results		Order of integration
	Level	1st diff	Level	1st diff	
Log(EXR)	-1.643882 0.1565	-5.327846*** 0.0000	-1.907370 0.6342	-5.349421*** 0.0004	I(1)
IF	-2.953225 0.1565	-7.540009*** 0.0000	-2.919273 0.1664	-7.832119*** 0.0000	I(1)
Log(XP)	-1.609304 0.7736	-6.843627*** 0.0000	-1.647579 0.7577	-6.860471*** 0.0000	I(1)
Log(IP)	-1.882247 0.6471	-7.374173*** 0.0000	-2.027081 0.5710	-7.336079*** 0.0000	I(1)
Log(FDI)	-1.956128 0.6084	-11.66963*** 0.0000	-3.154659 0.1066	-11.57599*** 0.0000	I(1)
Log(MS)	-1.04164 0.9275	-6.693329*** 0.0000	-1.152646 0.2012	-6.823356*** 0.0000	I(1)
INT	-3.138283 0.1101	-7.521660*** 0.0000	-3.116377 0.1150	-9.345023*** 0.0000	I(1)

Note: *, **, *** indicates significant at 1 percent, 5 percent and 10 percent respectively. Upper values represent t-statistic while the lower value is p-value

Source: Author's Computation, 2024

At level, p-values of ADF indicated that all the variables are non-stationary but became stationary at first difference. The Phillip-Peron (PP) unit root test results are in tandem with the findings of ADF. Both affirmed that the series contained unit root at level but stationary at first difference. Therefore, the variables are said to be integrated of order one [I (1)]. Thus, this justifies the application of Johansen cointegration test to examine long term influence of exchange rate variation on macroeconomic variables in Nigeria.

5.2 Cointegration Test Result

The cointegration result on the relationship between exchange rate variation and domestic price level in the Nigeria is tested using Johansen Cointegration technique. The results are presented as follow:

Table 2: Results of Cointegration Test

Null Hypothesis	Trace Statistic	5% Critical value	p-value	Null Hypothesis	Maximum-Eigen Statistic	5% Critical Value	p-value
r = 0*	329.7850	125.6154	0.0000	r = 0*	117.6886	46.23142	0.0000
r ≤ 1*	212.0965	95.75366	0.0000	r ≤ 1*	81.44235	40.07757	0.0000
r ≤ 2*	130.6541	69.81889	0.0000	r ≤ 2*	62.76948	33.87687	0.0000
r ≤ 3*	67.88464	47.85613	0.0002	r ≤ 3*	30.09881	27.58434	0.0233
r ≤ 4*	37.78583	29.79707	0.0049	r ≤ 4*	22.30211	21.13162	0.0341
r ≤ 5	15.48372	15.49471	0.0502	r ≤ 5	9.225351	14.26460	0.2679
r ≤ 6	6.258371	3.841466	0.0124	r ≤ 6	6.258371	3.841466	0.0124

Note: * denotes rejection of null hypothesis at the 0.05 level. It equally indicates 5 cointegrating eqn(s)
Source: Author's Computation, 2024

Table 2 indicated 5 cointegrating equations. The p-values less than 0.05 indicated that there is evidence of cointegration. This entails evidence of long run relationship between inflation (IF), exchange rate (EXR), export (XP), import (IP), interest rate (INT), MS and FDI. The maximum eigen statistics equally proved the evidence of cointegration among the variables. The presence of cointegration among the variables makes it obligatory to perform the granger causality test as well as determine the short run and the long run relationship between exchange rate and price level in Nigeria using VECM.

5.4 Results of Short Run

VECM was used since cointegration test of model four indicated presence of long-term stability between exchange rate variation and inflation rate in Nigeria. It is presented as follows:

Table 4: Short Run Result

Dependent variable: D(IF)

Variable	Coefficient	t-Statistic	Prob.
ECT(-1)	-0.855983	-4.711009*	0.0001
D(IF((-1))	0.227024	1.276220	0.2127
D(IF(-2))	-0.084387	-0.555829	0.5829
D(log(EXR(-2)))	18.45526	2.187891*	0.0375
D(log(XP(-1)))	-22.09146	-3.281432*	0.0029
D(log(XP(-2)))	-22.98260	-3.381345*	0.0022

