An Empirical Study of the Effect of Monetary Policy Variables on Net Export of Nigeria

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Abstract: *The study is an investigation of the effect of monetary policy variables on net export of Nigeria for the period 1981-2016. Monetary policy variables are the major tools employed by monetary authorities to control money supply and regulate price levels in addition to promoting investments and economic growth of a nation. In this regards, Auto Regressive Distributed Lag (ARDL) bounds cointegration test and its associated ARDL short run and long run coefficients test and Pairwise Granger causality test were utilized in the analysis. The variables engaged in the study include net export (NEX), money supply (LMS), interest rate (INR), exchange rate (LEXCR), foreign direct investment (LFDI), total export (TEXP) and total import (LTIMP). Data for the investigation were obtained from the statistical bulletin of the Central Bank of Nigeria (CBN), volume 26, 2016. The ARDL results demonstrated that both long run and short run relationships exist among the variables. The results also indicated that money supply (LMS) has positive insignificant effect on net export of Nigeria while total export (LTEXP) has positive significant effect on net export of Nigeria. Similarly, the results showed that interest rate (INR), exchange rate (LEXCR), foreign direct investment (LFDI) and total import (TIMP) have negative insignificant effect on net export of Nigeria. More so, the results of the Pairwise Granger causality test indicated that money supply (LMS) has unidirectional relationship with net export (NEX) with significant causality runs from money supply (LMS) to net export (NEX). The results however, indicated no significant causality between NEX and INR, LEXCR, LFDI, TEXP and TIMP. The implication of this result is that, any economic policy that targets increase in money supply and promotion of the total export of goods and services will lead to increase in net export of Nigeria while any attempt by the government to raise interest rate, exchange rate, foreign direct investment and import of goods and services will bring down the growth rate of net export of Nigeria. Based on these results, the study recommends that government should rely much on the increase of money stock in the economy in promoting net export of Nigeria. Government should also design export-led investment growth policies that have the ability to facilitate greater export of goods and services in order to achieve improved net export of the country. It is in doing so, that net export of Nigeria will improve, which will in turn, leads to greater economic growth and improve well-being of the people in Nigeria.*

Keywords: *Monetary policy, Net export, Autoregressive distributed lag model, Pairwise Granger causality*

I.   Introduction

For decades of years now, the geometric acceleration of a long term sustainable economic growth and development especially, through increase in export as one of the major macroeconomic objectives has been the desired aim of every economy in the world. The realization of this goal, undoubtedly, is not automatic. However, it requires policy guidance which involves manipulation of policy instruments (Atuma and Eze, 2017). Such macroeconomic policies that could be used to actualize the above aim encompass mutually monetary and fiscal policies. These policies are inextricable, apart from instruments and implementing authorities. However, monetary policy appears more effective in correcting short term macroeconomic maladjustments due to its frequency in applying and altering policy tools, relative ease of its decision process and sheer nature of the sector which propagates its effect to the real economy. Hence, economists see monetary policy as an essential instrument that every nation can install for the accurate maintenance of domestic price and exchange rate stability, as a significant condition for the attainment of a sustainable economic growth and development (Ulbogu, 1985; Starr, 2005; Balogun, 2007).

Conceptually, monetary policy is one of the macro-economic policies which every nation whether developed or not, adopts in managing their economies. It implies actions or measures initiated by the monetary authorities so as to sway the national economic objectives by controlling the volume and direction of money supply, cost and availability of credits (Asogu, 1998). It covers variety of measures, intended to power or regulate the volume price as well as direction of money in the economy. Particularly, it pervades all the deliberate effort by the monetary authorities to direct supply of money and credits conditions for the intention of

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achieving warrant macroeconomic objectives (Chukwu, 2009). On the other hand, net export refers to the value of a country's total exports minus the value of its total   imports. It is used to calculate a country's aggregate expenditures, or GDP, in an open economy. In other words, net export equals the amount by which foreign spending on a home country's goods and services exceeds the home country's spending on foreign goods and services. Another term for net export is balance of trade; hence, positive net export means a trade surplus, while negative net export means a trade deficit.

In Nigeria, the primary goal of this monetary policy is to maintain domestic price and exchange rate stability, since it is critical for the attainment of sustainable growth and external sector viability (CBN, 1996). This is mainly achieved by causing savers to avail investors of surplus funds for investment through appropriate interest rate structures; stemming wide fluctuations in the exchange rate, and as well proper supervision of banks and other related institutions, so as to ensure financial sector soundness, maintenance of efficient payments system, applying deliberate policies to expand the scope of the financial system so that interior economies which are largely informal, are financially included. Economists have long been interested in factors which cause different countries to grow at different rates and achieve different levels of wealth. One of such factors is foreign trade in relation to positive net export. Nigeria is basically an open economy with international dealings comprising a considerable proportion of her collective output. Hence, Nigeria's economic development depends on the prospects of her export trade with other countries. This is because; foreign trade provides both foreign exchange earnings and market incentives for the geometric acceleration of economic expansion (Chimobi & Uche, 2010).

However, the economy of Nigeria is faced with high rate of unemployment due to low productive investment, inadequate technological advancement and high inflationary pressure. These factors are highly conjectured as being able to militate against the growth of the economy by limiting the ability to transform raw materials into finished product. Thus, adopting monetary policy instruments in manipulating the fluctuations experienced in the economy, the Central Bank of Nigeria (CBN) since its establishment in 1959 has continued to play its traditional role by undertaking both contractionary and expansionary measures in tackling the problems that are observed above. Therefore, the need to investigate the significant effect of monetary policy instruments on the net export is felt.

