IMPLICATION OF MONETARY POLICY RATE AND INTEREST RATE ON EXCHANGE RATE IN NIGERIA: 1981-2017.

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ABSTRACT

The study investigated the implication of monetary policy rate on exchange rate and interest rate in Nigeria, 1981-2017. In view of the above stated problems, the specific objectives are to: Investigate the effect of monetary policy rate on exchange rate in Nigeria, determine the effect of monetary policy rate on interest rate in Nigeria. The analysis of error correction and autoregressive lags fully covers both long-run and short-run relationships of the variable under study. The statistical tool of analysis employed in the study is Autoregressive Distributed Lags(ARDL) and Philips Peron method of stationary testing ans structural breakpoint unit root test., these methods were employed in order to check the stationarity and break point analysis of the time series data employed in this study. The study observed that monetary policy rate has positive and significant effect on exchange rate in Nigeria. It was also observed that monetary policy rate has positive and significant effect on interest rate in Nigeria. Overall, our results indicated that the impact of monetary policy on exchange rate was significant. There was a positive and significant relationship between monetary policy variables and exchange rate. The conclusion that is drawn from our results is that monetary policy remains an effective and potent tool to ensuring a stable exchange rate in Nigeria. The study recommended that monetary policy should be used to create a favourable investment environment by facilitating the emergence of market based interest rate and exchange rate regimes which could attract domestic and foreign investments. Second; the Central bank of Nigeria (CBN) need to avoid rdination and balance between monetary and fiscal policies to ensure smooth realization of monetary policy goals.policy inconsistency or summersault to actually determine its policy impact before contemplating a change. Finally, there should be a coo

Key Words: Monetary policy, Exchange Rate, Interest Rate, Nigeria.

1. INTRODUCTION

Exchange rate is an important macroeconomic indicator that measures international financial competitiveness and facilitate cross border transactions. Monetary policy has always been seen as a fundamental instrument over the years for the attainment of macroeconomic stability, often viewed as prerequisite to achieving sustainable output growth and price stability. Thus, in the pursuit of macroeconomic stability, the managers of monetary policy have often set targets on intermediate variables which include the short term interest rate, inflation, gross domestic product, growth of money supply and exchange rate. Among these intermediate variables of monetary policy, the exchange rate is argued to

have a greater influence on the economy through its effect on the value of domestic currency, domestic inflation, the external sector, macroeconomic credibility, capital flows and financial stability.(Owolabi and Adegbite,2014).

Monetary policy hinges on an interest rate corridor, provides for the Central bank lending facility as well as the acceptance of overnight deposit from operators at specified rates. Under Monetary Policy, the Central bank discount window could be accessed by market operators (Discount Houses and Deposit Money Banks), that are in need of funds to meet liquidity shortages and those with excess liquidity could deposit the funds overnight". (Central Bank of Nigeria, Communique no. 48, 2006).A monetary policy strategy comprises two main elements: the policy objective, including the time horizon for its attainment, and the analytical framework, which relates policy instruments and goals and provides the basis for assessing the prospects for attaining the policy objective and the associated risks (Lucas,2010). Monetary policy rate of central bank of Nigeria is the anchor for money market and other rates in Nigeria.Monetary policy is an important driver of asset prices—one category being exchange rates. Therefore, it is not surprising that financial markets focus close attention on the link between contemporaneous exchange rate dynamics and changes in short-term policy rates or long-term yields, since long-term yields can contain information about expected future policy rate (Vania and Jenny,2015).

Monetary policy rate is set by the monetary policy committee of central bank and serve as the rate central bank could give loan to banks hence the monetary policy rate announce by the committee influence cost of fund**.** In financial markets, the folk wisdom holds that a country's currency appreciates when its interest rate increases relative to that of other countries. Interest rate is a vital macroeconomic variable that directly impact on the cost of goods and services instantaneously.

The factors influencing interest rates would obviously vary with the extent of openness of the economy since forces of demand and supply determine it, for a highly opened economy with dynamic and sophisticated financial markets, the uncovered interest parity theory states that the differential between the domestic and foreign interest ratio equals the expected rate of depreciation/appreciation of domestic currency (Horobet, Dumitrescu&Dumitrescu, 2009) as contained in (Osundina and Osundina 2014)

The rest of the paper is divided into four section, section two we present literature review of related topics and findings of different authors. Section three presents the model and the methodology, followed by the results and discussion in Section four, and finally, section five presents the main conclusion and recommendations. The work studied how monetary policy and interest rate, all instruments of central bank could influence exchange rate that is completely outside the control of the central bank.

