

Inflation Target, Exchange Rate Pass -Through in Nigeria: Evidence from Time Series

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Abstracts

The influence of external shocks and strong correlations between exchange rates and price necessitate the need for all-encompassing study on exchange rates pass – through and its implication on inflation target in Nigeria. The research aimed to investigate the direct and indirect effect of exchange of exchange rates pass through in for the periods of 1985 to 2016, using vector error correction model (VECM). Our data shows the presence of unit root at level but after taking first difference it become stationary using ADF and PP statics, however, by employing Johansen test of co integration we found variables are co integrated, hence having long run relationship. Similarly our findings show that error correction term (ECM) is correctly sign and significant approximately 63 percent is corrected to converge towards equilibrium within first year. We further employed impulse response function and variance decomposition to examine the degree of pass-through on price in Nigeria and evidence from findings reveal that pass through on import price is greater than that on consumer prices consistence with the previous finding. We have identify the influence of exchange rate is modest and incomplete and has serious implication with the regard to formulation and implementations of monetary authorities in Nigeria. It was therefore recommended due to continues integration in the world market, it become necessary to control imported inflation since effect on consumer price in the Nigerian economy is apparent. This will reduce cost of production and stabilize domestic price thereby increase profit margin, employment and then improving standard of living.

Key words: Exchange rate, Johansen test of co integration, VECM, impulse Response.

1 Introduction

Exchange rate pass-through can be view as the degree of sensitivity of import prices to a one percent change in exchange rates in the importing nation's currency. Peter (2003) defined (EPT) the effect of a change in the exchange rate to domestic prices as results of the changes by authority concern. According to Aliyu (2007), when balance-of-payments EPT assume a

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one-for-one response of import prices to exchange rates, which is known as complete exchange rate pass-through while a less than one-to-one response is known as partial or incomplete ERPT. This has serious implications for the effect of monetary policy on domestic prices as well as for the transmission of macroeconomic shocks and the volatility of the real exchange rate especially when it's incomplete. ERPT has long been debated in the empirical literature; in the early 1980s the focus was on the industrial countries emphasized the role price discrimination across the globe, however, more recent work and debates center around appropriate impacts of exchange rates on macroeconomic stability, international transmission shock, and the degree of capital mobility.

Generally, three most important factors may determine the extent of pass-through of exchange rate to domestic prices: the pricing behavior by exporters in the producer countries, the responsiveness of mark-ups to competitive conditions and the existence of distribution costs that may drive a wedge between import and retail prices Aliyu (2007). Most important factors the size of the export market and the degree of competition the exporter faces in that market. All things being equal the higher the export market, competitive exporting firms are often willing to absorb a proportion of the exchange rate change so as not to lose market share, but this is only rarely happen in developing nations.

Following the sharp depreciation of Nigerian currency as a result recent changes in oil price in 2014, there is possibility of rises in price especially in long run, evidence from capital market has shown that many investors have lost confidence to invest in the nation's economy, and therefore, the reliability and effectiveness of exchange rate can reasonably doubt. This changes (depreciation) revealed that the naira exchange rate depreciated by 21 percent between November 2014 to date and its eminent that, the pressure should have serious effects on both demand and supply factors. The question is that are what would be the extent and magnitude of exchange rate pass-through on macroeconomic performance and its implications on inflation target on the monetary policy transmission mechanism. Given the current reality it becomes imperative to assess the impact of exchange rates on domestic price and its implication on Nigerian Economy particularly the current aimed of inflation target under medium term framework under flexible exchange rates regime. The research will therefore aim to assess the effect of exchange rates pass – through, extent and speed in Nigeria for the periods of 1985 to 2014 using time series analysis.

The paper is constructed as follows: apart from introduction in section one, section two provides some the literature reviews, section three will employ methodological framework, the VECM framework, while section four dwell for estimation and analysis and section five conclude main findings and draws a policy recommendations.

