Fiscal Policy Determinants of Money Demand in Nigeria: ARDL Bound Testing Approach

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Abstract

The study examines the fiscal policy determinants of money demand in Nigeria using annual time series data from 1981 to 2017. The study intends to determine the effects of fiscal policy variables on money demand in Nigeria. A modified Fisher money demand model was estimated using ARDL to capture the long-run equilibrium relationship between the variables. The results showed that the fiscal policy variables had a stable long-run equilibrium relationship with money demand in Nigeria. Among the fiscal policy variables examined, government spending was found to be most impactful on the demand for money in the reverse direction. Furthermore, while government revenue and budget deficit have positive and significant effect on money demand, the effect of income was on significant. Also, government revenue and government expenditure granger caused demand for money. Overall, fiscal policy variables constitute strong influence on variations in money demand in Nigeria. The monetary authority in the country should take into account the influence of fiscal policy variables in planning the target level of money demand and monetary policy in Nigeria.

Key words: Money Demand, Government Expenditure, Government Revenue, Budget Deficit, Auto-regressive Distributed Lag Model (ARDL)
J.E.L. classification: C32, E41, E62

1. Introduction

In most economies around the world, governments adopt fiscal policy in addition to monetary policy in the effort to achieve fundamental macroeconomic objectives of economic growth, price stability, unemployment reduction, income redistribution and economic stabilization. Each fiscal operation could have implications for the stock of money in the economy. The behavior of money stock held by individuals continues to be the subject of contentious theoretical and empirical research in the literature. A clear analysis of the volume of money that is held by individuals could guarantee some predictability of critical macroeconomic variables like interest rates, output, and inflation (Eggertsson & Krugman, 2012). Economic theory suggests that the demand for money is a function of critical macroeconomic variables, such as the level of the interest rate, income, price level and wealth (Osamwonyi & Evbayiro-Osagie, 2012).

Nigeria has had more than two decades of fiscal deficits in the course of the government effort to develop the economy (Adedotun, 1997). Within the period, the country has witnessed remarkable inflow of government revenue from oil earnings, and the financial system has seen several reforms to improve the performance. The massive volume of government spending has spilt on the spending habits of the people and would consequently have implication for the volume of money in circulation. Theoretically, the stability of the money demand function is crucial for the implementation of any credible monetary policy as has been underscored by the studies of Friedman and Schwartz (1982) and Melnick (1995), amongst others.

This study aims to determine whether a long run equilibrium relationship exist between money demand and fiscal policy variables. In addition, the study would also examine the specific effects that government revenue and government expenditure have on money demand in Nigeria. Finally, the study would assess the implications of long term fiscal deficit action of government on money

demand in Nigeria. This stems from the fact that a clearer assessment of the impact of government fiscal actions on the money demand function is necessary for establishing a direct link between relevant monetary aggregate and nominal income. In other words, the stability of fiscal policy and the money demand function could enhance the ability of the Central Bank to improve on its achievement of predetermined monetary growth targets (Doguwa et al, 2014). This is particularly important to a developing country like Nigeria that exist under the regular threat of real exogenous shocks to the financial system as was observed during the global financial crises of 2008/09.

While existing literature is of abundance on the general determinants of money demand (Lone & Yaday, 2016; Dou, 2018), some other authors have examined the relative effectiveness of fiscal and monetary policies on the Nigerian economy. The existence of literature on the effect of fiscal policy determinants of money demand in Nigeria is very scanty. This study is designed to fill this gap.

The review of empirical findings on demand for money and other macroeconomic variables show that money demand has long run equilibrium relationship with most of the macroeconomic variables (Nwafor et al, 2007; Mohsen & Gelan, 2009; Herve & Shen, 2011; Doguwa et al, 2014). A number of authors have argued that income plays an important role in determining the variations in money demand (Teriba, 1974; Irfan, 2003; Nwafor et al, 2007; Mohsen & Gelan, 2009; Herve & Shen, 2011; Doguwa et al, 2014; Dou, 2018; Ebadi, E. 2018). In several other studies, some other authors have argued that fiscal policy variables constitute strong factors that may determine the demand for money function (Mankiw & Summers, 1986; Adbullah & Irfan, 2013). In line with theory, most of the studies agree that interest rate and inflation are the very strong determinants of money demand (Teriba, 1974; Nwafor et al. 2007; Dou, 2018).