II. Review Of Related Literature

2.1   *Theoretical Review*

Monetary policy has undergone a vast and complex evolution since the study of the economic phenomenon came into lime light. It has drawn the attention of many researchers with different views on the role and dimensions of money in attaining macroeconomic objectives (Udude, 2014; Atuma & Eze, 2017). Consequently, there are quite a number of hypotheses aimed at creating connection between the stock of money and other economic aggregates such as inflation and output. These schools of thought with different views on the role of money in attaining policy objectives are:

Classical monetary theory

This theory evolved through the concerted efforts and contribution of economists like jean Baptists say, Adam Smith, David Richardo, Pigou and others who shared the same beliefs. The classical model attempts to explain the determinants of such economic variables such as consumption, savings and investment with respect to money. The classical model is based on say's law of markets which states that "supply creates its own demands". Thus, classical economists believe that the economy automatically tends towards full employment level by laying emphasis on price level and on how best to eliminate inflation (Amacher & Ulbrich, 1986; Udude, 2014). The classical economists decided upon the quantity theory of money as the determinant of the general price level by showing how money affects the economy.

Keynesian monetary theory

The Keynesian model assumes as close economy and a perfect competitive market with fairly price-interest aggregate supply function. The economy is also assumed not to exist at full employment equilibrium and also, it works only in the short run; because as Keynes aptly puts it, "in the long run, we also will be dead". In this analysis too, money supply is said to be exogenously determined if wealth holder only have one choice between holding bounds. In fact, Keynesian theory is rooted on one notion of price rigidity and possibility of an economy setting at a less than full employment level of output, income and employment. The Keynesian macro-economy brought into focus the issue of output rather than prices as being responsible for changing economic conditions. In fact, based on Keynesian transmission mechanism, monetary policy works by influencing interest rate which influences investment decisions and consequently, output and income via the multipliers process (Amacher & Ulbrich, 1986; Udude, 2014).

Monetarist Theory

The monetarists are essentially, quantity theorist who adopted Fisher's equation of exchange to illustrate their theory of demand for money and not a theory of output prices and money income (Essia, 1997). Monetarists like Friedman (1963) emphasized money supply as the key factor affecting the wellbeing of the economy. Thus, in order to promote steady of growth rate, the money supply should grow at a fixed rate, instead of being regulated and altered by the monetary authority. Unlike Keynes who maintained that monetary policy alone is ineffective in stimulating economic activities because it works through indirect interest rate mechanism, Friedman on the other hand, argued that since money supply is substitutive not just for bonds only, but also for many goods and services, changes in money supply will therefore have both direct and indirect effects on spending and investment respectively (Amacher & Ulbrich, 1986; Udude, 2014).

2.1.1 Instruments of Monetary Policy

The techniques through which monetary policy pursues it objectives are classified into following approaches:

i.   Market control approach
ii. Portfolio control approach

Market control approach

This is an indirect or traditional approach of monetary control. It includes the manipulation of both the Open Market Operations (OMO) and the Central Bank's discount rate. The Open Market Operations (OMO) refers to the buying and selling of government and other approved securities by the Central Bank in the open market. The Central Bank goes to the public or open market for either long or short term government securities and buys or sells them depending whether the aim is to create or contract bank deposits. Hence, if the Central Bank wants to reduce the volume of money in circulation as the economy irks by inflation, it sells securities to the public for which the public pays by writing cheque favouring the Central Bank and drawn on the commercial banks with which they have their deposit accounts. This in turn, reduces the commercial banks' cash balances with the Central Bank and hence, their ability to create money. Conversely, in times of depression, the Central Bank buys securities thereby increasing the reserve base of the commercial banks and hence, their loanable funds and ability to lend more money to the public.

The Central Bank's discount rate

Central Bank's discount rate measures the price charged by the Central Bank for financial assistance made available to the banking sector in the events of perceived shortages of liquidity (Chowdhry, 1986). In other words, it is the rate of interest the Central Bank charges the commercial banks on funds lent to them against collateral. The term also applies to the central bank's activity of discounting bills when commercial banks run short of funds, they can acquire such from the central bank by discounting bills such as treasury bills, treasury certificate, commercial bills and promissory notes of short term duration at the Central Bank. The lending rates of the commercial banks are closely linked; hence, discount rate induces a fall in commercial banks lending rate and vice versa. The manipulation of the discount rate helps to control the volume of money in circulation. For instance, if the economy experiences inflationary pressure, the Central Bank raises the discount rate thereby making it very costly for the commercial banks to obtain funds from the Central Bank. Consequently, commercial banks in turn, increase their lending rate. The effect of increase in commercial banks' lending rate is to reduce the demand for borrowing, as long as the demand is interest elastic. This will, in effect, cause investment to shrink as well as employment level in addition to income generation and the general price level will all fall.

Portfolio control approach

Portfolio control Approach is a direct or non-traditional approach of monetary control. It works through the instrument of portfolio constraints including reserve requirements, special deposits with the central bank, selective credit controls and moral suasion. In the reserve Requirements, the commercial banks are required to keep some reserves with the Central Bank. By increasing or decreasing the banks' reserve requirement, the central bank affects the banks' ability to lend money to the public. When banks are required to hold more liquid assets in reserve, fewer asserts will be left for them to lend to the general public. On the other hand, a reduction in reserve requirements releases assets held for this purpose for lending as loans and advances by the banks.

Special Deposits with the Central Bank on the other hand, are additional deposits over and above the minimum legal reserve requirements that the commercial banks are made to deposit with the Central Bank. The mandatory special deposits are a major measure in reducing the deposit available for banks to lend to their customers. Though they appear on the asset side of the bank's balance sheets, they cannot be used as part of any reserve base. Similarly, selective credit control is a measure used by the central bank to control the flow of bank credits to different sectors of the economy. The central bank may instruct the bank sector to give more loans to

the preferred sector of the economy-the productive sector while extending little or no credit to the less preferred sectors such as the service or consumption sector of the economy. By the use of selective credit control, monetary policy influences the volume of money in circulation as well as the allocation of resources.

Furthermore, moral Suasion involves the issuing of persuasive instructions to commercial banks to control the flow of their credits to the economy. The Central Bank issues these instructions in its periodic meetings especially, at the bankers' committee meetings, annual dinner of the Chartered Institute of Bankers of Nigeria and on other occasions when it meets formally or informally with the heads of the banking community. Moral suasion is supposed to be an appeal soliciting for the banks' voluntary compliance over some credit guidelines. Meanwhile, direct measurers involve the use of interest rate ceilings, lending ceilings and qualitative lending guidelines. The central Bank may decide to place a limit on the rate of interest and in such a situation the rate of interest cannot fluctuate beyond that limit. The lending ceilings when placed, will limit the amount of fund per period of time that could be lent the public by the commercial bank.