2 Literature Review

Substantial literature exists on the linkages between exchange rate and other macroeconomic indicators among the developed and developing countries. But still there is no consensus on the specific meaning of the exchange rate pass through, in the literature; Istrefi et al. (2007) identify two important meaning ETR. According to him, "ERPT refers to the sensitivity of country's merchandise import prices to changes in its currency's foreign

exchange value, after properly controlling for other factors that may influence the evolution of import prices". "Secondly, it can be view as the sensitivity of a country's consumer prices

to changes in its import prices. However, there is no consensus on the important attached to the second meaning by the previous studies. Towards the end of 1960s and early 1970, the empirical study on EPT has been extensively carried on the basis of monetary model of open economy which was premise based on purchasing power parity. But still large empirical test found no support on these models which led to the thinking that exchange rate movement is not fully reflected in price changes thereby incomplete especially in developing country hence, numerous models are now found to use in explaining exchange rate movement both from micro and macro basis.

2.1 Exchange Rate Regimes in Nigeria

Nigerian economy over the years especially in early 1970s depends heavily on oil receipts. The revenue collected from oil and non-oil sectors provide a growth impulse and exchange rate volatility in Nigeria, statistical figure shows that crude oil production account to about 80% of government revenue in Nigeria. The 1970s oil boom periods and persistence increased of crude oil production and its revenue leads increases in the demand of foreign exchange in Nigeria this has continue until 1980s during the foreign exchange crisis. Following the implementation of structural adjustment programs (SAP) in 1980s, there was indication of Naira depreciation from N 0.935 to \$ 1.00 in 1985, this was persistently increases N131.50 to \$ 1.00 (US dollar) in 2008and continue N 185 per USD in 2014. Despite the fact that different policies was set in within the economy to stabilizes exchange rates still the exchange rates movement, still this has no being sustainable one as its clearly believed parallel exchange rates dominated most of the exchange rates price determination. Nigeria witness two types of exchange rates regimes since the establishment of CBN by the act in 1958, these are:

2.1.1 Fixed Exchange Rates Regimes

Fixed exchange rates system is a system where the country government or monetary authority sets exchange rate of its currency Olusola (2009). This can be set against currency against some currency baskets of major trading nations. Nigeria fixed exchange rates system peg its currency against Great Britain Pound towards the end of 1960s this was sustain over long periods of time.

However, with discoveries of crude oil in commercial quantities and dropped of oil price in 1980s, the regimes is not be sustainable one.

2.1.2 Flexible Exchange Rates Regimes

The aimed is that exchange rates are determined by the traditional forces of demand and supply. But it was identify there are many factors determining the exchange especially in the

global economic environment. Following the IMF underline rules and regulation, Nigeria adopted flexible exchange rates in 1986. The implications of this Nigeria currency (Naira) was thought to be overvalued, this implies when a country exchange rate depreciates, any balance of payment problems will tend to be rectified by changes in the exchange rate.

Therefore, Nigeria would be able to deal with the balance of payment problem through floating exchange rates. However, there is no time Nigeria has completely floated its currency in the foreign exchange rates Olusola (2009).

According to Aliyu (2009) CBN has over the used monetary targeting to achieve price stability using different types of instruments but still monetary authority faces challenges in maintaining price stability, particularly due to the statutory allocations to the three tiers of government and the monetization of the excess crude profits, among others. For instance in 2006 minimum rediscount rates (MRR) was introduced to adjust inflation this was shortly succeed up to 2007, it was later dropped and monetary policy rates (MPR) was letter introduced to take into account of price stability in the country. However, the objectives of exchange rate policies have remain on maintaining exchange rate stability since 1980s. The RetailDutch Auction System (RDAS) which preceded the Wholesale Dutch Auction System (WDAS) have been used by the Bank to achieve such measures in the foreign exchange market and control exchange rate volatility but this has not fully attained.

Substantial study has been put in place in the area of ETP across the globe using different method covering different time horizon. Among of these studies include: Goldberg (2004), Hamid et al. (2003), Wattanakanoon(2011), Hamori et al. (2003); Jambo (2014); Jabara (2009); Isrefi (2007); Kun et al. (2013); Ezezew(2014) and Lafleche (1996) among others, most of the findings from these studies can be summarized as: The exchange rate pass-through estimates were found to be low approximately 0.47 for all imports excluding oil and 0.26 for consumer goods over 4 quarters in US, and bilateral exchange- rate pass-through range from 0.59 for Latin America to 0.0 for the NIEs; exchange rate pass through were found to be incomplete in four East- Asian countries, however, the degree of pass through were found to be high on import price than consumer price under the periods of the reviews; dynamic pass-through elasticity were found to be 0.2 and still puts exchange rate as a potentially important source of inflation but incomplete in Malawi; but exchange rates were found to be weak in east African Community; evidently partial pass through in 23 OECD countries in short run but its fully in long run and that countries with higher rates of exchange rate volatility are also those with higher pass through elasticity's in Latin America; in Thailand pass through account for 4.7 percent from exchange rate to price level and the error of the deviation from the actual value of inflation will be corrected by 14.06 percent in each period; real shock play dominants role as driving forces in exchange rates fluctuation and that flexible exchange rates may be preferable as exchange rates regimes in sub-Saharan Africa and contrary from previous finding indicates exchange rates pass through were found to complete in Albania.