The empirical studies reviewed did not account for the effect of fiscal policy variables on money demand in a developing economy like Nigeria.

2. Theoretical framework

The theory of money demand highlights the key factors that motivate human beings to hold part of their wealth in cash as opposed to other assets. Jhingan (2007) gives three approaches to the study demand for money: the first approach he refers to as the classical approach which can be divided into (a) Fisher's equation of exchange; b) the Cambridge approach (cash balance). The second approach is related to the Keynesian liquidity preference postulations while the third is the post Keynesian approach which could be classified as Tobin's Baumols's and Friedman's approaches.

Generally, the subject of why people hold money has been greatly debated over the ages by many authors. The main debate on money demand by authors started with Irving Fisher in the early 1900s. John Maynard Keynes made his contributions to the subject matter in the 1920s and 1930s and then William Baumol also made his input. Other writers on the subject matter include James Tobin amd Milton Friedman (Odior & Alenoghena, 2016). Keynes (1936) had a great impact on theory of demand for money function. He introduced a conceptual framework that fostered the development of all modern theories. The discussion of fiscal policy and money demand is more situated in Friedman's analysis of the relationship between money demand wealth and income (Friedman, 1956). Carpenter & Lange (2002) opined that a stable money demand function has long been sought after because it can be very useful for explaining, and even predicting the behavior of other aspects of the macro-economy. They further contended that, in orthodox setting, demand for money is a function of the opportunity cost of holding cash and macroeconomic variable like nominal GDP (Bitrus, 2011A). When the relationship between money demand and GDP is stable and the elasticity of demand for money and the opportunity cost is given, then money data may be observed with relatively high frequency and adopted to predict nominal output that may be observed at smaller frequency. Accordingly, while both conditions may be relevant, the second is much more easily adopted.

The emphasis of our paper is focused on the framework of the classical theory of money demand and hence, the situate emphasis of our discussion. The classical economic theorists did not originally set out explicitly to formulate demand for money theory. They started off in a framework of numerical measurements in monetary economics in the early 1900s (Humphrey, 2001). Irving

Fisher developed an equation of exchange which emphasized the transaction aspect of the demand for money in respect of the velocity of circulation of money (Jhingan, 2007). The classical economists reasoned that since money acts as the medium of exchange therefore, it facilitates the exchange of goods and services. This opinion was expressed in the Fishers Equation of Exchange which is shown as follows:

$MV = PQ$ (1)

where, M is the quantity of money; V shows its velocity of circulation; P is price level and Q is total output. In the equation, MV refers to Money supply, while PQ represents the total output of goods and services which is equivalent to Money Demand (Humphrey, 2001). At equilibrium, the supply of money (MV) equals money demand (PQ). The main focus of this proposition is on the amount of money that people hold to buy goods and services at a particular point in time. This, however, does not explain the reason why people hold money in cash. In addition, some have argued that P and M, are extremely difficult to estimate or calculate.

A slight amendment was introduced to the Fisher's Equation of Exchange by the Cambridge Economists was spearheaded by A.C. Pigou. The Cambridge economists raised a vital question to improve the development of the theory. They asked: Why would individuals want to hold their assets in the form of cash? Consequently, The Cambridge demand equation for money is presented as:

$M_d = kPY$ (2)

Where, M_d refers demand for money; k is the fraction of real money, incomes individuals want to hold in the form of cash; while P denotes the price level and; Y refers the aggregate real income. The letter k denotes the portion of the total value of all monetary transactions in the economy that the general public wishes to hold in cash balances. This tells us the necessary amount of Money (M) that is required to undertake level of PT (total spending). Note that P multiplied by T is equivalent to the total monetary value of all transactions in the economy. This means that the Cambridge Equation also suffers from the same deficiency with the Fisher's Identity Equation. Thus estimating the value of T is still a problem.