2. Literature Review:

The conceptual framework of this study is to establish the relationship between monetary policy and some macroeconomic variables. Macroeconomic factors have been shown to explain significant variation in monetary policy.Macroeconomic and political environment affects the performance of monetary policy in Nigeria.A thought-provoking issue, which has occupied the mind of economists and monetary authorities for decade is the effectiveness of monetary policy in achieving macro-economic objectives. Notwithstanding however, there is the lack of consensus among economists on how it actually works and/or the magnitude of its effect on the economy.(Imoisi,Olatunji and Ekpenyong 2013). In attempt to regulate monetary policy in the Nigerian economy, the Central Bank of Nigeria (CBN) employs various instruments which include; Open Market Operation (OMO), Reserve Requirement (RR) and Discount Rate (DR),CBN (1994).These instruments affect other macroeconomic variables that direct the movement of the economy.

Monetary policy encapsulates those decisions bordering on money supply and interest rate in a given economy. Monetary policy, in turn, can be seen as the institutional arrangements and the use of the monetaryauthority instruments in order to maximise social welfare. The overriding objective monetary policy is to maintain price and exchange rate stability by ensuring that money supply growth does not go out of control in relation to macroeconomic fundamentals. Monetary policy is concerned with discretionary control of money supply by the monetary authorities (Central Bank with Central Government) in other to achieve stated or desired economic goals.

Monetary policy got its root from the works of Irving fisher (see Diamond, 2003. P. 49) who lay the foundation of the quantity theory of money through his equation of exchange. In his

proposition money has no effect on economic aggregates but price. However, the role of money in an economy got further elucidation from (Keynes,1930 P. 90) and other Cambridge economists who proposed that money has indirect effect on other economic variables by influencing the interest rate which affects investment and cash holding of economic agents(Onyeiwu,2012).According to Manu and Sulaiman 2018 Keynesians (1936) claimed that the monetary policy may influence the aggregate demand, by modifying the money supply, which may lead to full employment, without generating inflation. Later, at the beginning of the „80s, the Keynesian theories lose credibility and to the monetary ones, held high by economists such as Milton Friedman, Kar Brunner and Alton Meltzer, who suggest that monetary regulation can stabilize economy. The neoclassic economy brings in the rational expectations theory (Cerna, 2012). Baitini N. (2004) in his study of the relationship between monetary policy and price fluctuation in Pakistan discovered that, majority of the monetary policy instruments such as OMO, RR, BR has a positive and significant impact on inflation, and recommend the monetary authority to emphasize on expanding such measures. Similarly from the CBN annual report on the operation, success and performance of monetary policy in Nigeria (2016 Bulletin) the monetary policy is one of the effective measures of ensuring relative stability in the Nigerian economy.

Exchange rate is an important macroeconomic indicator that measures international financial competitiveness and facilitate cross border transactions. Foreign exchange describes the use of convertible currencies to facilitate payment of international transactions or businesses.(CBN briefs2012/2013).

Umoru and Aisien(2014) The Monetary Policy Rate of the Central Bank of Nigeria (CBN) and the Nigerian Stock Market: A Structural Var Analysis. Examined the dynamic relationship between stock market performance and the CBN monetary policy rate between the period of 1973-2012, using all share price index in the Nigerian stock exchange as a measure of stock market performance and the official rate of interest at which the CBN lends money to money deposit banks in the country as a measure of the monetary policy rate.They used SVAR model and found that stock market performance is negatively associated with the CBN monetary policy rate in Nigeria. In effect, if the CBN monetary policy rate was high, investors would move from high risk stock market to invest in low risk bank deposits while, if the CBN policy rate is low, investors may prefer to invest in the stock exchange market. Given the peculiarities of Nigerian economy, hikes in the short term CBN monetary policy rate might be counter-productive.

Manu and sulaiman(2018) studied empirically the effectiveness of monetary policy instruments in achieving price stability in Nigeria, covering 1963-2015. Unit root test was conducted based on ADF technique, and all the variables were found to be stationary at level. The OLS result revealed that, there exist an inverse relationship between inflation (dependent variable) and some of the explanatory variables such as Monetary Policy Rate (MPR), Exchange Rate (EXCR), and Total Credit to Private Sector (TCPS). While other explanatory variables such as Required Reserve (RR) and Money Supply as a ratio of GDP (MSGDPR).

ATarere(2016) examined the influence of monetary policies on the growth of the Small and Medium Scale Enterprises. Literatures were reviewed in areas of, concept of Small and Medium Scale Enterprises, monetary policy and Influence of Monetary Policies on the Growth of SMEs. The paper is hinged on the finance-led growth theory. He revealed that monetary policies are very important in the regulation of any economic system. it was however recommended that the Monetary authority (CBN) should implement policies that increase the flow of money and direct it to sectors like SMEs with higher propensity to contribute to national economic productivity and should endeavour to make more use of the cash reserve ratio in regulating the operations of commercial banks; and interest rate policy should be such that banks can efficiently intermediate funds in the economy.