In Nigeria however, similar studies have focus on the exchange rates pass through among which are; AdeyeminOgundipe (2013), Smet et al. (2002); Aliyu (2008); The result of the long-run analysis indicated that a 10.0 per cent permanent increase in crude oil prices increases the real GDP by 7.72 per cent, similarly a 10.0 per cent appreciation in exchange rate increases GDP by 0.35 per cent; Their finding reveals that the exchange rates elasticity

is 0.54 per cent in the long-run, due to a percent change in oil price volatility, while it appears to be 0.02 per cent in short run.

3 Research Methodology

The focus of the research is to investigate exchange rate pass through with the particular reference to Nigeria using vector error correction (VEC) methodology. The research is different from previous study considering time periods and methodological framework.

Vector autoregressive model (VEC) originates from reduced form VAR model. The unrestricted VAR stated each variable is a linear function of its own past values and past values of all other variables. A reduced form VAR of order p in levels of the variables can be expressed as follows:

$$y_t = \Omega + \Phi_1 y_{t-1} + \Phi_2 y_{t-2} \dots \Phi_p y_{t-p} + B\mu_t \quad 3.1$$

Where y_t is an $(n \times 1)$ vector of endogenous variables such that $y_t = (y_{1t}, y_{2t}, \dots, y_{nt})$; Ω is the vector constant; Φ_i is an $(n \times n)$ matrix of coefficients of lagged endogenous variables ($\forall i = 1, 2, 3, \dots, p$); B is an $(n \times n)$ matrix whose non-zero off-diagonal elements allow for direct effects of some shocks on more than one endogenous variable in the system; and μ_t are uncorrelated or orthogonal white-noise structural disturbances i.e. the covariance matrix of μ_t is an identity matrix $(\mu_t, \mu_t') = 1$. Equation (3.1) can be rewritten in compact form as:

$$y_t = \Omega + \Phi(L) y_{t-i} + B\mu_t \quad 3.2$$

Where $\Phi(L)$ is an $(n \times n)$ finite order matrix polynomial in the lag operator L . It should be noted that there exist a two method of identification in VAR framework, one among the method is to use variance-covariance matrix of the VAR framework by applying triangular process this can be done by applying a Cholesky decomposition to the variance covariance matrix of the reduced form residuals μ_t Aliyu (2009).

3.1 Data Sources and Description

The research utilizes annual data for the periods of 1985 to 2015. The data was extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau Statistics (NBS) various issues. The variable includes the real effective exchange rates (er) which reflect the value of naira in United States Dollar after adjusted to inflation by taking three years moving average. It included as a policy instrument since depreciation or appreciation has direct and indirect effect on consumer price. The real value of imports of goods and service (imp), the price is measure by whole sale consumer price index (CPI), capital inflow proxies by foreign direct investment (FDI) as a result of degree of openness of Nigeria to external sector, the traditional proxies of real gross domestic product GDP scale variable is used as a measure of transactions relating to economic activity(Y), short term interest rates (str), and international oil price proxied oil price index in US dollar (OILP) due to crucial role of oil price in Nigerian economy, All variable are transform in to log form to measure the degree of elasticity of pass through.

3.2 The Econometric Model Building

The research will firstly start by diagnostic checking the time series properties of the data generating processes using the Augmented Dickey Fuller (ADF) and Phillips and Perron (PP) tests to identify whether the mean and variance of data are constant (stationary) or fluctuates over periods of time, this will provides the basis of establishing long run properties of the variables used in the model(co integration) in order to avoid the problem of spurious regression. A principal feature of cointegration variables is that their time path are influenced by the extent of any deviation from long run equilibrium, after all if the system is to return to the long run equilibrium the movement of at least some of the variables must respond to the magnitude of the disequilibrium (welter 2012). In short two or more variables are said to be co integrated if they exhibit co-movement in the long run. The test will start by assuming that Y_t follows a pth order autoregressive process.