3. Methodology and model specification

3.1. The model

We refer to equation (1) which summarizes the Fisher's Equation of Exchange

$MV = PQ$ (3)

The general for of the equation can be written as constant and we derive the demand for money function as follows:

$(M/P)d = Ky$ (4)

It is assumed that demand and supply of money is equal at equilibrium, hence we can equate the real money balances to each other as follows:

$(M/P)d = (M/P)$ (5)

This gives us the basis (in conformity with literature) to use money supply in estimation of demand for money as follows:

$M/P = kY$ (6)

While M/P refers to Broad Money Supply deflated by prices, kY refers to the impact of Government fiscal variables. Therefore,

Our equation may now be specified in line with the study of Faridi et al. (2014) where he recognized government revenue, government expenditure, economic growth and budget deficit as the key determinants of demand for money in an economy. Therefore, we may specify the demand for money model as follows:

$Md = f(GREV, GEXP, GDPR, BDEF)$ (7)

Where:

Md = M2/P (Broad Money deflated by prices); GREV = Government Revenue; GEXP = Government Expenditure; GDPR = GDP Growth Rate; BDEF = Budget Deficit (estimated as percentage of BDEF on GDP)

For the purpose of estimation we can put the equation (13) in Linear-Log form to normalize the scales of the variables as follows:

$$LMd_t = \beta_0 + \beta_1 LGREV_t + \beta_2 LGEXP_t + \beta_3 GDPR_t + \beta_4 BDEF_t + \mu_t \text{ -} \quad (8)$$

Apriori Expectations: $\beta_0 > 0;\ \beta_1 > 0;\ \beta_2 < 0;\ \beta_3 > 0;\ \beta_4 < 0$

3.2. Methodology

The ARDL Bounds Test and ARDL Causality. The ARDL bounds test procedure was developed by Pesaran & Smith (2001) and can be applied whether the regressors are stationary at level [I(0)], first difference [I(1)] or mixed cointegrated [I(0) and I(1)]. The technique is specifically derived from ECM models that are called VECMs. The application of the ARDL model has proved to be capable of generating reliable estimates in the context of endogenous variables (Gujarati, 2009). Consequently, this study adopts the lag length using Schwartz information criterion (SC) for the tests of unit roots of all variables by using Phillips-Perron test and in the conduct cointegration tests by applying the LR test technique propounded by Johansen (1995). Since the ARDL model can handle variables that are integrated at order I(0) and or I(1), the unit root test may be conducted to ascertain that the order of integration for the variables does not exceed I(1).

The model for the relationship between fiscal variables and demand for money this article is shown in equation (13) as:

Md = f(GREV, GEXP, GDPR, BDEF)

The error correction models specification to be estimated under the ARDL Bound testing procedure is shown as follows:

$$\begin{aligned}\Delta LMd_t = {} & \alpha_0 + \beta_{1i} LMd_{t-1} + \beta_{2i} LGREV_{t-1} + \beta_{3i} LGEXP_{t-1} + \beta_{4i} LGDPR_{t-1} + \beta_{5i} LBDEF_{t-1} \\ & + \sum_{i=0}^{P} \lambda_{1i}\, \Delta LMd_{t-1} + \sum_{i=0}^{P} \lambda_{2i}\, \Delta LGREV_{t-1} + \sum_{i=0}^{P} \lambda_{3i}\, \Delta LGEXP_{t-1} \\ & + \sum_{i=0}^{P} \lambda_{4i}\, \Delta LGDPR_{t-1} + \sum_{i=0}^{P} \lambda_{5i}\, \Delta LBDEF_{t-1} + \mathcal{E}_{1t} \qquad (9)\end{aligned}$$

Where Δ is the difference operator and α_0 represent the drift component. The coefficients $(\beta_{1i} - \beta_{5i})$ expresses the long run relationship while the part with the summation sign $(\lambda_{1i} - \lambda_{5i})$ shows the short run dynamics of the model and $\mathcal{E}_{1t}$ is the serially uncorrelated disturbance term.

To confirm the existence of long run cointegrating relationship among the variables, the ARDL approach adopts the bound test which was developed by Pesaran et al. (2001). The test is based on the F-statistic value of the Wald test using a non-standard distribution. If the value of the estimated F-statistic is lower than the bound critical value based on the desired level of significance, the null hypothesis of no cointegration among the variables $(\lambda_{1i} = \lambda_{2i} = \lambda_{3i} = \cdots = \lambda_{6i} = 0)$ is accepted. Conversely, if the calculated F-statistic from the Wald test is greater than the upper bound critical value from the Pesaran et al (2001) table, the null hypothesis is rejected with the conclusion that a long run cointegrating relationship exist among the variables. However, if the value of the computed F-statistic lies within the lower and upper bounds of the critical table value, the decision whether the variables have long run cointegrating relationship becomes inconclusive.

