Analysis of the impact of Exchange rate depreciation and Imports on inflationary trend in Nigeria.

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Abstract

This study examined the effects of persistent exchange rate depreciation and volume of imports on inflationary trend in Nigeria. It was motivated by the quest to ascertain how exchange rate depreciation and dependency on foreign made goods and services affected government effort to control inflation. The study employed the autoregressive distribution lag (ARDL) technique to test the short-run and long-run effects of exchange rate depreciation and volume of imports on inflationary trend using annual time series data from 1986 to 2021. The empirical result revealed that the exchange rate has negative and insignificant effect on inflation rate. The result also revealed that imports have positive and significant impact on inflation rate. The result further revealed that import Granger causes inflation within the period of the study. By implication, the net effect of this study established that depreciation of exchange rate and over dependency on imports contributes in the worsening inflation rate in Nigeria's economy. On the premise of the empirical findings, this study recommends; that there is great need for government to encourage people to consume locally made goods as a way of reducing imported inflation in the country and formulation and proper management of exchange rate policy that will help reduce continuous depreciation of naira as it may trigger over supply of domestic currency. If the recommendations are utilized it would help make government effort towards inflationary control more effective by reducing the adverse effects of depreciating foreign exchange system and over dependency on imports.

Keyword: Exchange Rate, Import, Inflation Rate Nigeria.

INTRODUCTION

With the introduction of structural adjustment programme as one of the conditions offered to Nigeria by International Monetary Fund (IMF) in 1986 when the country obtained IMF loan. The SAP itself was perceived to be one of the components necessary for economic recovery from recession it was facing. The implementation of the SAP policy led to the introduction of financial sector reforms. Part of the reform is the abandoning of the fix exchange rate policy in favour of the free floating exchange rate policy. The move was as result of the believe that free floating exchange rate would curb the boom and bust syndrome and push the economy towards a growth path. The growth that would arise from free floating exchange rate are expected to encourage consumer price stability, more investment and favourable balance of trade. However, the free floating policy led to the continuous depreciation of naira at foreign exchange market. The depreciating exchange rate is suspected to have some influence on consumer price index.

Reduction in inflation trend is one of the key macroeconomic policy objectives of every nation weather the nation is developed or developing. Inflation is better fought by tackling the root cause if it is detected. It is believed that many factors contributes in increasing the inflationary trend, some of which include, increased money supply without corresponding increase in output, excess demand, inflation from other countries etc. Amongst the factors that are susceptible, exchange rate depreciation is one of them. In Nigeria there has been constant depreciation in the value of Naira in terms of other currencies. Though currency depreciation can improve a nations export by making it competitive and as well improve her trade deficit over time, but in a country that relies much on import it will likely import inflation from other countries. It may even scare away investors that are afraid of further fall in the value of given currency. For instance, less dependent on import country like China between 2015 and 2016 engaged in a serious battle of word with the

United State of America for devaluing her currency. America felt that the devaluation will give China advantage in her trade with them. China on her part insists that the move was necessary to prevent a further slide in her export.

Management of exchange rate is vital in international trade and constitutes the major macroeconomic tool that has attracted the interest of researchers for theoretical and empirical studies. Most countries devote time to ensure the equilibrium state of the real rate of exchange of her currency with other currencies since it is directly proportional to the appreciation and depreciation of their home currency. For instance, appreciation of real rate of exchange favours import since foreign goods are cheaper than the domestic goods. On the other hand the depreciation of the real rate of exchange plays the opposite role. The appreciation of real exchange represents a problem to export since it makes goods and services less competitive in the global markets (Dung & Okereke 2022).

Milton Friedman (1968) posits that increase in money supply is the monetary factor responsible for the rise in price level which makes the domestic goods and services to become less competitive both at home and outside the country when compared with other countries. An output looses market in and outside the country thereby making imports to increase while exports slides down. This implies that those buying the country's goods and services will demand less of their currency to settle accounts with them while consumers within the domestic economy will be supplying more of their local currency to settle account with the outside world. The supply rise of the local currency will lead to depreciation of the exchange rate. Depreciating currency will mean that the price of the country's export will fall while price will rise. With time the volume of import will fall since import has become more expensive and the volume of export will rise since export has turned relatively cheaper, hence through self adjusting mechanism depreciation can then turn to

appreciation. The question here is; can such self adjustment happen in an import dependent economy like Nigeria? Is there any relationship between currency depreciation and inflation rate in Nigeria. This and other questions is what this research endeavour intends to unravel.