D(log(IP(-1)))	12.21261	1.555859	0.1314
D(log(IP(-2)))	14.22887	1.783184	0.0858
D(INT(-1))	-2.561530	-3.393002*	0.0021
D(INT(-2))	-1.651173	-2.367284*	0.0253
D(log(MS(-1)))	-2.206938	-1.419550	0.1672
D(log(MS(-2)))	-0.648920	-0.415004	0.6814
D(log((FDI(-1)))	-6.095761	-2.168734*	0.0391
D(log(FDI(-2)))	1.494400	0.616447	0.5428
C	4.621010	1.582865	0.1251
F-statistic	3.545396		
Prob(F-statistic)	0.002067		
Durbin-Watson	2.186735		

Note: * denotes significant at 0.05 levels

Source: Author's Computation, 2024

The p-values of lagged inflation (IF(-1) F-2)) are not statistically significant while the second lag of exchange rate (EXR (-2) is statistically significant in the short run. This assertion is in consonance with Phiri (2014), Mandizha (2014) and Kanchan (2014). These study attributed inflation to exchange rate variation in their respective countries of study. The result equally shows that export (log(XP)) has significant impact on inflation in the short run. The negativity of export is an indication that increases in export reduces the level of inflation. Also, imports (log(IP)) exhibited expected positive sign with inflation though failed to be statistically insignificant. The interest rate (INT) has significant negative relationship with inflation. Money supply (log(MS)) is statistically insignificant while first lag of foreign direct investment exhibited significant impact on inflation. The R^2 (0.663262) revealed 66.33 percent variation in inflation is explained by past the explanatory variables. F-statistic of (3.545396) with its probability value of 0.002067 revealed that the explanatory variables have jointly impact on inflation. Durbin-Watson (2.186735) highlighted no autocorrelation within the residuals. The ECT(-1) is negative and statistically significant in line the theoretical expectation. Its coefficient of -0.855983 indicated that the economy adjusts by 85.59% every year for equilibrium to be restored in the long run. The study revealed that recent astronomical increase in prices of goods and services in Nigeria is due to the rapid deterioration of exchange rate of Naira over the years. The long run result is presented as follows:

Table 5: Long run Result

Variable	Coefficient	Std error	t-stat
log(EXR(-1))	16.56224	3.14715	5.26261*
log(XP(-1))	-36.48541	7.64760	-4.77083*
LOG(IP(-1))	39.09063	6.70520	5.82990*
INT(-1)	-4.466546	0.35502	-12.5811*
log(MS(-1))	-3.180661	0.83860	-3.79284*
log(FDI(-1))	-4.137685	1.28857	-3.21107*
C	80.08439		

Note: * denotes significant at 0.05 levels

Source: Author's Computation, 2024

The long run result revealed that exchange rate leads to inflation in the long run. The t-statistic of exchange rate of 5.26261 is high and its coefficient of 16.56224 indicated that 1%

depreciation drives inflation 16.56% in the long run. This shows that exchange rate is the fundamental driver of inflation in Nigeria over the years. On the other hand, the study further posited that exports, interest rate and foreign direct investment are critical forces that can drive down inflation in Nigeria. The t-statistics of these variables are all high suggesting that all of them are statistically significant while their respective coefficients of -36.48541, -4.666546 and -4.137685 indicated that a unit increase in these variables will respectively translate to 36.49%, 4.47% and 4.14% decline in inflation in the long run. These findings are in tandem with the theoretical expectations. However, import s has been found to be detrimental to inflation in Nigeria in the long run. Its coefficient of 39.09063 revealed that 1% rise in import demand will result in 39.09% rise in inflation in Nigeria in the long run. This assertion is in line with the a priori expectation.

The depreciation of naira has resulted to increase in price of imported consumable goods, raw materials and capital goods in the country. The increased import price of consumer goods culminated to acute shortage of supply which triggered-off increase in general price level. On the other hand, sudden rise in price of imported inputs gave impetus to astronomic increase in marginal cost of production which were transferred to the consumers inform of high prices. This has translated to the recent increase in price of domestically produced commodities. As import dependent economy, attempt made to mitigate the transmission mechanism of exchange rate variation through increase in monetary policy rate from 12 percent to 13 percent and cash reserve ratio from 15 percent to 20 percent further heightened the cost of production. The problem is compounded by the erratic power supply and illusive infrastructural facilities. Also, over reliance on the imported refined petroleum products which resulted to astronomical rise in domestic price of these products further worsen marginal cost of production. These have translated to stagflation which consequently eroded middle-class and heightens the poverty index as salary and wage earners cannot easily pass on the burden of price increase. The fact that exchange rate variation transmits to rise in domestic price of goods and service is in tandem with the studies such as Imimole and Enoma (2011), Inyiamal and Ekwe (2014), and Kanchan (2014). These studies identified that exchange rate variation leads to inflation in an economy.