When the variables have no long run cointegrating relationship, the investigation ends up with the ARDL test for short run analysis. However, where the test establishes the existence of cointegration between the variables, the long run model is estimated as follows:

$$\begin{aligned}\Delta LMd_t = {} & \alpha_0 + \beta_{1i} LMd_{t-1} + \beta_{2i} LGREV_{t-1} + \beta_{3i} LGEXP_{t-1} + \beta_{4i} LGDPR_{t-1} + \beta_{5i} LBDEF_{t-1} \\ & + \mathcal{E}_{1t} \qquad (10)\end{aligned}$$

Where: $\beta_{1i} to\ \beta_{5i}$ are the long run parameters and $\mathcal{E}_{1t}$ is the stochastic error term.

The next step is to determine the optimal lag structure by choosing the lag for each variable in a VAR setting using the appropriate specification by Schwarz Information Criteria (SIC). This is followed with the estimation of the ARDL (m, n, o, p, q) and the associated long run multipliers. Thereafter, the error correction model is estimated to arrive at the short run coefficients and dynamics of the model.

3.3. Estimation strategy

The estimation technique for analysis in this study comprises of four steps. The first step involves the stationarity test using the Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1981). The second step is the Autoregressive Distributed Lag Model (ARDL). This is necessary to determine the existence of long-run relationship between the variables of study. The third step is analysis of the long-run Cointegrating equation to determine the impact elasticities of the exogenous variables. The final step involves the ARDL Causality test to establish the direction of causality among the variables. The tests are run over the sample period based on annual data from 1981-2017. Data was collected from CBN Annual Statistics for 2017 Report.

4. Analysis of result

4.1. Stationarity test

From the ADF test statistics, the results in Table 4.1, GDPR is became stationary at level (I(0). All other variables i.e. LMd, LGREV, LGEXP, BDEF are stationary at first difference I(1). Taking account of the varying levels of integration, all variables (with the ADF unit root test values) are statistically significant at, 1%, 5% and 10% critical values at level and first difference. It means that the Johansen cointegration test is not plausible on grounds of the varying levels of stationarity i.e. at orders I(0) and I(1). The adoption the ARDL bound testing exercise would constitute the logical method to examine the variables in the models for long-run equilibrium relationship. According to Pesaran and Shin (1995), unlike the conventional method which uses multiple equations system, ARDL uses reduced form equation and is therefore parsimonious.

Table no. 4.1 – ADF Unit Root Test

Method			Statistic	Prob.*	
ADF - Fisher Chi-square			169.415	0.0000	
ADF - Choi Z-stat			-11.9572	0.0000	
Series	t-stat	Prob.	Order of Integration	Max Lag	Obs
D(Md)	-5.6080	0.0000	I(1)	2	35
D(LNGREV)	-6.5809	0.0000	I(1)	2	35
D(LNGEXP)	-8.5729	0.0000	I(1)	2	35
GDPR	-5.4202	0.0002	I(0)	2	35
D(BDEF)	-7.4386	0.0000	I(1)	2	35
Test critical values:	1% level		-3.6329		
	5% level		-2.9484		
	10% level		-2.6129		

Source: Author's computation

More importantly, Duasa (2007), points that ARDL is applicable irrespective of whether the regressors are purely I(0), purely I(1) or a mixture of both and this makes Johansen Cointegration unsuitable for our case in which the order of integration of our variables is mixed. The existence or absence of cointegration is tested using the Wald F Statistic against Pesaran and Shin (1995) lower and upper bound critical values. Prior to the test, Optimum Lag Selection for the ARDL Model was carried out using the Akai and Schwaz Criteria and produced the following output.