Imoisi, Olatunji and Ekpenyong (2012) examined the efficacy of monetary policy in achieving Balance of Payments stability in Nigeria. The research was conducted using an Ordinary Least Squares (OLS) technique of multiple regression models using statistical time series data from 1980-2010. The estimated result shows a positive relationship between the dependent variable (Balance of Payments) and the Independent variables (Money Supply, Exchange Rate and Interest Rate).

Onuorah and Ebiringa (2012) Studyied the impact of monetary factors on Nigeria's economic growth in the face of the challenges of excess liquidity, poor access to credit, high cost of capital, inflation, and decreasing rate of economic growth. They applied econometric modeling in the development of a prediction model for economic growth using critical indices of monetary policy. The results show that there is a significant relationship between money supply, foreign exchange rate and economic growth in Nigeria.

Jonathan and Phil (2016) investigated the impact of monetary policy on the exchange rate using an event study with intraday data for four countries. Carefully selecting the sample periods ensures that the policy change is exogenous to the exchange rate. An unanticipated

tightening of 25 basis points leads to a rapid appreciation of around 0.35 percent. We also show that the impact depends on how the surprise affects expectations of future monetary policy. If expectations of future policy are revised by the full amount of the surprise, then the impact on the exchange rate is larger (0.4 percent) than if the surprise only brings forward an anticipated change in policy (0.2 percent).

Chipote and Makhetha-Kosi (2014)Eexploreed the role played by monetary policy in promoting economic growth in the South African economy over the period 2000-2010. The study employs the Augmented Dickey-Fuller and Phillips Perron unit root tests to test for stationarity in the time series. The Johansen co-integration and the Error Correction Mechanism are employed to identify the long-run and short-run dynamics among the variables. The study shows that a long run relationship exists among the variables.

Onyeiwu(2012) examined the impact of monetary policy on the Nigerian economy. In doing this, the Ordinary Least Squares Method (OLS) is used to analyse data between 1981 and 2008. And found that monetary policy presented by money supply exerts a positive impact on GDP growth and Balance of Payment but negative impact on rate of inflation.

Kalu,Gyang,Aliagha,Alias and Onuoha (2015) Inflation has an influence on the general economic activities of the market system, and this includes the building materials market. The influence of inflation on the price of building materials results in variations in the financial planning and execution of a construction project, which hampers meeting the cost targets and maintain profit margin. It is the responsibility of government to regulate the movement of inflation through the use of Monetary Policies. The monetarist economists argue that the major cause of inflation is the increase in the supply of money in circulation. The Monetary Policy being the principal tool used by the government for price stabilization in mind, this study aims to examine the relationship between the inflationary rates and prices of building materials in the face of Monetary Policy. The study covers a period of ten years and considered twenty-four (24) major construction materials.The result shows that there is a significant relationship between the movement of the Monetary Policy Rate (MPR) and the inflation rate. A regression model of y=6894+0.314x, which imply that MPR controls price fluctuation in the general economy, this was not the case with the prices of building materials investigated.

GOLDFAJN and GUPTA(2003) provides evidence on the relationship between monetary policy and the exchange rate in the aftermath of currency crises. It analyzes a large dataset of currency crises in 80 countries for the period 1980–98. The main question addressed is

whether monetary policy can increase the probability of reversing a post crisis undervaluation through nominal appreciation rather than higher inflation. They found that tight monetary policy facilitates the reversal of currency undervaluation through nominal appreciation. Obi,Osigwe and Madichie (2015) examined the relationship and causality that exist between remittance inflows exchange rate and monetary aggregates - money supply, interest rate, and the domestic price level in Nigeria using Johansen co integration and the Granger causality techniques were employed. The Johansen co-integration test indicated that long run relationship exist among the variables. The Granger causality test results revealed a unidirectional causality running from money supply (LM2) to remittances (LREM) only at lag one and not in the reverse. In other lags, there was no evidence of causality between the duos. The results also showed that, consistently from lag one to lag five, causality run from exchange rate (LEXR) to LREM and not in reverse direction. Unidirectional causality run from interest rate (INT) to LREM, occurring from lag one to lag four. There was no evidence of causality in any direction between inflation rate (INF) and LREM within these lags. We also found that causality run from exchange rate (LEXR) to money supply (LM2) only at lags one and four and not in the reverse order

Morales and Raei (2013) Examined The Evolving Role of Interest Rate and Exchange Rate in the Monetary Policy Transmission in the East African Community andfound that this is indeed the case, particularly in Kenya and Uganda where interest rate and exchange rate channels have gained significant prominence over time. In fact, before the recent episode of tightening in Kenya and Uganda, transmission may have been difficult to detect. By focusing on the evolution of transmission over time, the paper highlights challenges in the study of monetary transmission in low income countries and reconciles seemingly contradictory empirical studies conducted over different time periods.