2.1.2 Objectives of Monetary Policy

By monetary policy objectives, we mean the ultimate objectives of macroeconomic policy. These include the maintenance of price stability, balance of payment equilibrium, attainment of high employment, sustainability of economic growth and development, exchange rate stability and the achievement of price stability in an economy. In the modern economy, the price level tends to be sticky if not rigid in the downward direction, so that the problem of price level stability has essentially been that of avoiding inflation. It is simply because, inflation erodes the purchasing power of economic agents and introduces uncertainly as well as other vices in the economy. Price stability is therefore, necessary not only to remove these vices but also to restore confidence and maintain international competitiveness.

Maintenance of Balance of Payments equilibrium

In the macroeconomic objective of the maintenance of balance of payments equilibrium, policy-makers focused on those policies that directly influence the components of the balance of payments including both the current and the capital account in such a way that the balance of payments is always in equilibrium. For instance, monetary policy affects the interest rate; hence, high interest rates attract capital inflows which in turn, influence the balance of payments of the country.

Attainment of high Employment

In the real world situations, the level of employment that implies full employment is not obvious. Economists define a situation of full employment as one where all people who wish to work at the going wage rate in the labour market finds job or employed. But it is not possible that all those seeking employment will be employed at one time. Even in the period of boom in a dynamic economy, some people will always be between jobs or seeking new employment due to fractural and structural unemployment. Thus, the monetary policy measures aim at attaining a high rate of employment that should proxy full employment. In other words, it aims at maintaining a low and stable level of unemployment (Anyanwu, 2003).

Sustainable Economic Growth and Development

Monetary policy strives to promote and sustain economic growth and development in any given economy. Development may be measured by the level of income per head, capital per head, savings per head, the percentage of unexploited resources amount of public goods, the extent to which the working class obtained education. However, economic growth concerns itself with the effect of investment on raising potential income which causes changes in the living standard of the people. The extent to which this level of development and growth are attained depends upon the resources available to the country.

Exchange Rate Stability

Exchange rate fluctuation is not healthy for a growing economy like Nigeria. This is because a fluctuation in exchange rate of a country may cause undue appreciation or depreciation in a country's currency which may have a devastating effect on economic activities of the country; hence, affecting net export, trade balance, and economic growth and development in the economy. The Central Bank in its monetary measures, aims at maintaining adequate level of foreign exchange rate consistent with the efficient allocation of domestic currency of the country.

2.2 Empirical Review

Udude (2014) examined the impact of monetary policy instruments on economic growth in Nigeria for the period 1981-2012 using Vector Error Correction Mechanism (VECM). The study discovered that only exchange rate exerted significant impact on economic growth in Nigeria within the period studied. Nwoko,

Ihemeje & Anumadu (2016) utilized OLS in investigating the influence of monetary policy measures in Nigerian economy. The study revealed that average price and labour force have significant influence on gross domestic product while money supply has insignificant influence on the growth of Nigerian economy.

Charles (2012) studied the effect of monetary policy variables on economic growth and balance of payment in Nigeria using Ordinary Least Squares (OLS) method. The study found that money supply has positive impact on the growth of gross domestic product (GDP) and balance of payment while money supply has negative impact on rate of inflation in the economy. Similarly, Chipote & Makhetha (2014) adopted error correction mechanism to examine the impact of monetary policy variables on economic growth in South Africa, and discovered that money supply and exchange rate have insignificant impact on economic growth in South Africa whereas the money supply has significant impact on inflation.

Onyeiwu (2012) examined the impact of monetary policy on the Nigerian economy using (OLS) technique to analyze data for the period 1981-2008. The result showed that monetary policy through money supply exerts a positive impact on gross domestic product (GDP) growth and balance of payment while the results revealed that money supply exerts negative influence on inflation rate in the economy. Amassoma, Nwosa & Olaiya (2011) investigated the effect of monetary policy on macroeconomic variables in Nigeria for the period 1986-2009 by adopting a simplified Ordinary Least Squared technique. The study indicated that that monetary policy had a significant effect on exchange rate while it has insignificant influence price instability in the country.

Ajisafe & Folorunso (2002) examined the relative effectiveness of monetary and fiscal policy on economic growth in Nigeria using cointegration and its associated error correction model (ECM) techniques from 1970 to 1998. The study showed that monetary rather than fiscal policy exerts a greater impact on economic growth in Nigeria and concluded that emphasis on fiscal action by the government has led to greater distortion in the Nigerian economy. More so, Chukuigwe (2008) investigated the impact of monetary and fiscal policies on non-oil exports in Nigeria for the period 1974-2003 through the application of ordinary least squares (OLS) estimation method. The study indicated that both interest rate and exchange rate have negative influence on non-oil exports, while budget deficits had negative effect on non-oil exports of Nigeria.

Balami, Ahmed & Yusuf (2016) studied the influence of monetary policy implementation on exchange rate, inflation and Nigeria's economic growth. The study utilized analysis approach by using both primary and secondary information. The review found that monetary policy involves trade-off due to its implication on the whole economy and each economic agent reacts to each monetary policy depending on the extent of its positive or negative effects on business or activity. It also discovered that concerning the foreign exchange market, monetary policy makers needs to analyse the fundamentals of export and import as well as the country's elasticity to export before taking policy on whether to devaluate or not.

Sylvie & Wilson (2015) investigated the influence of monetary policy on economic growth of Rwanda for the period 1980-2006. The methods of analysis utilized in the investigation include cointegration test, vector error correction model and the technique of ordinary least square (OLS). The following are the variables employed in the modelling of the study; money supply (M2) and exchange rate (EXCR) and GDP. The study found that there is cointegration among the variables employed in the investigation. It was also showed that monetary policy instruments have significant impact on money supply and exchange rate in the economy.