4.2. ARDL test

Table 4.2.1 shows results of the lag selection. Both criteria (Akaike and Schwaz) choose lag 2 and we used the lag in out Bound Testing exercise and Error Correction Model

Table no. 4.2.1 - ARDL Lag Selection

Lag	Akaike	Schwaz
0	4.645545	4.884354
1	4.537585	4.972224
2	4.465934	4.768694
3	4.593100	5.160925
4	4.682506*	5.184845*

** indicates the chosen lag order under each criteria.*

Source: Author's computation

The Wald Test calculated F Statistic is compared against the Pesaran and Shin (1995) lower bound [I(0)] and upper bound [I(1)] critical values at 1%, 5% and 10% level of significance. At all levels of significance, the F Statistic of 5.1488 is greater than the corresponding upper bounds critical values (Table 4.2.2)

Table no. 4.2.2 - Bound Test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.1488	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.50%	3.25	4.49
		1%	3.74	5.06

Source: Author's computation

The result implies that the null hypothesis of no cointegration cannot be accepted at all levels of significance. Therefore, there exist a long run equilibrium relationship running from Demand for money to government revenue, government expenditure, economic growth and budget deficit. The nature of the long run association is established by estimating the vector error correction of the ARDL model. Specifically we did this to determine the speed of convergence of the system back to equilibrium.

4.3. ARDL error correction model

Table 4.3.1 shows the error correction model results. The long run dynamics in the model is shown by the error correction term which measures the convergence of the model to equilibrium. The value of the Adjusted R-Squared shows that fiscal policy variables explain over 74 percent of the variation in the demand for money. The error correction term is negative (-0.4998). The value is less than zero and statistically significant with t-statistic (-5.9250) and probability value (0.0001).

Table 4.3.1 - ARDL error correction Mmodel result (Dependent Variable is D(Md))

ARDL Error Correction Regression Dependent Variable: D(Md) Selected Model: ARDL(1, 4, 4, 4, 4) ECM Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.0258	0.3297	6.1448	0.0001
D(LGREV)	0.5079	0.2304	2.2045	0.0497
D(LGREV(-1))	-0.3460	0.2149	-1.6103	0.1356
D(LGREV(-2))	-0.5761	0.1911	-3.0143	0.0118
D(LGREV(-3))	-0.7420	0.1805	-4.1114	0.0017
D(LGEXP)	-0.3820	0.2220	-1.7204	0.1133
D(LGEXP(-1))	0.7808	0.2262	3.4517	0.0054
D(LGEXP(-2))	0.9704	0.2165	4.4827	0.0009
D(LGEXP(-3))	0.6797	0.2026	3.3548	0.0064
D(LGDP)	-0.1895	0.2204	-0.8597	0.4083

D(LGDP(-1))	-0.0252	0.1784	-0.1411	0.8903
D(LGDP(-2))	-0.2710	0.1819	-1.4897	0.1644
D(LGDP(-3))	-0.6122	0.1940	-3.1561	0.0091
D(BDEF)	-0.0334	0.0137	-2.4297	0.0334
D(BDEF(-1))	0.0040	0.0112	0.3539	0.7301
D(BDEF(-2))	0.0246	0.0104	2.3601	0.0378
D(BDEF(-3))	0.0383	0.0105	3.6667	0.0037
CointEq(-1)*	-0.4998	0.0844	-5.9250	0.0001
R-squared	0.8765	Mean dependent var		0.0178
Adjusted R-squared	0.7365	S.D. dependent var		0.1203
F-statistic	6.2622	Durbin-Watson stat		2.3304
Prob(F-statistic)	0.0004			

Source: Author's computation

This shows evidence of long run causality from the explanatory variables to the dependent variable. The coefficient of -0.4998 shows the convergence to equilibrium. If Money Demand is in disequilibrium, the system converges back to equilibrium at a speed of 49.98% annually. The value of Durbin Watson (2.33) shows that model does not suffer from autocorrelation. The test for the absence of autocorrelation is reinforced using the Breusch-Godfrey Serial Test in Table 4.3.2.