Sonali (2015) Investigated Monetary Policy in India: Transmission to Bank Interest Rates Using stepwise estimation of vector error correction models, the analysis finds significant, albeit slow, pass-through of policy rate changes to bank interest rates in India.There is evidence of asymmetric adjustment to monetary policy: the lending rate adjusts more quickly to monetary tightening than to loosening. In addition, the speed of adjustment of deposit and lending rates to changes in the policy rate has increased in recent years.

Adigwe, Echekoba and Onyeagba(2015) Explored the impact of monetary policy on the Nigerian economy. Ordinary Least Square Method (OLS) was adopted to analyse the data for the period 1980 and 2010. The result of the analysis shows that monetary policy represented by money supply exerts a positive impact on GDP growth but negative impact on the rate of inflation.

Fasanya,Onakoya and Agboluaje (2013)Studied examines the impact of monetary policy on economic growth in Nigeria.They used time-series data covering the range of 1975 to 2010.The effects of stochastic shocks of each of the endogenous variables are explored using Error Correction Model (ECM). The study found that Long run relationship exist among the variables. Also, the core finding of this study shows that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria.It is therefore recommended that the establishment of primary and secondary government bond markets that can also increase the efficiency of monetary policy and reduce the government's need to rely on the central bank for direct financing.

Emerenini and Eke(2014) investigated impact of monetary policy rate on inflation in Nigeria using a monthly data from January 2007 to August 2014. The ordinary least square (OLS) method was adopted because of its best linear unbiased estimator (BLUE) property. The result showed that expected inflation, exchange rate and money supply influenced inflation, while annual treasury bill rate and monetary policy rate though rightly signed did not influence inflation in Nigeria within the period under investigation. The estimated model displayed that all the explanatory variables used for the analysis accounted for 90% variation in explaining the direction of inflation as regards to increase or decrease. The co-integration test showed that a long term relationship existed among the variables and they were stationary at order one I (1).

Ayodele (2014) examined the effect of monetary policy on commercial bank lending in Nigeria between 1988 and 2008 Using, Vector Error Correction Mechanism of Ordinary Least Square econometric technique as the estimation method. The findings indicate that there exists a long run relationship among the variables in the model. Specifically, the findings revealed that exchange rate and interest significantly influenced commercial banks lending, while liquidity ratio and money supply exert negative effect on commercial banks'

loan and advances. The major conclusion drawn is that monetary policy instruments are not effective to stimulate commercial bank loans and advances in the long-run, while banks' total credit is more responsive to cash reserve ratio. Thus, monetary authority should make efforts to develop indirect monetary instruments and exercise appropriate control over the monetary sector.

Kuttner (2000) examined the impact of monetary policy actions on bill, note, and bond yields, using data from the futures market for Federal funds to separate changes in the target funds rate into anticipated and unanticipated components. Bond rates' response to anticipated changes is essentially zero, while their response to unanticipated movements is large and highly significant. Surprise policy actions have little effect on near-term expectations of future actions, which helps explain the failure of the expectations hypothesis on the short end of the yield curve.

Goodfriend and Mccallum (2007) Considered the role of money and banking in monetary policy analysis by including a banking sector and money in an optimizing model otherwise of a standard type. The model was implemented quantitatively, with a calibration based on U.S. data. They found a differential of over 3 % pa between (iii) and (iv), thereby contributing to resolution of the equity premium puzzle. Dynamic impulse response functions imply pro-or-counter-cyclical movements in an external finance premium that can be of quantitative significance.

David K, Federico, Chris and Stanley(2010) Examined Monetary Policy and the Uncovered Interest Rate Parity PuzzleHigh interest rate currencies tend to appreciate. This is the uncovered interest rate parity (UIP) puzzle. It is primarily a statement about short-term interest rates and how they are related to exchange rates. Short-term interest rates are strongly affected by monetary policy. The UIP puzzle, therefore, can be restated in terms ofmonetary policy. Do foreign and domestic monetary policies imply exchange rates that violate UIP? We examine different specification for the Taylor rule and ask which can resolve the UIP puzzle. We examined evidence in favour of a particular asymmetry. If the foreign Taylor rule responds to exchange rate variation but the domestic Taylor rule does not, the model performs better.A calibrated version of our model is consistent with many empirical observations on real and nominal exchange rates, including Fama's (1984) negative correlation between interest rate differentials and currency depreciation rates.