Review of Related Literature

Conceptual framework

Exchange is the rate at which a local currency exchanges for a foreign currency; it is otherwise regarded as foreign exchange rate and usually stated as the amount of a local currency that will exchange for a unit of foreign currency. If the exchange rate of a currency is fixed, the rate will be maintained all over the world through arbitrage. An exchange rate of N100 to one American Dollar in Nigeria is equivalent to 0.01dollar to one naira in Germany. If the exchange rate is N150 to a Dollar in Nigeria and 0.01 Dollar to the Naira in Germany, arbitrageurs will buy Dollar in Germany to sell in Nigeria and realize N50 on every Dollar sold, the increased supply of Dollar in Nigeria will cause Naira to appreciate and the equality will be restored. The reduction of exchange rate of Naira to the Dollar refers to appreciation of the Naira and depreciation of the Dollar while increase in the foreign exchange rate of naira to the Dollar means depreciation of the naira and appreciation of the Dollar.

The value of a specific currency is determined on the basis of the economic situation and sometimes on political situation. It impacts on other economic decision and values of products and output. It affects financial market of the country's securities. Exchange rate depreciation refers to the decline in the value of a particular currency relative to other countries exchange rate. The decline in exchange rate could be as a result of import and export, political instability and other macroeconomic events. Currency depreciation and its impacts greatly depend on the situation and

current condition of a country's economy. For instance, during recession devaluation can bring economic growth by enhancing industrial output due to competitive position it places on the demand for the national output. On the other hand, booming economy that devalues her currency may experience slowdown as it will likely increase inflation rate?

In economic thinking, inflation is an increase in the general price level of goods and services in an economy. When the general price level rises, each unit of currency buys fewer goods and services; consequently, inflation corresponds to a reduction in the purchasing power of money. The opposite of inflation is deflation, a sustained decrease in the general price level of goods and services. The common measure of inflation is the inflation rate, the annualized percentage change in a general price index. As all prices do not increase at the same rate, the consumer price index (CPI) is often used for this purpose. The employment cost index is also used for wages in the United States

Conceptually, inflation refers to the general trend of prices, not changes in any specific price. For example, if people choose to buy more cucumbers than tomatoes, cucumbers consequently become more expensive and tomatoes cheaper. These changes are not related to inflation; they reflect a shift in tastes. Inflation is related to the value of currency itself. When currency was linked with gold, if new gold deposits were found, the price of gold and the value of currency would fall, and consequently, prices of all other commodities would be higher. Inflation rate is the pace of increase in the general price level over a given period of time.

Theoretical Review

Balance of Payment Approach

This approach of exchange rate determinants shows that internal and external equilibrium exist. The internal equilibrium assumes full employment; in this case there is natural rate of unemployment. Nevertheless, there are no strains to alter actual wages in unemployment. Balance of payments equilibrium is also known as external equilibrium. The approach explains permanent deviations of purchasing power parity PPP. The core challenge with this method is that in general it is extremely difficult to determine the exact natural rate of unemployment, or the exchange rate that is consistent with equilibrium of the external accounts. However, the rate of exchange convergence will be determined by the model; it provides very little guidance to the short term fluctuations (Hoontrakul 1999).

Traditional Flow Model

This model states that the market flow of demand and the market flow of supply of foreign exchange is determined by exchange rate. Hence, the supply equates the demand for foreign exchange when there is equilibrium. The interaction of the two essential variables, determine the rate of exchange or rather, the exchange rate assumed by the model. The variables are: rate of interest differential and relative income. It is justified because domestic demand for foreign goods is a function of domestic income and vice versa, and also asset demand depends on the difference between foreign and domestic interest rates.

The Elasticity Approach to Exchange rate

The elasticity approach to exchange rate tries to predict the outcome of policy changes will have on the balance of trade and in turn balance of payments. For example, this method illustrates how the balance of payments is affected by the rates of exchange. Furthermore, the elasticity approach to exchange rate assumes that devaluation can enhance the balance of payments if actually the balance of payments in rightly in equilibrium. However, the price elasticity of local and international demand for imports has to rise for devaluation to function maximally. Under an ideal situation or condition also referred to as the „Marshall-Lerner condition", when a country devalues a currency, it tends to improves the balance of payments

The Monetary Approach

The monetary policy is effective under flexible exchange rate regime but ineffective under fixed exchange rate regime (Jhingan 1983). Consider the effect of monetary policy under floating exchange rates with relative capital mobility. If government increases the monetary base, interest rate will fall and income will rise. With a fall in interest rate, capital will flow out of the economy leading to increase in the demand of foreign currency and the country's exchange rate will depreciate. Hence, export volume will rise and import volume will fall as a result of the depreciating exchange rate; the product market improves as the balance of payment (BOP) also improves giving rise to both internal and external balance.