5.6 Results of Post Estimation Test

Table 6 present the post estimation tests such as normality test, serial autocorrelation, homoskedasticity and model specification test. The results are presented as follow:

Table 6: Results of Post Estimation Tests

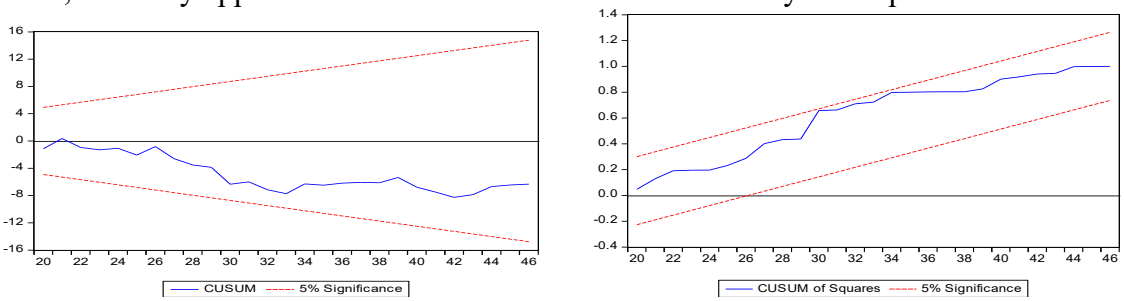
Test Method	Obs	F-statistic	Prob.
Jarque-Bera	43	2.592001	0.273624
Breusch-Godfrey serial correlation LM test	43	0.504657	0.6097
Autoregressive Conditional Heteroskedasticity (ARCH)	42	0.003106	0.9558
Ramsey RESETS test	24	2.594807	0.0759

Note: * denotes significant at 0.05 levels

Source: Author's Computation, 2024

The p-values of 0.273624, 0.6097, 0.9558 and 0.0759 of Jarque-Bera, autocorrelation, ARCH test and specification error test respectively are greater than 0.05 level. It concluded the series are normally distributed, there is no presence of autocorrelation, no functional problem and the residuals are homoskedastic.

Also, the study applied CUSUM test to determine the stability of the parameter estimates.



A B

Source: Author's plot from VECM results, 2024

Figure 1: CUSUM Test Result

Figure 1 revealed that the line of CUSM and CUSUMQ lies within 5 percent critical boundaries. It indicated that there is long run stability of the parameter estimates of exchange rate variation and inflation in Nigeria.

6.0 Conclusion

The study attributed the high inflation in Nigeria to the deterioration of exchange rate over the years. In the short-run, exchange rate has transmission effect on domestic price level to the tune of 18.46% and 16.56% in the long run. This implies that exchange rate variation has transmission effects on the economy. That implies that exchange rate variation is becoming a major problem in controlling inflation in Nigeria. Also, exports are established to lead to the decline in inflation while import pushes inflation in Nigeria. This implies that rising exports has the tendency to curb the problem of inflation in Nigeria while imports results in inflation. The study however, makes the following recommendations:

Since export has positive relationship with the inflation, government should promote exports by encouraging domestic production and import substitution to reduce reliance on imports. This measure will boost exports which will invariably lead to the decline in inflation.

Having found that exchange rate leads to inflation Nigeria, the monetary authorities are advised to embark on implementing a more flexible exchange rate regime that is capable of absorbing the external shocks on the domestic prices. This will boost the investors' confident and in the long run result in decline in inflation.

Having established that imports is responsible for the rising inflation in Nigeria, it is imperative that government should discourage imports especially on consumer goods by encouraging firms that produce for export. This will discourage imports and boost exports which will translate to decline in inflation.

Since in line with the theory, the study found that increase in money supply leads to rise in inflation, the Monetary authorities should pursue prudent monetary policies targeting firms that produce for export. The macroeconomic stability in the exports will ensure reduction in inflation in the long run.