Ogar, Nkamare & Emori (2014) investigated the influence of the instruments of fiscal and monetary policies on the growth of Nigerian economy for the period of 1986-2010. The study was set to find the monetary and fiscal policy instruments determinants that significantly impacted on economic growth of Nigeria. The study used the method of ordinary least squares (OLS) in the data analysis. The results showed that government revenue has significant and positive impact on economic growth. Similarly, it was revealed in the study that money supply has significant positive impact on economic growth. The study also found that exchange rate has positive impact on the performance of the Nigeria's economy. However, the study showed that inflation insignificantly and positively affects economic growth. Similarly, Anthony, Lekan & Bosco (2013) examined the effect of monetary policy on Nigeria's payments balance stability for the period from 1980 to 2010. The research employed the method of OLS in the analysis. The study discovered that interest rate and supply of money have significant and positive impact on payments balance position of Nigeria.

Imoughele & Ismaila (2015) investigated the effect of monetary policy on balance of payment in Nigeria for the period 1986-2013 using error correction model (ECM). The study discovered that exchange rate, credit to private sector and money supply are the key determinants of balance of payments in Nigeria. hence, the study concluded that monetary policies and implementation capacity is crucial to the growth of the Nigerian economy and that monetary policy variables are very special in the determination of the provision of interest rate to private sector that produce for export which will have a spill over effect on balance of payment and economic growth. More so, balance of payment is a monetary tool and monetary policy can be employed by monetary authority to promote and stabilise the performance of the foreign sector in Nigeria. Danmola & Olateju (2013) examined the influence of monetary policy on the components of current account from 1970 to

2010 in Nigeria through the applications of Johasen Cointegration, error correction model (ECM) and ordinary least square (OLS) technique. The results indicate evidence of long run relationship between money supply and the components of current account employed in the study. The study also revealed that money supply has positive influences on all the variables except the exchange rate that it influences negatively. The study as well discovered that money supply has significant effect on imports, exports and industrial output in Nigeria.

Khaysy & Gang (2017) examined the influence of monetary policy on economic development Lao PDR for the period 1989-2016 through the applications of Johansen Cointegration and its associated error correction model (ECM). The study discovered that money supply, inflation rate and interest rate have negative influences on real gross domestic product (RGDP) per capita in the long run while real exchange rate has positive influence on real gross domestic product (RGDP) per capita. More so, the study showed through the error correction model indicated the existence of short run relationship between real exchange rate, money supply and RGDP per capita in the economy. Hossein & Bahram (2015) studied the impact of monetary and fiscal policies on trade balance of Iran for the period 1979-2012 by employing Autoregressive technique and vector error correction method (VECM). The results obtained from the study showed that monetary and fiscal policies impact negatively on the balance of payments in long term. Similarly, the results of vector error correction model revealed that the model convergence and error correction factor decreases by 0.82.

Udude (2015) examined the effect of monetary policy on balance of payment in Nigeria for the period 1980-2010 using Ordinary Least Squares (OLS) method and Johansen co integration test. The variables employed in the study include balance of payments, interest rate, money supply, exchange rate and gross domestic product. The data were obtained from the Central Bank of Nigeria (CBN) publications. The study showed evidence of long run relationship among the variables. Similarly, the results indicated that money supply and exchange rate have positive impact on balance of payments in Nigeria while interest rate and gross domestic product (GDP) had negative influence on the balance of payments of Nigeria. thus, the study concluded that monetary policy has significant impact on balance of payments of Nigeria within the period under review.

2.2.1 Gap in Literature

This empirical investigation is an improvement of other studies carried out on the topic under study. The study reviewed many empirical studies mainly to lay credence to this study. However, of all the studies reviewed across the countries of the world including Nigeria, this study is not aware any other study that investigated the effect of monetary policy on net export, especially in Nigeria. Meanwhile, some of the studies reviewed focused much on monetary policy and economic growth while monetary policy and net export seems to have been totally ignored by other researcher. Thus, it is the above gap and the desire to contribute to knowledge in literature that motivated this study.

III. Methodology

This study is an investigation of the effect of monetary policy on net export of Nigeria for the period 1981-2016. Unit root test, Auto Regressive Distributed Lag (ARDL) model, and Pairwise Granger causality test were utilized in the analysis. The unit test through the application of Augmented Dickey-Fuller (ADF) unit root test is engaged to determine the level of integration among the series used in the study. Similarly, the ARDL model is used to examine the long run and short run coefficients of the variables employed in the study. The Pairwise Granger causality on the other hand, is utilized to examine the level of causality between monetary policy and net export of Nigeria. The variables used in the modelling of the study include net export (NEX), money supply (MS), interest rate (INR), exchange rate (EXCR), foreign direct investment (FDI), total export (TEXP) and total import (TIMP). Data for these variables are gathered from the Central Bank of Nigeria (CBN) statistical bulletin, volume 26, 2016.

3.1 Model Specification

The model specification of this study followed the lead of Sylvie & Wilson (2015) modeling in Rwanda. The authors modeled gross domestic product with respect to money supply and exchange rate. In this study, the study modified the model using net export (NEX) as the dependent variable while money supply, interest rate, exchange rate, foreign direct investment, total export and total import were employed as the explanatory variables. Thus, the model in functional form is expressed as:

NEX = f(MS, INR, EXCR, FDI, TEXP, TIMP)

    1

Where;

NEX is the net export, MS is the money supply, INR is the interest rate, EXCR is the exchange rate, FDI is the foreign direct investment, TEXP is the total export, TIMP is the total import and f is the functional notion.
In linear function, it is specified thus:

$$NEX_t = \varphi_0 + \varphi_1 MS_t + \varphi_2 INR_t + \varphi_3 EXCR_t + \varphi_4 FDI_t + \varphi_5 TEXP_t + \varphi_6 TIMP_t + e_t$$
$$2$$

Where;
NEX is the dependent variable while LMS, INR, LEXCR, LFDI, TEXP and TIMP are the independent variables; e_t is the error term; φ_0 is the constant term whereas φ_{is} are the parameters of the regression equation.
In log function, it is expressed as:
$$NEX_t = \varphi_0 + \varphi_1 LMS_t + \varphi_2 INR_t + \varphi_3 LEXCR_t + \varphi_4 LFDI_t + \varphi_5 LTEXP_t + \varphi_6 LTIMP_t + e_t$$
$$3$$

Where; L is the log function while t is the current year period. The log function is employed because the normality test carried out indicated non-normal distribution of the time series; thus, log function is estimated to achieve normal distribution of the series used in the investigation. In this case, NEX and INR were not logged in the model because the condition for logging variable indicates that neither non-positive nor growth rate variable is logged while logging variables for estimation which the above two variables fell within.