Empirical Review

Victor and Samuel (2012) in assessing the relationship between the real exchange rate and inflation in Nigeria found that there is a long run relationship between inflation and the real exchange rate. The speed of adjustment indicated by the error correction model conducted in their studies further supports this long run relationship. The result showed that both domestic and imported inflation

appreciated as the real exchange rate depreciated and the ARCH result indicates the persistence of volatility between the rate of inflation and the real exchange rate, an indication that the real exchange rate in Nigeria has been susceptible to fluctuation in the rate of inflation over the years. They recommend that since imported inflation is one of the major causes of real exchange rate volatility, policies to stabilize real exchange rate by targeting inflation should be combined with policies to increase export and production of previously imported inputs to reduce the problem of imported inflation.

Imimole and Enoma (2011) investigated the impact of exchange rate depreciation on inflation in Nigeria for the period 1986–2008, using Auto Regressive Distributed Lag (ARDL) Co integration Procedure. The result revealed that exchange rate depreciation, money supply and real gross domestic product are the main determinants of inflation in Nigeria, and that Naira depreciation has positive, and significant long-run effect on inflation in Nigeria. This implies that exchange rate depreciation can bring about an increase in inflation rate in Nigeria and that inflationary rate in Nigeria has a lagged cumulative effect. They recommended that Naira depreciation policy should be combined with other macroeconomic policies to stabilize the volatile inflationary rate in Nigeria. However, their work could not fully address the pre-SAP period when exchange rate was relatively stable overtime, may be because at this time, it was not freely floating.

Adelowokan (2012) considered the interest and inflation rate channels of exchange rate pass through (ERPT) in Nigeria applying the ordinary least squares estimation procedure and using annual data for the period 1970 to 2010. The study couldn't find any evidence of ERPT to inflation in Nigeria during the period as neither the exchange rate of the Naira vis-à-vis the US dollar nor could its lagged value influence consumer prices. However, it found evidence of the pass-through effect to interest rates. However, Adeyemi and Samuel (2013) investigated the ERPT to consumer

prices in Nigeria using the VECM approach and data for the period 1970 to 2008. Results from their impulse response functions (IRF) analysis indicated considerable degree of ERPT to consumer prices in Nigeria, amounting to about 83 per cent in the long term. The study showed that the exchange rate was more important in explaining the rising inflation in Nigeria than money supply.

However, other studies such as Melolinna (2015) used a non-structural model (Factor-Augmented Vector Auto regression framework) in explaining the factors that are accountable in explaining inflation dynamics for United Kingdom and Euro area. The study contends that while demand side shocks are considerable in explaining inflation dynamics there is evidence, of exchange rate effect in driving changes in the headline inflation in the countries. This study, therefore, underlines the importance of the open economy version of the NKPC especially for small open economy.

Empirical evidence of inflation dynamics from developing economies were reported in Bawa, Abdullahi and Ibrahim (2016) as cited in Usuman etal and Addo (2016) for Nigerian and Ghanaian economy respectively. Both studies highlight evidence of persistence and the role of exchange rate in explaining inflation dynamics. Earlier study on Africa in Ayubu (2013), incorporates exchange rate in explaining inflation in the case of Tanzania. The case of Asia and Middle-east were reported in Kulatunge (2017) who documented evidence for Sri Lanka, Manopimoke (2018) report for 114 Inflation Dynamics and Exchange Rate Pass-Through in Nigeria: Evidence from Augmented Nonlinear New Keynesian Philips Curve

Adekunle and Ajao (2018) as cited in Usuman and Sanusi (2019) in their study reports that exchange rate pass-through in Nigeria is incomplete. But, the study argues that a pass-through to

domestic price increasingly becomes larger particularly when the asymmetric effect of exchange rate is considered. The study also emphasizes the relevance of adaptive expectation in explaining inflation in Nigeria. It is worthy to note that the divergence between this evidence with earlier studies is because of differences in the way inflation is modeled. This means there is a substantial difference in the size of the exchange rate pass-through when inflation is approximated through linearization and when other sources of nonlinearity are considered (Chuku, Atan and Obioesio, 2017)