References

Abiodun S. B., Ajibola I. O., Inuwa A. T., Idowu, P., Sani, B., Anigwe J. O., & Udoko C. O. (2016). Exchange Rate Pass-Through to Inflation in Nigeria. *CBN Journal of Applied Statistics*, 7(1a), 49 – 70. (https://www.econstor.eu/bitstream/10419/142112/1/cbn-jas_v7-i1-pp049-070.pdf)

Adedokun, A. S., Ogbaekirigwe, C. O., Tiamiyu, K. A. (2022). Exchange rate pass-through to inflation: Symmetric and Asymmetric effects of monetary environment in Nigeria. ACTA Universitatis Danubius, 18(2), 24 – 41. (https://ideas.repec.org/a/dug/actaec/y2022i2p24-41.html)

Adeleke, A. I. (2013). Introduction to macro-econometric modelling and model specification for the Nigeria economy. A paper presented at Centre for Econometric and Allied Research (CEAR), department of economics, University of Ibadan. Econometric workshop module IV, November 25-29.

Adu, G., Karimu, A., & Mensah, J. T. (2015). An empirical analysis of exchange rate dynamics and pass-through effects on domestic prices in Ghana. International Growth Centre (IGC) *Working Paper*, London School of Economics and Political Science, Houghton Street, London WC2A 2AE. (https://www.theigc.org/sites/default/files/2015/11/Adu-et-al-2015-Working-paper-1.pdf)

Ali, H. S., Mukhtar, U., Tijani, B. A., & Auwal, A. M. (2015). Dynamic relationship of exchange rates and crude oil prices in South Africa: Are there asymmetries? *Research Journal of Finance and Accounting*, *6*(6), 195-200.

Amos, O. O., Anayo, V. E., Anu, K. T., Walid, G. A., & Peter O. O. (2020). The feedback effects of exchange rate pass-through inflation on sustainable development in Nigeria. 4(2), 70-84.

Ari, A., Edson, M., & Félix, F. S. (2021). An empirical assessment of the exchange rate pass-through in Mozambique. IMF Working Paper, WP/21/132, 1 -32.

Branson, W. H. (1986). Stabilization, stagflation and investment incentives: The case of Kenya 1975 – 80. In: S. Edwards and L. Ahamed, (ed.) *economic adjustment and exchange rates in developing countries*, University of Chicago Press.

Brooks, C. (2008). *Introductory econometrics for finance.* London, Cambridge University Press.

Central Bank of Nigeria (2021). *Central bank of Nigeria statistical bulletin.* Available at www.cbn.gov.ng/documents/ Statbulletin.asp

Choudhri, E. U., & Hakura, D. S. (2006). Exchange rate pass-through to domestic prices: Does the inflationary environment matter*? Journal of International Money and Finance*, 25, 614 – 639.

Dada, E. A., & Oyeranti, O. A. (2012). Exchange rate and macroeconomic aggregates in Nigeria. *Journal of Economics and Sustainable Development, 3*(2), 93 – 101. www.iiste.org

Diby F. K., Dilesha, N. R., Akadje, J. R. E. Yobouet, T. G., Pierre, A. L., Ning, D., & Gang, S. (2019). Asymmetry in exchange rate pass-through to consumer prices: New perspective from Sub-Saharan African countries. *Economics,* 1 – 33.

Dornbusch, R. (1973). Devaluation, money, and non-traded goods. *The American Economic Review*, *63*(5), 871-880.

Dornbusch, R. (1986). Special exchange rates for capital account transactions. *The World Bank Economic Review*, 1, 3 – 33.

Fleming, J. M. (1962). Domestic financial policies under fixed and floating exchange Rates. *IMF Staff Papers, 9*(3), 369 – 379.

Glenville, R. (2013). Inflation and the purchasing power parity in South Africa. *Journal of Applied Business and Economics, 15*(3), 11 - 18.

Gokhale, M. S., & Raju, R. (2013). Causality between exchange rate and foreign exchange reserves in the Indian context. *Global Journal of Management and Business Research Finance, 13(7), 449-456.*

Gujarati, D. N. & Porter, D. C. (2009). *Basic econometrics*. 5th ed. New Delhi, McGraw-Hill

Hamisu, S. A., Yakubu, J. A., Abba, N. Z., & Mohammed, A. Y. (2016). Asymmetric co-integration analysis of exchange rates and crude oil prices: evidence from India. *International Journal of Economics, Commerce and Management, IV (1), 207 – 217.*

Imimole, B., & Enoma, A. (2011). Exchange rate depreciation and inflation in Nigeria (1986–2008). *Business and Economic Journal, 28*(1), 34-51.