3.2 A Priori Expectation
In theory, the study expect that money supply, exchange rate, foreign direct investment and total export will have positive relationship with net export while interest rate and total import are expected to have negative relationship with net export of Nigeria.

IV. Results And Discussion
This section of the study dealt with the estimation results and discussion of the results as estimated on monetary policy and net export of Nigeria.

4.1 Unit Root Test
The study engaged this to investigate the presence of unit root among the variables used in this study using the Augmented Dickey-Fuller (ADF) unit root test with or without trend and intercept. The results are shown in the table 1 below.

Table 1: ADF Unit Root Test on Monetary Policy variables and Net Export

Trend and Intercept

Variables	Level		First Difference			
	ADF Statistic	5% Critical Value	ADF Statistic	5% Critical Value	Remarks	
NEX	-2.365226	-2.951125	-5.946539	-2.954021	Stationary	I(1)
LMS	-0.763226	-2.951125	-3.297344	-2.951125	Stationary	I(1)
INR	-3.023070	-2.948404	-8.065277	-2.951125	Stationary	I(1)
LEXCR	-2.087826	-2.948404	-5.782584	-2.951125	Stationary	I(1)
LFDI	-1.800652	-2.948404	-8.096406	-2.951125	Stationary	I(1)
LTEXP	-1.301130	-2.948404	-6.068471	-2.951125	Stationary	I(1)
LTIMP	-0.780125	-2.948404	-6.660028	-2.951125	Stationary	I(1)

Source: Researcher's compilation from E-view 9

Table 1 above depicts the results of ADF stationarity test on monetary policy variables and net export. In the estimation equation, the results indicated all the variables including NEX, LMS, LEXCR, LFDI, LTEXP and TIMP except INR were non-stationary at level. However, the results showed that all the variables became stationary after first differencing. Thus, having showed stationarity after first differencing, it means that the variables possessed long run properties which further imply that their mean, variance and covariance are constant overtime. The results as well revealed that the variables are integrated of the same order one.

4.2 Auto Regressive Distributed Lag (ARDL) Bounds Cointegration Tests
ARDL Bounds cointegration test is concentrated on the determination of long run and short run coefficients of the variables under study. This model was developed by Pesaran & Shin (1999) and Pesaran et al. (2001) with the aim of investigating the long run relationship and short run dynamic interactions among the variables of a study. The ARDL required no integration of the same order among the variables for the model to be applied in any investigation. Therefore, It can be applied even when the underlying variables are integrated of order one, order zero or fractionally integrated or even when the sample size of the data is same and finite. The technique of the ARDL model ensures unbiased estimation results of the long run model (Harris & Sollis, 2003). Thus, the ARDL model is expressed as follows:
$$\Delta y_t = \beta_0 + \Sigma \beta_i \Delta y_{t-i} + \Sigma \gamma_j \Delta x_{1t-j} + \Sigma \delta_k \Delta x_{2t-k} + \theta_0 y_{t-1} + \theta_1 x_{1t-1} + \theta_2 x_{2t-1} + e_t$$
$$4$$
Hence, the estimation results of the ARDL model are revealed below.

Table 2: ARDL Bounds Cointegration Test between Monetary Policy variables and Net Export
Dependent Variable: NEX

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NEX(-1)	0.739930	0.178115	4.154220	0.0003
NEX(-2)	-0.711555	0.257739	-2.760754	0.0106
LMS	557.9643	474.5330	1.175818	0.2507
INR	-55.32344	49.24661	-1.123396	0.2719
LEXCR	-952.9634	543.8267	-1.752329	0.0920
LFDI	-108.4116	193.5581	-0.560098	0.5804
LTEXP	2159.762	694.3110	3.110655	0.0046
LTIMP	-1466.496	748.2726	-1.959842	0.0613
C	-2161.185	1624.316	-1.330520	0.1954
R-squared	0.872231	Mean dependent var		1383.229
Adjusted R-squared	0.831345	S.D. dependent var		2069.794
F-statistic	21.33316	Durbin-Watson stat		1.895658
Prob(F-statistic)	0.000000			

Source: Researcher's compilation from E-view 9

Table 2 above depicts the results of ARDL bounds cointegration test between monetary policy variables and net export in Nigeria. The results that money supply (LMS) at lag zero period (current year period) has positive and insignificant effect on net export while total export (LTEXP) at lag zero year period (current year period) has positive significant effect on net export of Nigeria. Similarly, interest rate (INR), exchange rate (LEXCR), foreign direct investment (LFDI) and total import (TIMP) at lag zero year periods (current year period) have negative insignificant effect on net export of Nigeria. This claim is evidenced by the coefficients and the p-values of the estimated variables. From the results, the coefficients of LMS and LEXCR are 557.9643 and 2159.762 with their respective their p-values being 0.2507 and 0.0046 which are each greater than 5% critical value. More so, the coefficient of INR, LEXCR, LFDI and LTIMP are -55.32344, -952.9634, -108.4116 and -1466.496 whereas their respective p-values are 0.2719, 0.0920, 0.5804 and 0.0613 which are greater than the chosen 5% level of significance. The results imply that monetary policy has positive effect on the net export of Nigeria. These results are in line with the monetarists' theory of money demand which postulated that quantity of money in circulation determines the volume of goods and services traded in an economy. Hence, it has positive relationship with the country's international trade position as free market economy leads to strong self-adjustment tendencies.