3.2.1 Vector Autoregressive Model

The equation 3.1 in VAR model can be re-written in VEC approach as;

$$\Delta y_t = \lambda_1 + \sum P^{-1} \Gamma_i y_{t-1} + \Pi y_{t-p} + \varepsilon_t \dots \dots \dots 3.2$$

Δ is first difference lag operator, y_t denotes $(n \times 1)$ matrix of the random variables included in the model having stationarity properties of $I(1)$. While λ_1 is the vector constant coefficient and ε_t is the vector of white noise process and contains information regarding the short-run relationships among the variables. The matrix Π denotes the long-run information contained in the data. It is the rank of $\Pi = \psi\beta$, β the matrix of co integrating vectors; the elements of ψ are known as the adjustment parameters in the vector error correction model. The rank implies that variables are co integrated using the maximum eigen values and trace statistics test which will be adopted in the presence research.

3.3 Model Specification

$$E r = \beta_0 + \beta_1 imp + \beta_2 cpi + \beta_3 y + \beta_4 oilp + \beta_5 fdi + \beta_6 str + \mu_t \dots \dots \dots 3.7$$

The expected sign of the coefficients are: $\beta_3, \beta_4, \beta_6 > 0$, and β_1, β_2 and $\beta_5 < 0$.

4 Result And Discussion

4.1 Unit Root Test

The result for unit test is presented in table 1.1 using ADF and PP test both in level and first differences with the constant and trend. The test therefore shows FDI is stationary at level; hence it can also be stationary after taking first differences while other variables are found to be stationary after taking first differences. Thus we proceed to test co integration since

variables are integrated of the same order I (1). Similarly the AIC is utilized in the selection of the lag length and ordering of the variables, respectively.

Table 1.1: Unit Root

Variables	Level		First Differences		comments
	ADF test	PP test	ADF test	PP test	
	Statistics	Statistics	Statistics	Statistics	
ex	-2.142	2.208	-5.106 *	5.020*	I(1)
lnimp	-1.538	-2.603	-5.209 *	5.136*	I(1)
cpi	-2.140	-2.201	-5.027*	5.021*	I(1)
lny					
oil	2.25	1.411	-4.339*	-3.58**	I(1)
fdi	-2.516	-2.503	-4.490*	4.804*	I(1)
	-4.523*	-4.523*	-9.671*	10.541*	I(0)

Sources: Eviews econometrics software Version 8, (2016).

Note: *, ** indicates significance at 1and five percent level using MacKinnon critical values, And lag length was chosen based on Akaike Information Criteria (AIC).

The result from the above tables indicate that variables has a unit root at level except for (fdi), while after taking first difference it become stationary, therefore the h unit roots hypothesis is rejected at 1% and 5% and concludes are stationary respectively.

4.2 Johansen Test of Co integration

The next step is to examine the possibility of long-run relationship among these variables. We are to excess how the exchange rate volatility (depreciation) reacts in the long run on the

variables selected in the model in Nigerian context. The results from the maximum eigenvalue test indicate three co integrated equations whereas trace test suggest the existence of two co integrating equations at the 5 per cent significance level among the variables. The results of Johansen test is depicted in table 1.2 below:

Table 1.2: Johansen Test of co integration

Hypothesised No. of CE(s)	Trace Statistic	0.05 critical value	Max-Eigen Statistics	0.05 Critical value
None*	169.465	125.615	48.258	46.231
At most 1*	121.025	95.753	45.753	40.077
At most 2*	75.422	69.818	28.590	33.876
At most 3	46.861	47.856	20.658	27.584
At most 4	26.203	29.797	13.460	21.131
At most 5	12.742	15.494	12.742	14.264
At most 6	1.601	3.841		

Source: Eviews version 8, user work

4.3 Long Run Result

As the speed of adjustment coefficients provide additional base for inferring short run dynamic among these variables. If we select $r = 1$ and normalize the cointegrating vector with respect to exchange rates, then the long run equilibrium relationship can be shown as:

Table 1.3: Co integrated Coefficient equations 1 and 2

lnex	lnimp	lnpci	lny	lnfdi	lnoil	lnstr
1.000	-1.7104	-1.519	18.647	0.633	8.197	-1.224
	(0.357)	(0.397)	(2.116)	(0.254)	(0.934)	(0.567)
1.000	1.000	-0.9460	-1.745	0.747	0.484	2.471
		(0.172)	(1.074)		(0.153)	(0.536)
(0.341)						

Note: brackets indicates standard errors

From the above table we derive the cointegrating equation the exchange rates and other independent variables. The normalized equations and value is vector co integration is presented as:

$$\ln ex = -1.171 \ln imp - 1.52 \ln cpi + 18.65 \ln y + 0.63 \ln fdi - 8.19 \ln oil - 1.22 \ln str \dots \dots \dots 4.1$$

$$\ln ex = -0.95 \ln cp - 1.74 \ln y + 0.74 \ln fdi + 0.48 \ln oil - 2.47 \ln str \dots \dots \dots 4.2$$

Although equation (4.2) has important implications that cannot be discarded, we restricted the analysis on equation (4.1) because it reflects most of the theoretical expectation. The co integrating parameters in the above equation show that the explanatory variables are significant impact on exchange rates variable (the standard errors in the parentheses indicate that the coefficients are statistically significance at 5 % and 10 %. The import prices ($\ln imp$), price ($\ln cpi$), income ($\ln y$) and ($\ln oil$) is correctly sign and are significantly different from zero. All things being equal, a rise in the crude oil prices is associated with the positive effects on oil earnings in the Nigerian economy and accumulation of foreign reserve, this in turn cause an appreciation of exchange rate. Higher import prices, rises in price level and cause depreciation of the exchange rate. Evidence from findings indicates import price, oil price and price index have negative effect on the exchange rates in the model. The vector co integration coefficients reveal 1 percent change in the four variables results 1.71, 1.52, 8.7 and 1.22 percent depreciation of exchange rates. However, a 1 percent change in GDP and foreign direct investment ($\ln fdi$) by 18.6, 0.63 will yield an appreciation of exchange rate respectively. This implies as long oil prices is volatile the exchange rates in Nigeria would continue to be unstable. The negative sign of prices justifying the saying that exchange rates depreciation have effect on commodity price in long run especially in import dependent country like Nigeria.

4.4 Short-Run Analysis: A Vector Error-Correction Model (VECM)

In time series analysis a variables exhibit long run relationship is expected to have an error-correction component, showing how aquarium will converge towards short run adjustments. Therefore, we aimed to identify the effects of the estimated long-run equilibrium on the short-run dynamics. This implies whether the parameter of the error correction term is correctly sing and is significantly different from zero, (vector of exchange rates). One lags length is used as appropriately suggest by lag selection criteria, and short run dynamic of exchange rates and its determinants is examine using vector error correction model. The VEC is presented as follow:

The results from table 1.5 show error correction model is correctly sign (negative) and significance. The ECM is significance and highly significance chosen level of significance. This implies the coefficient is -0.63 suggesting about 63% disequilibrium of exchange rates is corrected in the current year under the period of investigation. Therefore, when exchange rates are above or below equilibrium, it adjusts approximately by 63% within first year to ensure equilibrium is restored. The implication with the regard to sign is that speed of adjustments is very changes in price have significance impact on exchange rates movement in short run under the period of investigation. In short run other variable are not

significance and even though the short term interest rate is correctly sign. The goodness of the adjusted R² is 47 %.

Table 1.4 VEC – short run result

Ecm(-1))	D(lnex(-1))	D(lnimp(-1))	D(lncpi(-1))	D(lny(-1))	D(fdi(-1))	D(lnoil(-1))	D(lnstr(-1))
-0.631	-0199	-0.025	-0.476	-3.026	-0.0003	-0.333	0.3198
(0.047)	(0.225)	(0.126)	(0.151)	(1.784)	(0.053)	(0.277)	(0.189)
-13.188 *	-0.88	-0.167	-3.073**	-1.69	0.006	-1.201	1.690
<i>Adj R² = 0.47 AIC = 0.4889 SC = 0.917</i>							

Note: number in the bracket is the standard error, *, ** indicates significance level at 5% and 10 % level respectively.