Bjørnland (2008) Investigated transmission mechanisms of monetary policy in a small open economy in Norway using structural VARs, with special emphasis on the interdependence between monetary policy and exchange rate movements. By imposing a long-run neutrality restriction on the real exchange rate, thereby allowing the interest rate and the exchange rate to react simultaneously to news, he found considerable interdependence between monetary policy and the exchange rate. In particular, following a contractionary monetary policy shock, thereal exchange rate immediately appreciates, after which it gradually depreciates back to the baseline. The results are found to be consistent with findings from an "event study".

Stavrakeva and Jenny(2015) Examined exchange rates and monetary policy and found that monetary policy surprises and changes in expectations about future monetary policy can explain a sizable fraction of the variation in exchange rate changes for certain currency pairs. However, our results show that expected excess returns account for most of this variation. We also find that the importance unconventional monetary policy plays for explaining exchange rate changes is larger in the period since the United States hit the zero lower bound in December 2008.

Clarida (2017). Examined Global Factor in Neutral Policy Rates Some Implications for Exchange Rates, Monetary Policy, and Policy Coordination**.** Using a standard two country DSGE model, we derive a structural decomposition in which the nominal exchange rate is a function of the expected present value of future neutral real interest rate differentials plus a business cycle factor and a PPP factor. We document a novel empirical regularity between the equilibrium error in the VECM representation of the empirical Holston Laubach Williams (2017) four country model and the value of the nominal trade weighted dollar.
Marta, Peter, and Anita (2004) examined monetary policy in Albania during the transition period. Various channels through which monetary policy can affect prices and output are identified and their relative importance is assessed. Estimates from a vector autoregression model (VAR) of key macroeconomic variables demonstrate the weak link between money supply and inflation up to mid-2000.
Jaehan, and Sangheon (2014)Examined the dynamic relationship among real activity, inflation, interest rates and stock returns in the post-war period from 1947 to 2008 by employing a recursive vector autoregression (VAR) model. They found no significant relationship between real stock returns and inflation, supporting the Fisher effect that common stocks are hedges against inflation. They also investigated the effects of changes in

the Federal Reserve's monetary policy rule by comparing the response of interest rates to inflation between two sub-periods: pre-1980 period (1947 – 1979) and post-1980 period (1980 – 2008). They further found that real interest rates absorb inflation shock much more quickly in the post-1980 period than in the pre-1980 period, the evidence supporting the well-known fact that the Federal Reserve more aggressively responds to inflation in the post-1980 period than in the pre-1980 period.

Shabana, Abdul, and Muammad (2012) Investigated the factors affecting exchange rate variability in Pakistan using *annual data for the period 1975-2010* is used, taken from Economic Survey of Pakistan (various issues) and International Financial Statistics.They used Simple Linear Regression model with ordinary least method (OLS) is used to analyze the results.The study revealed that inflation is the main factor affecting exchange rate in Pakistan. The study further show that the second important variable which bring more variation in exchange rate is economic growth, while order of export and import in variation lies at third and fourth position.

Mariano, Sablan, Sardon, and Paguta, (2016) Investigation of the Factors Affecting Real Exchange Rate in the Philippines, (1973 – 2014).Used the unrestricted vector autoregressive model in order to properly investigate the response of the real exchange rate to the different macroeconomic variables. The Johansen Co integration test shows that there are no evidences of long-run co integration between the dependent variable and the independent variables. Variance decomposition showed that GDP and volume of money flow accounted for most of the real exchange rate movement. All variables except oil prices have a positive relationship to real exchange rate in the Philippines

Ukwuoma, Okonkwo, and Osu(2017) Used Vector Autoregressive (VAR) model to examine Exchange Rate and Economic Growth in Nigeria . They tested the presence or otherwise of causality among the variables using the method of Granger. The result reveals that the optimal lag for the model was 1. The exchange rate was found to Granger cause the economy (LGDP), LOILREV (Oil Revenue) and LGEXP (Government expenditure).

Matemilola, Ariffin and Muhtar (2015) The pass-through of the policy rates to bank lending rate is an important subject matter because it measures the effectiveness of monetary policy to control inflation or stabilize the economy. This study investigates the long-run interest rate pass-through of the money market rate to the bank lending rate and asymmetric adjustment of the bank lending rate. The study applies the momentum threshold autoregressive and asymmetric error correction models. The asymmetric error correction results reveal that bank lending rate adjusts to a decrease in the money market rate in South Africa. The findings suggest that the South African commercial banks adjust their lending rate downward but the lending rate appears rigid upward, which supports the customer reaction hypothesis.