Table no. 4.3.2 – Diagnostic Tests

Dependent Variable: Residuals

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.692754	Prob. F(2,9)	0.1212
Obs*R-squared	12.35422	Prob. Chi-Square(2)	0.0021
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.782883	Prob. F(21,11)	0.6978
Obs*R-squared	19.7714	Prob. Chi-Square(21)	0.5358
Normality Test	Jarque-Bera	0.7116	
	Probability	0.7006	

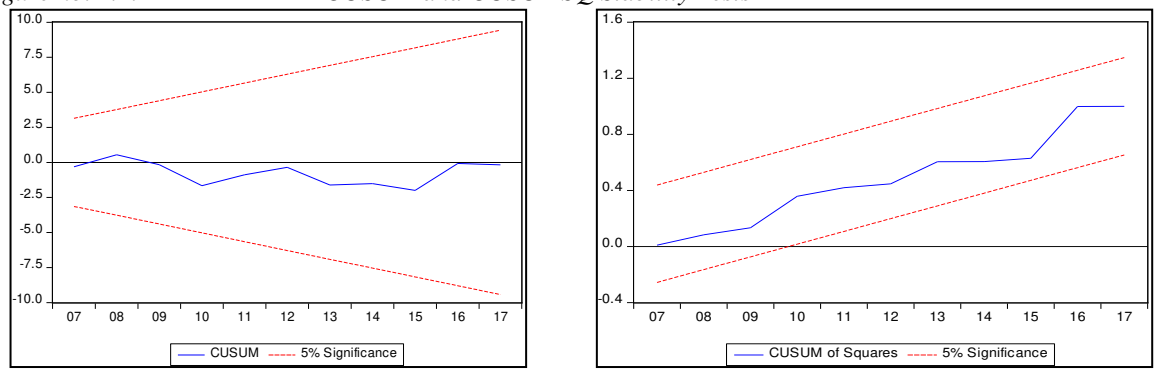
Source: Author's computation

The probability value of the F-statistics of 0.1293 is greater than 0.05 hence, we cannot reject the null hypothesis of no serial correlation on the error correction model. Therefore the model is free of serial correlation. Similarly, the model is free from heteroskedasticity as the probability of F-statistics indicates that we cannot reject the null hypothesis of no heteroskedaticity. The Normality test for the model shows that the value of the Jarque-Bera is 0.7116 with probability of 0.7006 hence, we accept the null hypothesis that the residual series for the model is normally distributed.

4.4. Stability test results

The stability of the model can be observed from the test on the recursive estimates of the ARDL model shown in Figure 4.1. The CUSUM and CUSUM Square tests of Brown et al. (1975) were applied to determine if the money demand function with respect to fiscal determinants for Nigeria is stable over the study period. Whenever the recursive residual of the estimated money demand function is located outside the boundaries of the two critical lines, then we have evidence of parameter instability in that period. As presented in Figure 4.4.1, the CUSUM test shows that the money demand function is stable while the CUSUMSQ test indicates parameter is stable during the period of analysis. Therefore, the parameters of the model exhibit stability during the pre- and post-global crisis periods.

Figure no. 4.4.1 *CUSUM and CUSUMSQ Stability Tests*



Source: Author's computation

Long run Estimates Results. The long run relationship between Money Demand and fiscal variable is shown in Table 4.4.1. While Government Revenue (GREV), Government Expenditure (GEXP and Budget Deficit (BDEF) are significant, GDPR is not significant in explaining the trend in Money Demand (Md) in the long run. However, GREV and BDEF have positive relationship with Money Demand while the relationship with Government Expenditure is negative.

Table no. 4.4.1 *ARDL Long run Estimates*

ARDL Long Run Form and Bounds Test Dependent Variable: D(LBMON) Selected Model: ARDL(1, 4, 4, 4, 4) Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.0258	0.8363	2.4223	0.0339
LMd(-1)*	-0.4998	0.2081	-2.4017	0.0351
LGREV(-1)	1.9404	0.7523	2.5792	0.0256
LGEXP(-1)	-1.9479	0.7932	-2.4558	0.0319
LGDP(-1)	0.0186	0.0267	0.6967	0.5004
BDEF(-1)	-0.0890	0.0402	-2.2141	0.0489