Thailand and Almounsor (2010) as cited in Usuman & Sanusi (2019) specifically studied the case of Yemen. Others are Bekiros et al. (2017) whose studies provided cross country evidence from Asia. All of the Asian and Middle-east evidences suggest exchange rate as a strong factor in explaining inflation dynamics. This strand of literature, therefore, reinforces the evidence that inflation dynamics in developing economies are better explained by external shocks that are transmitted through exchange rate value of local currencies of these countries. More so, in the case of Thailand and Nigeria, the structural single equation appears to be strong in explaining inflation dynamics (Bawa et al., 2016 and Manopimoke, 2018).

METHOD OF STUDY

The data used essentially for this study is mainly annual time series data collected from secondary sources covering from 1986 to 2022 (36years). The choice of the period is

important as it covers the, SAP, and Post SAP era which resulted in massive depreciation of the naira which is suspected to have influenced the rate of inflation in study area. The data were collected from Central Bank of Nigeria Statistical Bulletin various issues.

Model Specification

This study focused on the impact of exchange rate depreciation on inflation rate in Nigeria by using official inflation rate as the dependent variable while real exchange rate, import and interest rate were used as the explanatory variables. The interest rate added was used as control variable. Aside the choice of these variables the study also extended the period 1986 to 2021. The period 1986-2021 witnessed a lot of changes in exchange rate, import and inflationary policies. Thus, the model is specified as:

INFR = F(EXR + INTR + IMP)……1

Where;

EXR = Exchange Rate
INFL = Inflation Rate
INTR = Interest Rate
IMP = Imports
Based on equations (1) the explicit econometric forms of the models are stated as:

$INFR = \Phi_0 + \Phi_1 EXR + \Phi_2 INTR + \Phi_3 IMP + U_t$ ……2

Since the variable are in rate expect import, a semi logging was conducted making import to be in log form as:

$INFR = \Phi_0 + \Phi_1 EXR + \Phi_2 INTR + \Phi_3 LIMP + U_t$ …….3

Where;
LIMP is the Log of Import
Φ_0 is the Intercepts

Φ_1,Φ_2 andΦ_3 are the coefficients of the explanatory variables
Ut is the Error terms

INFR.EXR, INTR and LIMP are as earlier defined

Thus, a priori expectations are $\Phi_1,\Phi_2,\Phi_3 < 0$

Results

Table1. Unit root test result

	At level		1st difference		
Variable	P-value(5%)		P-value(5%)	Rank	Remark
INFR	0.0181		-	Stationary	1(0)
EXR	0.9995		0.0076	Stationary	1(1)
INTR	0.0812		0.0000	Stationary	1(1)
LIMP	0.0152		-	Stationary	1(0)

Source; Author's compilation from E-view 9.0

The unit root test result as presented using table one shows that the variables are having different order of integration. The test was conducted to ascertain the properties of the time series data used for the analysis to avoid using spurious data in the investigation.

Table 2. ARDL Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
INFR(-1)	1.367167	0.199281	6.860493	0.0000
INFR(-2)	-1.599269	0.264114	-6.055232	0.0001
INFR(-3)	0.967143	0.248362	3.894082	0.0021
INFR(-4)	-0.727761	0.244374	-2.978060	0.0115
EXR	0.040719	0.100145	0.406606	0.6915
EXR(-1)	-0.091883	0.166349	-0.552349	0.5908
EXR(-2)	-0.188346	0.178450	-1.055455	0.3120
EXR(-3)	-0.198683	0.173662	-1.144079	0.2749
EXR(-4)	0.265626	0.139102	1.909583	0.0804
INTR	0.163664	0.550826	0.297124	0.7715
INTR(-1)	0.930998	0.705179	1.320230	0.2114
LIMP	21.23044	9.701515	2.188364	0.0492
LIMP(-1)	-25.26817	7.724815	-3.271039	0.0067
LIMP(-2)	34.11283	11.59072	2.943117	0.0123
LIMP(-3)	-25.45417	7.486935	-3.399813	0.0053
C	-18.75349	28.78216	-0.651566	0.5270
F-statistic	8.114629	Durbin-Watson stat		2.649057
Prob(F-statistic)	0.000395			

Source; Author's compilation from E-view 9.0

The result as presented using table 2 revealed that exchange rate at zero lag has positive and insignificant effect on inflation rate given the coefficient value 0.040719 and the p-value 0.6915. But it has negative and insignificant effect on inflation at first, second and third period lag given

the coefficients -0.091883, -0.188346 and 0.198683 the p-values 0.5908, 0.3120 and 0.0804 respectively. The result also indicated that import has positive and insignificant effect on inflation given the coefficient 0.163664 and p-value 0.7715. But at first period lag it has negative and significant effect on inflation given the coefficient value-25.26817 and the p-value 0.0067.