Empirically, the results are in line with the findings of Charles (2012), Onyeiwu (2012), Amassoma, Nwosa & Olaiya (2011), Ajisafe & Folorunso (2002), Ogar, Nkamare & Emori (2014), Danmola & Olateju (2013) and Anthony, Lekan & Bosco (2013) who investigated the effect of monetary policy on economic growth of various countries and found positive relationship between monetary policy and economic growth. However, the results negate the findings of Chipote & Makhetha (2014), Khaysy & Gang (2017) and Chukuigwe (2008) who carried the same research on monetary policy in relation to its effect on economic growth and found negative relationship between the two variables.

Furthermore, the F-statistic is 21.33316 whereas the Prob(F-statistic) is 0.000000. The result indicates that the joint effect of the independent variables on the dependent variable is statistically significant. The coefficient of multiple determination R^2 is 0.872231, which implies that 87.2% of the variations in net export (NEX) are accounted for by the explanatory variables such as LMS, INR, LEXCR, LFDI, TEXP and TIMP while the remaining 12.8% is attributed to other variables excluded from the model. Similarly, Durbin Watson (DW) statistic is 1.895658. The lower limit (dL) of the DW is 1.271 whereas the upper limit is 1.651. Thus, since the DW statistic of 1.895658 exceeds the upper limit value of 1.651; the study concludes that serial correlation does not exist in the model. In confirmation of this claim, Breusch-Godfrey serial Correlation LM test was conducted. The results indicate Observed R-squared of 4.427127 with Prob.Chi-Square value of 0.1093. Since the Prob.Chi-Square value is greater than 5% level of significance, the study accepts the early assertion that serial correlation is not found in the model.

More so, the study tested for model specification using Ramsey RESET test. From the results, the t-statistic and F-statistic values of 2.044793 and 4.181178 respectively while their associated p-value is 0.0520. Since the p-value is greater than 5% critical value, the study concludes that the model is well specified. In the view, the study tested for normality distribution among the data series by employing Jarque-Bera approach. It is observed in the result that the Jarque-Bera value is 1.581331 while the p-value is 0.453543, which exceeds 5% critical value. Thus, the study asserts that the series used in the study are normally distributed after logging the variables. The study also tested for the presence of homoscedasticity using heteroscedasticity test: ARCH. The

results indicate evidence of homoscedastic is in the model. From the results, the Obs*R-squared value is 2.053647 and its associated prob.Chi-Square value of 0.1518, which is greater than 5% level of significance.

4.2.1 ARDL Short-run and Long-run Coefficients tests for Monetary Policy variables and Net Export

This test is applied to investigate the long-run relationship and short-run dynamics of the variables under study. Hence, the ARDL results are illustrated below.

Table 3: ARDL Short Run and Long Run Coefficients Test between Monetary Policy variables and Net Export

Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NEX(-1))	0.711555	0.257739	2.760754	0.0106
D(LMS)	557.964277	474.533039	1.175818	0.2507
D(INR)	-55.323439	49.246612	-1.123396	0.2719
D(LEXCR)	-952.963381	543.826728	-1.752329	0.0920
D(LFDI)	-108.411574	193.558140	-0.560098	0.5804
D(LTEXP)	2159.762226	694.311008	3.110655	0.0046
D(LTIMP)	-1466.495768	748.272566	-1.959842	0.0613
ECT	-0.971625	0.199234	-4.876800	0.0001
Cointeq = NEX - (574.2590*LMS -56.9391*INR -980.7935*LEXCR -111.5776*LFDI + 2222.8355*LTEXP -1509.3230*LTIMP -2224.2998)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMS	574.258956	449.997451	1.276138	0.2136
INR	-56.939094	49.357217	-1.153612	0.2596
LEXCR	-980.793536	492.087793	-1.993127	0.0573
LFDI	-111.577604	205.414562	-0.543183	0.5918
LTEXP	2222.835499	816.986448	2.720774	0.0117
LTIMP	-1509.323024	834.895502	-1.807799	0.0827
C	-2224.299799	1500.088178	-1.482779	0.1506

Source: Researcher's compilation from E-view 9

The table 3 represents the results of ARDL long-run and short-run coefficients tests between monetary policy variables and net export of Nigeria. The results indicate evidence of the long run relationship among the variables under study. From the results, the p-value of the coefficient of LTEXP is 0.0117 which is less than 5% critical value. Hence, since the results indicate at least one cointegrating equation, the study concludes that long run relationship exist among the variables.

More so, the results revealed evidence of short run relationship among the variables of study. This is shown by the ECT p-value of 0.0001 which is less than the 5% critical value. The ECT result indicates that the relationship between the variables met the a priori expectation and satisfied the stability condition needed to conduct a research of this nature. It also implies that the estimation results possessed its required signs for each of the parameter. The ECT is significant, fractional and negative. From the results, the coefficient of ECT is -0.971625 while the p-value is 0.0001, which indicates that the adjustment speed rising from short-run disequilibrium towards long-run equilibrium relationship in yearly is 26.4%.

4.3 Pairwise Granger Causality test

The Pairwise Granger Causality test is utilized to investigate the causality between monetary policy variables and economic growth in Nigeria. The results of the test are shown in the table 4 below.