Source: Author's computation

D(LMd) = 2.0258 – 0.4998*LMd(-1) + 1.9404*LGREV(-1) – 1.9479*LGEXP(-1) + 0.0186*LGDP(-1) – 0.0890*BDEF(-1) **(11)**

The effects of fiscal policy variables become significant on the demand for money in the economy at the fourth lag of the explanatory variables. This analysis falls in line with the tenor of democratic governmental changes in Nigeria. The results of the model analysis are captured in equation 11. All the fiscal policy variables in the model are significant in affecting the demand for money in the long run. Following the log relationship between government revenue and government expenditure with the log of demand for money, it is shown that a percentage change in government revenue is accompanied by 194 percent change in the demand for money in the same direction. In the same vein, a percentage change in government expenditure will induce 195 percent change in the demand for money in the reverse direction. This is in line with expectations because government revenue directly constitutes money supply in bank vaults. However, when revenue is expended by government, it constitutes a direct reduction in the available volume of money in circulation. This is reinforced with the understanding that most transactions in the Nigerian economy are not fully monetized.

The effect of budget deficit on demand for money in Nigerian economy has been minimal, negative and significant in affecting the demand for money in Nigeria. A unit change in budget deficit

stimulated 8.9 percent change in the demand for money. The effect of deficit budget has operated for more than two decades over the period of analysis. The level of income positive but not significant in affecting the demand for money.

ARDL Causality. The ARDL Causality is conducted using Wald Test Coefficient Restrictions as the basis for causality among variables. The causality decision is based on the significant effects of the chi-square test results. The result of the causality test is shown in table 4.4.2.

Table no. 4.4.2 ARDL Causality Test

VARIABLE	CAUSAL VARIABLES
Md	GREV, GEXP, BDEF
GREV	Md, GEXP, BDEF
GEXP	GREV
BDEF	GREV, GEXP, Md

Source: Author's computation

The causality test results show that there is bi-directional causality between demand for money and government revenue. Also, there is bi-directional causality between demand for money and budget deficit. Similarly, there is bi-directional causality between government revenue and government expenditure. On the other hand, there is unidirectional causality flowing from government expenditure to money demand. Income did not granger cause the demand for money.

5. Conclusions and recommendations

The study examines the effect of fiscal deficit variables on Money demand in Nigeria. The study sought to establish long run relationship between money demand and fiscal policy variables. In addition, the study also sought to establish the nature of effects of fiscal variables on money demand in Nigeria.

The study established that there was substantial growth in government revenue and government expenditure during the period. The expansion in government activity for the period caused the growth in the demand for money for more than two decades in the Nigerian economy. The fiscal policy variables studied have long run equilibrium with Money Demand (Owoye & Onafowora, 2007). Also, fiscal policy variables explain about 74 percent of the variation in demand for money in Nigeria. However, despite the expansion in money supply, money demand in Nigeria has maintained a stable trend in the Nigerian economy. Empirical results further confirmed that there is long run relationship between money demand and fiscal variable but government expenditure was the main driver of money demand in Nigeria. This study is of the view that fiscal policy has had significant influence and a key determinant of money demand balance in Nigerian economy. It provides insight into the effects of fiscal policy instruments as important components of the demand for money function in Nigeria. Policy makers in the country are encouraged to take into account the influence of fiscal policy variables in planning the target level of money demand and monetary policy. Accordingly, the economy requires further improvement in monetization of financial transactions as government spending is not expected to negatively impact on money demand.

6. References

- Adedotun, P. O., 1997. Nigeria Fiscal Policy, 1998-2010, *NISER Monograph Series 17*, Am.Econ.Rev, 38(3), 245-264
- Bitrus, A, P., 2011A. The Demand for Money in Nigeria, *European Journal of Business and Management* ISSN 2222-2839 (Online) Vol 3, No.6, 2011 63, www.iiste.org
- Bitrus B, P., 2011B. The determinants of the demand for money in developed and developing countries, *Journal of Economics and International Finance* Vol. 3 (15), pp. 771–779, 7 December, Available online at http://www.academicjournals.org/JEIF DOI: 10.5897/JEIF11.118 ISSN 2006-9812