The result shows that the coefficient of multiple determinations R^2 value of 0.910260 which implies that 91% of the variation in the explained variable is accounted for by the changes the explanatory variables. The value of F-statistic 8.114629 and the P-value of 0.000395 which is less than 0.05% critical value shows that the explanatory variables exacts significant joint influence on the explained variable. The Durbin-Watson DW statistic value 2.649057 which is greater than 2 is an evidence of the absence of first autocorrelation in the model.

Table 3. ARDL Bound Test Result

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	4.323909	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source; Author's compilation from E-view 9.0

The bound test result as presented using table 3 show that the F-statistic value is 4.323909 which is less than the upper bound value at 5% critical value of 4.35. The result therefore shows that the variables are not co integrated. The null hypothesis which states that there is no long-run relationship is accepted.

Table 4. Short-run Form Result

Variable	Coefficient	Std Error	t-statistic	Prob
D(INTR(-1)	1.359887	0.283054	4.804333	0.0004
D(INTR(-2)	-0.23938	0.177559	-1.348186	0.2025
D(INTR(-3)	0.727761	0.244374	2.978060	0.0115
DEXR	0.040719	0.100145	0.406606	0.6915
D(EXR(-1)	0.188346	0.173662	1.055455	0.3120
D(EXR(-2	0.198683	0.173662	1.144079	0.2749
D(EXR(-3)	-0.265826	0.139102	-1.909583	0.0804
DLIMP	21.230445	9.701515	2.188364	0.0492
D(LIMP(-1)	-34.112834	11.590718	-2.94311	0.0123
D(LIMP(-2)	25.454175	7.486935	3.399813	0.0053
CointEq(-1)	-0.992719	0.259269	-3.828919	0.0024

Source; Researcher's compilation from E-view 9,0

The short-run form coefficient test revealed that exchange rate at zero, first, second period lags respectively has positive and insignificant effect on inflation given the coefficients 0.040719,0.188346,0.198683 and the p-values 0.6915 and 0.3120 respectively. The log of import at zero lag has positive and significant impact on the explained variable given the coefficient value 21.230445 and the p-value 0.04. On the other hand at the first period lag it has negative and significant effect on the explained variable given the coefficients -34.112834 and the p-value 0.0123. It is equally noted that at the second period lag LIMP has negative and significant effect on the explained variable given the coefficient value 25.45175 and the p-value 0.0053.

Table 5.Pairwise Granger Causality Test Result

Null Hypothesis	Obs	F-Statistic	Prob

EXR does not Granger Cause INFR	34	2.13522	0.1364
INFR does not Granger Cause EXR		0.60101	0.5549
LIMP does not Grange Cause INFR	30	5.16244	0.0133
INFR does not Granger Cause LIMP		0.77049	0.4735

Researcher's Compilation from E-view 9.0

The Granger causality test result revealed that there is no directional causality between exchange rate and inflation rate. On the other hand the result revealed that import Granger causes inflation rate but inflation does not Granger cause import which implies one way directional causality.

CONCLUSION

The study empirically investigated the effect of exchange rate depreciation and import on inflation from 1986 to 2021.. To achieve this objective, both ARDL Bound Test and Granger Causality test were used in analyzing the time series data collected. The results reveals that the explained variable does not have any long-run relationship with explanatory variables. In the short-run EXR has a negative and insignificant impact on INFR at 5 percent level; IMP has positive and an insignificant impact on INFR at 5 percent level. The Pair-wise Granger causality test indicates that EXR neither Granger cause INFR nor INFR Granger cause EXR. It rather revealed that IMP Granger cause INFR while INFR does not Granger cause IMP.The study therefore concludes that exchange rate (EXR) and import (IMP), impacts on inflation rate within the period under review.

5.2 RECOMMENDATIONS

Based on the research findings, the following recommendations are made;

1. That there is great need for government to encourage people to consume locally made goods as a way of averting imported inflation in the country.

2. There should be stable management of exchange rate policy that will help reduce the continuous depreciation of naira as it may trigger over supply of domestic currency.

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