Table 4: Pairwise Granger Causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
LMS does not Granger Cause NEX	34	4.04954	0.0281
NEX does not Granger Cause LMS		0.48608	0.6200
INR does not Granger Cause NEX	34	0.49902	0.6122
NEX does not Granger Cause INR		1.84544	0.1760
LEXCR does not Granger Cause NEX	34	1.41300	0.2597
NEX does not Granger Cause LEXCR		1.24674	0.3024
LFDI does not Granger Cause NEX	34	0.97491	0.3892
NEX does not Granger Cause LFDI		1.20010	0.3157
LTEXP does not Granger Cause NEX	34	2.24926	0.1236
NEX does not Granger Cause LTEXP		1.41004	0.2604

LTIMP does not Granger Cause NEX	34	2.34713	0.1136
NEX does not Granger Cause LTIMP		0.15837	0.8543
INR does not Granger Cause LMS	34	1.63592	0.2122
LMS does not Granger Cause INR		1.10135	0.3459
LEXCR does not Granger Cause LMS	34	2.50442	0.0992
LMS does not Granger Cause LEXCR		0.43010	0.6545
LFDI does not Granger Cause LMS	34	0.69195	0.5087
LMS does not Granger Cause LFDI		6.27846	0.0054
LTEXP does not Granger Cause LMS	34	3.45345	0.0452
LMS does not Granger Cause LTEXP		0.24166	0.7869
LTIMP does not Granger Cause LMS	34	1.46031	0.2487
LMS does not Granger Cause LTIMP		0.98909	0.3841
LEXCR does not Granger Cause INR	34	1.63511	0.2124
INR does not Granger Cause LEXCR		7.23444	0.0028
LFDI does not Granger Cause INR	34	0.38963	0.6808
INR does not Granger Cause LFDI		0.53600	0.5908
LTEXP does not Granger Cause INR	34	0.92779	0.4068
INR does not Granger Cause LTEXP		5.49003	0.0095
LTIMP does not Granger Cause INR	34	1.06374	0.3582
INR does not Granger Cause LTIMP		9.67306	0.0006
LFDI does not Granger Cause LEXCR	34	0.48496	0.6206
LEXCR does not Granger Cause LFDI		4.79059	0.0159
LTEXP does not Granger Cause LEXCR	34	0.54110	0.5879
LEXCR does not Granger Cause LTEXP		3.99963	0.0292
LTIMP does not Granger Cause LEXCR	34	0.11039	0.8959
LEXCR does not Granger Cause LTIMP		4.91216	0.0145
LTEXP does not Granger Cause LFDI	34	1.66001	0.2077
LFDI does not Granger Cause LTEXP		0.78584	0.4652
LTIMP does not Granger Cause LFDI	34	2.38161	0.1102
LFDI does not Granger Cause LTIMP		1.51864	0.2359
LTIMP does not Granger Cause LTEXP	34	0.02065	0.9796
LTEXP does not Granger Cause LTIMP		4.03503	0.0284

Source: Researcher's compilation from E-view 9

The table 4 illustrates the results of Pairwise Granger causality test between monetary policy variables and net export in Nigeria. From the results, money supply (LMS) has unidirectional relationship with net export (NEX) with causality runs from money supply (LMS) to net export (NEX). This is shown by the p-value of the causality which runs from LMS to NEX in the estimation results. The p-value of the causality is 0.0281, which exceeds 5% critical value. However, it is also observed in the study that that NEX, LEXCR, LFDI, LTEXP and TIMP do not have significant causality with NEX. These claims are shown by the respective p-values of the causalities of the variables in relation to net export (see table 4). This result indicates that money supply has significant influence on the growth of net export of Nigeria while other variables do not have.

4.4   Policy Implications of the Results
The study investigated the effect of monetary policy variables on net export of Nigeria for the period 1981-2016. The results obtained from the estimation of the ARDL short run and long run coefficients test revealed that both short run and long run relationships exists among the variables of the study. The results of the ARDL bounds cointegration test showed that money supply (LMS) has positive and insignificant effect on net export while total export (LTEXP) has positive significant effect on net export of Nigeria. From the results, the coefficients of LMS and LEXCR are 557.9643 and 2159.762 units respectively. Thus, it is estimated on the average that 1% rise in money stock in the economy of Nigeria will results to 557.9643 increases in the net export of Nigeria and also 1% increase in total export of Nigeria will lead net export of Nigeria to rise by 2159.762. Similarly, the results indicated that interest rate (INR), exchange rate (LEXCR), foreign direct

investment (LFDI) and total import (TIMP) exert negative insignificant effect on net export of Nigeria. From the results, the coefficients of INR, LEXCR, LFDI and TIMP are -55.32344, -952.9634, -108.4116 and -1466.496 respectively. Hence, it is estimated that any government economic policy that increase interest rate, exchange rate, foreign direct investment and total import by 1% will in variably lead net export of Nigeria to decrease by the tune of 55.32344, 952.9634, 108.4116 and 1466.496 units respectively.

Lastly, the results of the Pairwise Granger causality showed unidirectional relationship between money supply (LMS) and net export (NEX) with significant causality runs from LMS to NEX. However, no causality is found between NEX and INR, LEXCR, LFDI, TEXP and TIMP. Thus, the study estimated that any government attempt to raise the money supply will lead to improve in net export growth in Nigeria. However, other variables engaged in the estimation indicate no significant causation with the net export of Nigeria.

V. Conclusion And Recommendations

This study investigated the effect of monetary policy variables on net export of Nigeria from 1981 to 2016. Monetary policy instruments are the major tools used by monetary authorities to control money supply and regulate prices of goods and services in addition to promoting investments and economic growth in an economy of a nation. In this regards, Auto Regressive Distributed Lag (ARDL) bounds cointegration test and its associated ARDL short run and long run coefficients test and Pairwise Granger causality test were employed in the analysis. The study engaged the variables such as net export (NEX), money supply (LMS), interest rate (INR), exchange rate (LEXCR), foreign direct investment (LFDI), total export (TEXP) and total import (LTIMP) in the investigation. Stationarity test was conducted through the application of the Augmented Dickey-Fuller (ADF) unit root test. The results indicate that all the variables except INR were non-stationary at level; however, all the variables were shown to be become stationary after first differencing at 5% level of significance.