- Brown, R. L., Durbin, J. & Evans, J. M., 1975. "Techniques for Testing the Constancy of Regression Relationships Over Time", *Journal of the Royal Statistical Society*, Series B(37):149–192.
- Carpenter, S. B. & Lange, J., 2002. Money Demand and Equity Markets, *Board of Governors of the Federal Reserve System and Cornerstone Research,* October
- Doguwa, S. I., Olowofeso, O. E., Uyaebo, S. O., Adamu, I. & Bada, A. S., 2014. Structural Breaks, Cointegration and Demand for Money in Nigeria, *CBN Journal of Applied Statistics*, Vol. 5 No.1 (June).
- Duasa, J., 2007. Determinants of Malaysian Trade Balance, An ARDL Bound Testing Approach, *Journal of Economic Cooperation*, 28,3, (2007), 21-40.
- Ebadi, E., 2018. On the Effect of Government Spending on Money Demand in the United States An ARDL Cointegration Approach. *Online at https://mpra.ub.uni-muenchen.de/86399/ MPRA Paper No. 86399*, posted 28 Apr 2018 11:01 UTC
- Pesaran, M. H., Shin, Y. & Smith, R. J., 2001. Bounds testing approaches to the analysis of level relationships, *Journal of Applied Econometrics*, Vol.16, No.3.
- Johansen, S., 1995. "Likelihood-based inference in cointegrated vector autoregressive models". *OUP Catalogue, Oxford University Press.*
- Faridi, M. Z., Bashir, F. & Basit, A. B., 2014. Fiscal determinants of Income Velocity of Money in South Asian Countries: A Panel Data Analysis, *Pakistan Journal of Social Sciences* (PJSS), Vol. 34, No. 2, pp. 715-731
- Friedman, M., 1956. "The Quantity Theory of Money – A Restatement; in M. Friedman (ed): Studies in Quantity theory of Money, *(Chicago University press).*
- Herve, D.B. & Shen Y., 2011. The Demand for Money in Cote d'Ivoire: Evidence from the Cointegration Test, School of International Business and Management, *International Journal of Economics and Finance*, Vol. 3, No. 1; February 2011,
- Humphrey, M. T., 2001. Monetary Policy Frameworks and Indicators for the Federal Reserve in the 1920s, *Cato Journal*, vol. 21 (Fall 2001), https://www.richmondfed.org/~/media/richmondfedorg/publications/research/economic_quarterly/2001/winter/pdf/humphrey.pdf
- Irfan, C., 2003. "Money Demand, Financial Liberalization and Currency Substitution in Turkey". *Journal of Economic Studies,* 30(5):514-534.
- Jhingan, M. L., 2007. The Economics of Development and Planning. (39th ed.). Delhi: Vrinda Publications (P) Ltd.
- Keynes, J. M, 1936. The General Theory of Employment, Interest and Money, Palgrave Mcmillan, OCLC : 62532514
- Lone, N. & Yadav, D.K., 2016. Determinants of Money Supply in India: A Post Reform Scenario, *IOSR Journal of Economics and Finance,* Volume 7, Issue 5, Ver. III (Sep.-Oct. 2016), PP 39-48.
- Mankiw, N. G. & Summers H. L, 1986. Money Demand and the Effects of Fiscal Policies, *Journal of Money, Credit and Banking*, Volume 18, Issue 4 (Nov., 1986), 415-429
- Melnick, R., 1995. "Financial Services, Cointegration, and the Demand forMoney in Israel". *Journal of Money, Credit, and Banking*, 27:140-153.
- Mohsen, B.O. & Gelan, A., 2009. How Stable is the Demand for Money in African Countries? *Journal of Economic Studies*, 36(3):216- 235.
- Nwafor, F., H., Nwakanma, P. N. & Thompson, F., 2007. The Quantity Theory of Money in a Developing Economy: Empirical Evidence from Nigeria', *African Economic and Business Review*, 5:1-9.
- Odior, S. E. & Alenoghena, R. O., 2016. Empirical Verification of Milton Friedman's Theory of Demand for Real Money Balances in Nigeria: Generalized Linear Model Analysis, *Journal of Empirical Economics*, Vol. 5, No. 1, 2016, 35-50
- Owoye, O. & Onafowora, O. A., 2007. Structural Adjustment and the Stability of the Nigerian Money Demand Function. *International Business & Economics Research Journal*, Volume 3, Number 8
- Teriba, A. O., 1992. "Modeling the Demand for Money in Nigeria: An Application on Co-integration and Error Correction techniques (1960-1989)