Goodfriend and McCallum (2007) Reconsiders the role of money and banking in monetary policy analysis by including a banking sector and money in an optimizing model otherwise of a standard type. The model is implemented quantitatively, with a calibration based on U.S. data. It is reasonably successful in providing an endogenous explanation for substantial steady-state differentials between the interbank policy rate and (i) the collateralized loan rate, (ii) the uncollateralized loan rate, (iii) the T-bill rate, (iv) the net marginal product of capital,and (v) a pure intertemporal rate. We find a differential of over 3 % pa between (iii) and (iv), thereby contributing to resolution of the equity premium puzzle.

3. METHODOLOGY

The study follows ARDL model. The technique has advantage over other co integration methods because it allow combination of I(0) and I(1) variables. It also takes into account the error correction model. The analysis of error correction and autoregressive lags fully covers both long-run and short-run relationships of the variable under study. The statistical tool of analysis employed in the study includes Augmented Dickey Fuller (ADF) and Philips Peron method of stationary testing. . These methods were employed in order to check the stationarity of the time series data employed in this study. We adopted model used in Hassan, Abubakar and Dantama (2017)

ERVOL = f (NFA, FB, OPEN, OIL, NGDP, IR)

$$ERVOL_t = \beta_0 + \beta_1 NFA_t + \beta_2 FB_t + \beta_3 OPEN_t + \beta_4 OIL_t + \beta_5 GDP_t + \beta_6 IR_t + \varepsilon_t$$

Where; exchange rate volatility (ERVOL), net foreign asset (NFA), fiscal balance (FB), economic openness
(OPEN), oil price (OIL), nominal gross domestic product (NGDP) and interest rate (IR)., ε is the Error Term.

EXCHR=f(MPR,INTR)---------- 1

The equation is transformed to:

LOGEXCHR=B_0 +B_1LOGINTR + B_2LOGMPR+ e---------- 2

Where

LOGMPR=Monetary Policy Rate

LOGEXCHR = Exchange rate

LOGINTR = Interest Rate

e = Error Term

B_1- B_3 are the long run multipliers, B_0 the drift e is error term.

Cointegration relation among the variables is done following the Bound Test Approach.The critical values for the test for cointegration is the upper and lower band.

Test statistics> upper band =cointegration

Test statistics< lower band =no cointegration

Test statistics within upper and lower band = inconclusive.

Wewould obtain the short run dynamic parameters through the error correction model relating to long run estimates.

EXCHR=B_0 +B_1MPR +B_2INTR+ e

The estimates are subjected to diagnostic tests to confirm validity and reliability of estimates.

Data for estimation was obtained from Central Bank of Nigeria Statistical bulletin

4.DATA ANALYSES AND PRESENTATION

Table:1 Descriptive statistics of the Log of data.

	LOGEXCHR	LOGINTR	LOGMPR
Mean	3.354928	2.830980	2.513146
Median	4.525477	2.867331	2.564949
Maximum	5.721262	3.394508	3.258097
Minimum	-0.478036	2.047693	1.791759
Std. Dev.	1.965884	0.289990	0.317447
Skewness	-0.747034	-0.789571	-0.313932
Kurtosis	2.231224	3.718165	3.138781
Jarque-Bera	4.352519	4.639571	0.637439
Probability	0.113465	0.098295	0.727079
Sum	124.1323	104.7463	92.98640
Sum Sq. Dev.	139.1292	3.027398	3.627814
Observations	37	37	37

The summarized descriptive statistics of the explained and explanatory variable as presented in Table 1 above shows that the Log of exchange rate has skewness of -0.747034 and kurtosis of 2.231224,Log of interest rate has skewness of -0789571 and kurtosis of 3.718165 while

Log of monetary police rate has skewness of -0.313932 and kurtosis of 3.138781.

The correlation analysis of the variables is presented in table 1.This is a measure of the degree to which the variables move in same or opposite direction .Correlation has three possible outcomes: Positive, Negative or zero correlation. Positive correlation means two variables are positively related, that is an increase in one leads to the increase in the in the other. When two variables change in opposite direction it is a sign of negative correlation.

Table 2: Correlation Analysis.

Variables	LOGMPR	LOGINTR	
	R^2=0.237345	R^2=.553765	
LOGEXCHR	T=1.445456	T=3.3934461	
	PV=0.1572	PV=0.0004	

The results of breakpoint test is presented in table 2. The result shows that all the variables have problem of structural break during the period under study. The part of the report titled sequential indicate intensity of break while the part titled repartition show chronological order of break. The Unit root test results in Table 3 show that the variables are integrated of different orders which made imperative for use ARDL model. Exchange rate is order one while other variables are stationary at level, the Philip Peron test is the same.