4.5 Impulses Responses Function

We developed impulses responses function tracing the effect of innovations from the vector endogenous variables in the VECM model. Figure 1.1 below shows the responses endogenous variables to its own and others variables. For instances the responses of exchange rates on in the short run the response of exchange rates on import is -0.6 percent, -4.3 percent in the and 9.5 percent in the long run, while EPT on price is -0.4 percent and 2.7 percent in both short run and long run, this implies 1 percent depreciation of exchange rates will lead to 60 percent and 40 percent increases in import and consumer price. Evidently the pass through on import price is greater than that on consumer prices.

Variance Decompositions

The variance decomposition helps break down the forecast variance of exchange rates into component that can be attributed to each of the various shocks tracing the relative importance of the various fluctuations. The findings from variance decomposition of exchange rate exchange rates account for 100 percent for its own shock, it further decline to 4.3 after twelve month and 2.3 percent after twenty four month. While its import price account for exchange rate fluctuation to about 69 percent of in 12 month and persistently increase to 71 percent in long run, it can also be shown the effect of price on the exchange rate fluctuation is less than that of import it account for 7 to 6 percent in both short run and long run respectively. Lastly real gross domestic product proxied as income account for 19 and 18 percent fluctuations in the exchange rates respectively. The implication of persistence increases import price variance and income indicate the dependency ration of on the import from abroad, this is in conformity with the Aliyu et al (2007) finding in Nigeria.