The ARDL results revealed that both long run and short run relationships exist among the variables. The results also indicated that money supply (LMS) at lag zero period (current period) has positive insignificant effect on net export of Nigeria while total export (LTEXP) has positive significant effect on net export of Nigeria. Similarly, the results demonstrated that interest rate (INR), exchange rate (LEXCR), foreign direct investment (LFDI) and total import (TIMP) at lag zero year periods (current year period) have negative insignificant effect on net export of Nigeria. More so, the results of the Pairwise Granger causality test showed that money supply (LMS) has unidirectional relationship with net export (NEX) with significant causality runs from money supply (LMS) to net export (NEX). The results however, indicated no significant causality between NEX and INR, LEXCR, LFDI, TEXP and TIMP. The implication of this result is that, any economic policy that targets increase in money supply as well as the promotion of the country's total export of goods and services will in variably lead to increase in the net export of Nigeria while any attempt by the government to raise interest rate, exchange rate, foreign direct investment and import of goods and services will bring down the growth rate of net export of Nigeria. Based on these results, the study recommends that government should rely much on the increase of money stock in the economy in promoting net export of Nigeria. Government should also design export-led investment growth policies that have the ability to facilitate greater export of goods and services in order to achieve improved net export of the country. It is in doing so, that net export of Nigeria will improve, which will in turn, leads to greater economic growth and living standard of the people in the nation.

References

[1]. Amacher, R.C & Ulbrich, H.H. (1986). Principles of macroeconomics: South Westtern Publishing Co. Cincinnati
[2]. Amassoma, D., Nwosa, P.I and Olaiya, S.A. (2011). An appraisal of monetary policy and its effect on macroeconomic stabilization in Nigeria. Journal of Emerging Trends in Economics and Management Sciences, 2(3): 232-237.
[3]. Ajisafe, R.A. and B. Folorunso, (2002). The relative effectiveness of fiscal and monetary policy in macroeconomic management in Nigeria. The African Economic and Business Review, 3(1): 23-40.
[4]. Anyanwu, J. C. (2003). Public finance: CREMD publishers, Owere
[5]. Anthony, I. I., Lekan, M. O. & Bosco, I. E. (2013). Monetary policy and its implications for balance of payments stability in
[6]. Nigeria. International Journal of Economics and Finance, 5(3), 197-204.
[7]. Atuma, E. & Eze, O. M. (2017). Fiscal instruments and economic growth in Nigeria. European Journal of Business and Management, 9(19), 105-120.
[8]. Asogu, J.O. (1998). An econometric analysis of the relative potency of monetary and fiscal policy in Nigeria: CBN Economic and Financial Review 36, 2.
[9]. Balami, D. H., Ahmed, F. F. & Yusuf, A. B. (2016). Impact of monetary policy in Nigeria on inflation, exchange rate and economic growth. IIARD-International Journal of Economics and Business Management, 2(5), 67-82.
[10]. Balogun, E.(2007). Monetary policy and economic performance of West Africa monetary zone countries. MPRA, 3408.
[11]. Central Bank of Nigeria (1996). Monetary policy in Nigeria: Abuja, CBN volume 3.
[12]. Chimobi,O.P. & Uche, U. C. (2010). Money, price and output: A causality test for Nigeria. American Journal of Scientific Research, 8, 78-87.
[13]. Chipote, R. & Makhetha, S. (2014). Impact of monetary policy on economic growth: A case study of South Africa: Mediterranean Journal of Social Sciences, 5(15).

[14]. Chowdhry, A.R. (1986). Monetary and fiscal impacts on economic activities in Bangladesh. Bangladesh Development Studies, xiv, 2.
[15]. Chukwu A. C. (2009). Measuring the effects of monetary policy innovations in Nigeria. Africa Journal of Accounting,
[16]. Economics, Finance and Banking Research, 5(5).
[17]. Chukuigwe, E. C. and Abili I. D. (2008). An econometric analysis of the impact of monetary and fiscal policies on non-oil exports in Nigeria. African Economic and Business Review, 6 (2), 17-24.
[18]. Danmola, R. A. & Olateju, A. O. (2013). The impact of monetary policy on current account balance in Nigeria. IOSR Journal of Humanities and Social Science, 7(3), 67-72.
[19]. Essia, U. (1997). The evolution of economics as an academic discipline. Journal of Economic Studies, 1(1).
[20]. Friedman, S. K. (1963). Money and business cycles. Review of Economics and Statistics, 45.
[21]. Harris, R. & Sollis, R. (2003). Applied time series modeling and forecasting. West Sussex: Wiley.
[22]. Hossein, O. & Bahram, T. (2015). The impact of monetary and fiscal policies on balance of payments in order to fulfill the objectives of the Fifth development plan in Iran. Journal of Scientific Research and Development, 2(6), 71-74.
[23]. Imoughele, L. E. & Ismaila, M. (2015). Monetary policy and balance of payments stability in Nigeria. International Journal of Academic Research in Public Policy and Governance, 2(1), 1-15.
[24]. Khaysy, S. & Gang, S. (2017). The impact of monetary policy on economic development: Evidence from Lao PDR. Global
[25]. Journal of Human-Social Science: E Economics, 17(2), 9-15.
[26]. Nwoko, N. M., Ihemeje, J. C. & Anumadu, E. (2016). The impact of monetary policy on the economic growth of Nigeria:
[27]. An International Multi-disciplinary Journal, Ethiopia, 10(3), ISSN: 1994-9057.
[28]. Ogar, A. Nkamare, S. E & Emori, E. G. (2014). Fiscal and monetary policy and its effect on the growth of Nigerian economy. European Journal of Business and Management, 6(29), 220-232.
[29]. Onyeiwu, C. C. (2012). Monetary policy and economic growth of Nigeria. Journal of Economics and Sustainable Development, 3(7), 62 -70.
[30]. Pesaran, M. H. & Y. Shin (1999). An autoregressive distributed lag modeling approach to cointegration analysis. Chapter 11 in S. Strom (ed.), Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge University Press, Cambridge. (Discussion Paper version).
[31]. Pesaran, H. M., Shin, Y. & Smith, R. J. (2001). Bound testing approaches to the analysis of long-run relationships. Working Paper, University of Cambridge, 65-77.
[32]. Starr, M. (2005). Does money matter in the CIS? Effect of monetary policy on output and prices. Journal of competitive Economics, 44-46.
[33]. Udude, C. C. (2014). Monetary Policy and Economic Growth of Nigeria. Journal of Policy and Development Studies, 9(1), 234-247.
[34]. Udude, C. C. (2015). Monetary policy and balance of payment in Nigeria. Journal of Policy and Development Studies, 9(2), 14-26.