Table 3: Breakpoint Test Result.

Monetary policy rate

Break date	Sequential	Repartition
1	1999	1986
2	1991	1992
3	1986	1999
4	2012	2012

Interest rate

Sequential F-statistic determined breaks:

Break test	Sequential	Repartition
1	1999	1986
2	1991	1991
3	1986	1999
4	2011	2011
	Exchange rate	
Break date	Sequential	Repartition
1	1994	1993

Table 4: Break point unit root

Traditional				Innovative			Additive		
VARIABL	ADF@5 %	W@5%	ORD	ADF@5 %	W@5%	ORD	ADF@5 %	W@5%	ORDs
LEXCHR	-5.121	-2.948	1(1)	-7.475	-5.176	1(1)	7.475	-5.176	1(1)
LINTR	-3.466	-2.945	1(0)	-6.109	-5.176	1(0)	-6.492	-5.176	1(0)
LMPR	-3.002	-2.945	1(0)	-5.803	-5.176	1(0)	-8.806	-5.176	1(1)

A shift in the level of a time series that cannot be explained. There is additive outliers it appears surprisingly at single observation but subsequent observations are unaffected by it. It does not innovate, it appears once and return to status quo. Innovational outlier is the characterised by an initial impact with effect lingering over subsequent observations. It innovates throughout the observation and grows in impact. Endogenisation is where the system is allowed to choose the break dates.

4.1 Diagnostic Tests Results

R^2 =98%,DW 2.3, Ramsey (Reset) F-Stat=0.0045(0.955) BG LM Test-F-Stat 0.777(0.4731)
The short run relationship, it was found that explanatory variables and their lags significant function of EXCHR at 5%.Bound test is an F-test of joint significant of lagged variables. It is a cointegration test in ARDL and test of long run relationship. When the test statistics is greater than than the upper band there is cointegration. When the test statistics is greater than the lower band there in no cointegration but if test statistics is less than the lower band it is inconclusive. Based on the analysis there is cointegration among the variables. In considering the data in Table 5 the null hypothesis is rejected because the test statistics is greater than the lower and upper band. The result show evidence of long run equilibrium relationship among the variables at 5% level.
In view of cointegration relation, the result of table 8 indicate evidence of return to long-run equilibrium in the model. The error correction is negative statistically significant. The negative value shows that there exists an adjustment speed from short run disequilibrium towards the long run equilibrium. The error correction term coefficient is equal to(-0.13),the implication is that a deviation from the equilibrium level in the current year will be corrected by 13% in the following year. In this it take about one year to restore to long-run equilibrium state.

Table: 5 Unit root tests results with structural breaks

Augmented Dick Fuller test unit root.				Philip Peron structural breaks consistent unit root s			
VARIABLE	ADF@5%	CV@5%	REMARK	VARIABL	PPTst@5%	CV@5%	REMARK
LMPR	-3.001645	-2.945842	1(0)	LMPR	-2.991695	-2.945842	1(0)
LEXCHR	-5.121501	-2.948404	1(!)	LEXCHR	-5.121501	-2.948404	1(1)
LINTR	-3.465948	-2.945842	1(())	LINTR	-3.443996	-2.945842	1(0)

Source: Authors compilation of the stationarity properties of the variables.

Table:6 ARDL short term estimates

Dynamic regressors (4 lags, automatic) EXCHR

Fixed regressors: C

Number of models evalulated: 100

Selected Model: ARDL(4, 2, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGEXCHR(-1)	0.760481	0.151765	5.010925	0.0000
LOGEXCHR(-2)	0.020225	0.203266	0.099501	0.9216
LOGEXCHR(-3)	-0.393105	0.204761	-1.919822	0.0668
LOGEXCHR(-4)	0.539872	0.166495	3.242578	0.0035
LOGINTR	1.001209	0.268862	3.723879	0.0011
LOGINTR(-1)	-0.454217	0.242851	-1.870349	0.0737
LOGINTR(-2)	-0.548545	0.220084	-2.492433	0.0200
LOGMPR	0.436244	0.190821	2.286143	0.0314
C	-0.547918	0.669884	-0.817929	0.4214

R-squared	0.985374	Mean dependent var	3.806016
Adjusted R-squared	0.980499	S.D. dependent var	1.551119
S.E. of regression	0.216609	Akaike info criterion	0.005554
Sum squared resid	1.126066	Schwarz criterion	0.413693
Log likelihood	8.908354	Hannan-Quinn criter.	0.142880
F-statistic	202.1150	Durbin-Watson stat	2.299841
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Authors' Computation

Decision Rule/Criteria.