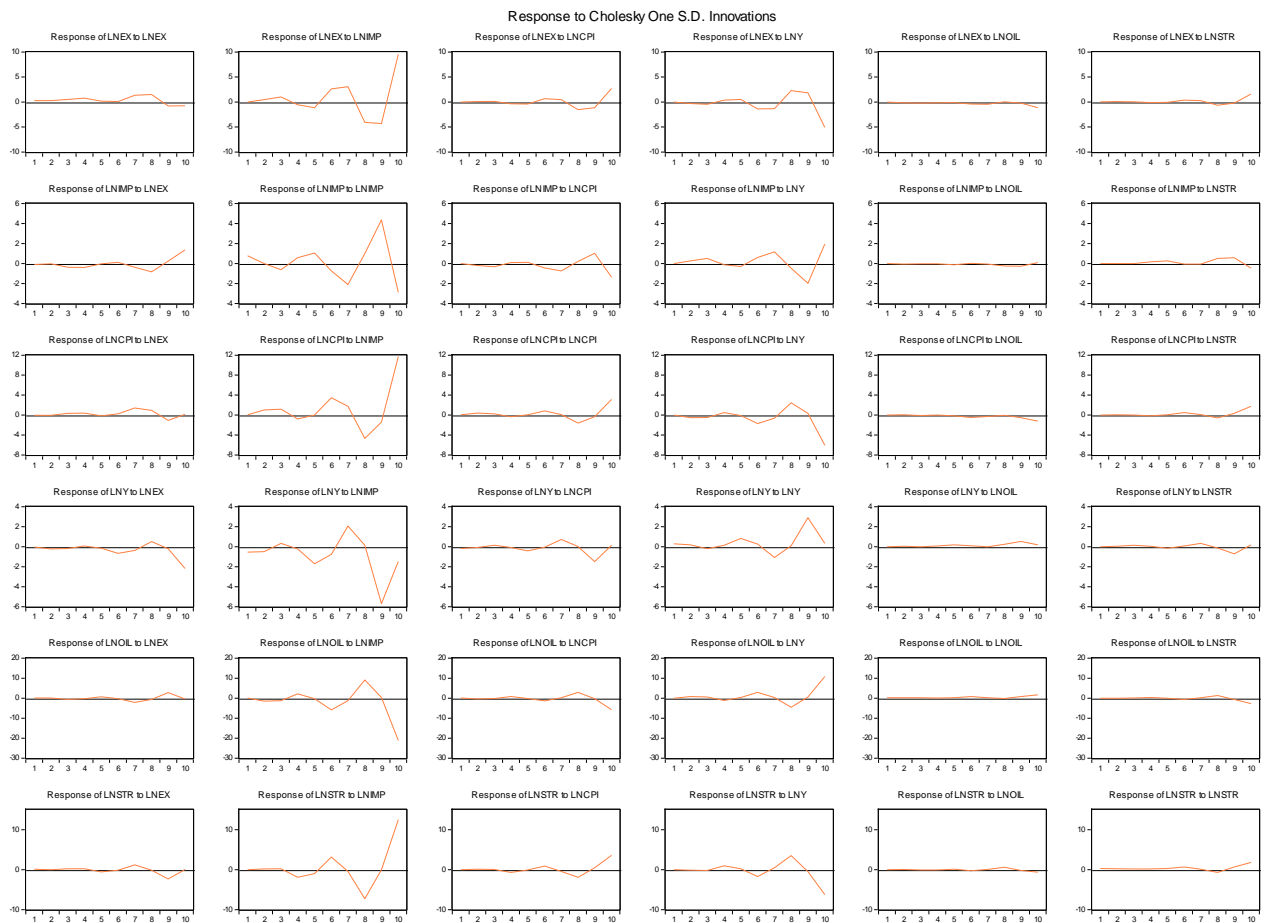


Figure 1.1: Impulse Responses

The variance decomposition of price indicates that fluctuations of consumer price index is mainly derives by the domestic price movement (its own), this implies that in short run inflation is expected by to influence by domestic price movement. However, exchange rates shock account for 35 percent of inflation variability, letter decrease 3 and 8 percent and after 12 and month respectively, this is indicates exchange rates has modest contribution on inflation in long run, that monetary authority should be serious when using exchange rates when formulating and implementing exchange rates as an instruments in stabilizing pricing. Similarly import price account for the 30 percent this also increases to 72.5 percent in the long run therefore, expecting inflation in Nigeria as result of the rises in the cost of imported inputs. The result of variance decomposition is depicted below:

5 Summary and Conclusion

Recent depreciation of exchange rate by the CBN culminates the need for extensive research about the relationship and linkages of exchange rate movement and prices in Nigerian

Table 1.5: Variance Decomposition

Variance Decomposition of Exchange rate: How does Exchange rates explain?

Time	lnex	lnimp	lnpci	lny
1	100.00	0.000	0.00	0.00
12	4.35	68.92	6.45	18.53
24	2.31	71.10	6.17	18.80
Variance Decomposition of import				
1	2.23	97.00	0.00	0.00
12	6.04	66.76	6.46	18.46
24	4.41	68.76	6.39	18.91
Variance Decomposition of consumer price index				
1	35.20	29.79	35.0	0.00
12	3.05	70.73	5.86	18.34
24	1.96	72.38	5.86	17.64

Economy. The research aimed to investigate the direct and indirect effect of exchange of exchange rates pass through. Although its main objective is to examine the degree and magnitude of ETR on domestic price in Nigeria for the periods of 1985 to 2014 using annual data.

We start by diagnostic checks of the time series characteristics of the variables to avoid the possibility of spurious regression. The ADF and PP test indicate that variables are stationary after taking first difference therefore provides the basis of test long run relationship. It was identified that there is a long run relationship among the variables; similarly the error correction term is correctly signed approximately 63 percent is corrected to converge towards equilibrium within first year. We further utilized impulse response function and variance decomposition to examine the degree of pass-through on price in Nigeria. Evidently the pass through on import price is greater than that on consumer prices consistent with the previous finding.

Equally, Nigeria being an oil exporting country, increase of crude oil prices is associated with the positive effects on oil earnings in the Nigerian economy, this in turn causes an appreciation of exchange rate. This implies as long as oil prices are volatile the exchange rates in Nigeria would continue to be unstable. One important finding from the research is that domestic policy can also be a source of inflation in Nigeria, thus concluding that price fluctuation is exposed by both external and internal shocks.

It was further recommended that the influence of exchange rate is therefore modest and incomplete, hence monetary authorities have a significant role in stabilizing consumer prices but they will exercise this with care. Furthermore, it becomes necessary to control imported inflation due to its serious and lasting effect on consumer prices in the Nigerian economy. This will reduce producer costs hence domestic increases in prices and increases in the profit margin thereby improving the standard of living.

Appendix Table A1: Diagnostic Checks

components	Skweness	Kurtosis	LM test	White Hetro.
Lnexo	0.36 (0.02)	36.21(0.321)	153.21(0.81)	
Lnimp	0.21 (0.07)			
Lncpi	0.13 (0.02)			
Lny	0.46 (0.01)			
Lnfdi	-0.11(0.12)			
Lnoilo	0.38 (0.06)			
Lnstro	0.42 (0.11)			
Joint	(0.203)	(0.801)		

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