Inyiama, O. I., & Ekwe, M. C. (2014). Exchange rate and inflationary rate: do they interact? Evidence from Nigeria. *International Journal of Economics and Finance; 6(3), 80 – 87*. doi:10.5539/ijef.v6n3p80. URL: http://dx.doi.org/10.5539/ijef.v6n3p80

Johansen, S. (1988). Statistical analysis of cointegration vector. *Journal of Economic Dynamics and Control, 12*(2-3), 231–254. http://dx.doi.org/10.1016/0165-1889(88)90041-3

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, *59*(6), 1551–1580.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics 52*(2), 169–210. http://dx.doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Kanchan, D. (2014). Relationship between Currency Depreciation and Trade Balance in Indi: An Econometric study. *Journal of Finance and Economics*, *2*(3), 83-89. doi: 10.12691/jfe-2-3-5. Available online at http://pubs.sciepub.com/jfe/2/3/5

Macrotrends (2023). Nigeria inflation rate. https://www.macrotrends.net/global-metrics/countries/nga/nigeria/inflation-rate-cpi

Meade, J. (1951). *The theory of international economic policy Vol. 1: The balance of payments*. London and New York: Oxford University Press.

Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science*, 475 - 485.

Munir, A. S. C., & Aslam, M. C. (2007). Effects of exchange rate on output and price level: Evidence from the Pakistani economy. *The Labor Journal of Economics*, *12*(1), 49 – 77.

Musa, N. (2021). Impact of exchange rate volatility on inflation in Nigeria. *Journal of Contemporary Research in Business, Economics and Finance, 3*(1), 26-38.

Obasanmi, J. O. (2020). Exchange rate pass-through and its impacts on the Nigeria economy. *Journal of Economics, Management and Trade, 26*(9)*, 44-53.* DOI: 10.9734/JEMT/2020/v26i930290

Obioma, E. C., & U. M. Ozughalu. (2010). an examination of the relationship between government revenue and government expenditure in Nigeria: Cointegration and causality approach. *Central Bank of Nigeria Economic and Financial Review*, *48*(2), 35-57.

Phillips, P.C.B., & Perron, P. (1988) Testing for a unit root in time series regression. *Biometrika,* 75, 335-346. http://dx.doi.org/10.1093/biomet/75.2.335

Phiri, A. (2014). Purchasing power parity (PPP) between South Africa and her main currency exchange partners: Evidence from asymmetric unit root tests and threshold co-integration analysis. Munich Personal RePEc Archive (MPRA) Paper No. 53659, posted 14 February 2014. Online at https://mpra.ub.uni-muenchen.de/53659/

Sa'ad S., Usman A.B., Omaye S.O. & Yau H. (2023). *Asymmetric Pass-through Effects of Oil Price Shocks and Exchange Rates on Inflation in Nigeria: Evidence from a Nonlinear ARDL Model.* ESI Preprints. 350 -373 https://doi.org/10.19044/esipreprint.1.2023.p350

Tule, K. M.; Oboh, U. V.; Ebuh, G. U.; Onipede, S. F., & Gbadebo, N. (2020). Does exchange rate volatility affect economic growth in Nigeria? *International Journal of Economics and Finance*, *12*(7), 54 – 71. https://doi.org/10.5539/ijef.v12n7p54

Umaimah, A. U., & Aliyu, U. (2022). Effects of exchange rate on food inflation in Nigeria: A non-linear ARDL approach. *Gusau International Journal of Management and Social Sciences, Federal University, 5(1), 195 – 209.*

Usman, A. B., & Aliyu R. S. (2019). Inflation dynamics and exchange rate pass-through in Nigeria: Evidence from augmented nonlinear new Keynesian Philips Curve. CBN Journal of Applied Statistics, *10*(2), 109-138. https://doi.org/10.33429/Cjas.10219.4/6

Uwazie, I. U., Igwemma, A. A., & Nnabu, B. E. (2015). Causal relationship between foreign direct investment and economic growth in Nigeria. *International Journal of Economics and Finance,* 7(11), 230 – 241. Doi: 10.5539/ijef.v7n11p230.

Volkan, A., Saatcioglu, C. and Korap, L. (2007). Impact of exchange rate changes on domestic inflation: The Turkish experience. *The Business Review*, *8*(2), 150 - 158.

Wijnbergen, S. V. (1986). Exchange rate management and stabilization policies in developing countries. *Journal of Development Economics, 23*, 227-247.

World Bank (2020). Official exchange rate. https://data.worldbank.org/indicator/PA.NUS.FCRF