Accept H_o if the t-statistics < 2.5,probability >0.05; otherwise, reject H_o.

From the model above table 4 R^2 of .985374 shows that 98% variation in exchange rate is explained by changes in interest rate.The adjusted R^2 of 0.980499 which includes more number of regressors explain that 98% variation in the dependent variable EXCHR are caused

by changes in interest rate.The p.value of 0.0011 is significant at 0.05 or 5%.This implies that the Interest rate has no positive and significant effect on exchange rate in Nigeria.

Step two: entire model is significant. The Durbin Watson is approximately 2.5 which shows there is no autocorrelation in the model.

Table 4 shows that the coefficient of 1.001209 is positive,the t-statistics of 3.723879> 2.5 and probability value of 0.0011< 0.05 and significant at 5% critical value. Thus , the null hypothesis is rejected and conclude that interest rate has positive and significant effect on exchange rate in line with theory.

A unit increase in interest rate will effect exchange rate by over 100% indicating that interest rate has strong influence on exchange rate. Monetary policy rate has no positive and significant effect on exchange rate in Nigeria.

Table 4 shows that monetary policy has coefficient of 0.436244 is positive, the t-statistics of 2.286143> 2.3 and probability value of 0.0314< 0.05 and significant at 5% critical value. Thus , the null hypothesis is rejected and conclude that monetary policy rate has positive and significant effect on exchange rate. A unit increase in MPR will effect exchange rate by about 44%, indicating that MPR has strong influence on exchange rate

Table: 7 Cointegration Results

ARDL Bound test

Null hypothesis: No long run relationship exist

Test stat. Value

F-stat 8.425152

Critical value bounds

Significance	1(0) bound	1(1)
10%	2.63	3.35
5%	2.63	3.87
2.5%	3.55	4.38
1%	4.13	5

Source:Authors compilation cointegration result of bound test.

Table: 8 Error correction representation

Indices	ECT(-1)	D(LOGINTR)	D(LOGMPR)
Coefficient	-0.072527	5.591139	-0.539872
Std. error	0.011779	0.254127	0.140906
T.stat.	. - 6.157368	2.916673	-3.831422
P-value	0.0000<0.05	0.000<0.05	0.0008<0.05

Source Authors compilation

5. CONCLUSION

The aim of this research is to confirm the implication of monetary police rate on exchange rate in Nigeria. Based on short run relation the explanatory variables show positive and significant effect on exchange rate at 5%. The result of bound test based on ARDL, indicate cointegration among variables given that observed test statistic is above the upper band. The result indicate the presence of cointegrating vectors of long run equilibrium relationship among the variables. There is presence of certain return to long run equilibrium in the model. The error correction term is negative and statistically significant. The error correction term coefficient is equal to (-0.07) which shows that deviation from equilibrium level in the current year will be corrected by 7% in the following year. This shows that it will take about one year to restore the long run equilibrium state of exchange rate in case of any shock from the explanatory variables. Having carried out extensive study of the implication of monetary policy rate on exchange rate in Nigeria. In view of the above stated problems, the study observed that monetary policy rate has positive and significant effect on exchange rate in Nigeria. It was also observed that monetary policy rate has positive and significant effect on interest rate in Nigeria. Monetary policy has been a major policy used in maintaining a stable exchange rate in both developing and developed economies. The potency of this policy to achieve this objective particularly in developing economies has been an issue of controversy. Overall, our results indicated that the impact of monetary policy on exchange rate was significant. There was a positive and significant relationship between monetary policy variables and exchange rate. The conclusion that is drawn from our results is that monetary policy remains an effective and potent tool to ensuring a stable exchange rate in Nigeria.

Based on the findings, the following recommendations are put forward first; monetary policy should be used to create a favourable investment environment by facilitating the emergence of market based interest rate and exchange rate regimes which could attract domestic and foreign investments.

Large dependence on imported goods and services drain the foreign exchange stock or currencies of the country, therefore government should encourage local industries to scale up standards and capacities to produce those goods and services imported into the country. Nigeria is petroleum exporting country yet she import finished petroleum products, the nation’s refineries should be revitalised to perform at optimum capacity and individuals

allowed to establish refineries.

Second; the Central bank of Nigeria (CBN) need to avoid policy inconsistency or summersault to actually determine its policy impact before contemplating a change.

Third, the Government should make the financial sector less volatile to allow smooth execution of CBN monetary policies. Finally, there should be a coordination and balance between monetary and fiscal policies to ensure smooth realization of monetary policy goals.

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