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DETERMINANTS AND STABILITY OF DEMAND FOR MONEY FUNCTION IN NIGERIA: EVIDENCE FROM AUTOREGRESSIVE DISTRIBUTED LAG (ARDL) MODEL

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Abstract

The study examined the determinants and stability of money demand function in Nigeria using the Autoregressive Distributed Lag (ARDL) modeling. The study was guided by the Expost-facto design. The study used time series data spanning 1986 to 2020 sourced from the Central Bank of Nigeria Bulletins and World Development Indicators (WDI). The ARDL Estimation technique was employed since the ADF unit root test yielded 1(0) and 1(1) orders of integration. The findings revealed that CPI had a significant positive effect on money demand function, while Nominal Interest Rate (NIR) had an insignificant positive effect on stability of money demand in the current period. Real Gross Domestic Product (RGDP) had a significant negative effect on money demand function, while Total Public Debt (TPD) had significant positive effect on stability of money demand function. The study concluded that consumer price index, nominal interest rate, real effective exchange rate, real GDP and public debt are significant determinants of money demand function, and the CUSUM Test indicated that function was stable in Nigeria. The study recommends that monetary authority should lower the nominal interest rates to raise money demand and the economy should be diversifying so as to raise real GDP and reduce public debt in order to ensure stability in the demand for money function in Nigeria.

Keywords: Money Demand Function, Consumer Price Index, Nominal Interest Rate, Exchange Rate, Public Debt

JEL Classification Codes: E41, E52, E58

1. Introduction

Money is considered as the most liquid asset that is at the disposal of economic agents. Money apart from serving as a medium of exchange which is seen as its traditional function right from the days of the classical economists performs other functions in the economy. Economic agents demand money to enable them meet up with their needs and wants that is why it is assumed that the demand for money is a derived demand. Therefore, the Classical economists argued that money is demanded only for the purposes of transaction, the believed that money serves as a yardstick for measuring the value of goods and services

either supplied or demanded at a given price. However, the effectiveness of money in performing this function depends on its value in real terms which also a function of the general price level or current market prices of goods and services in the whole economy. In other words, the demand for money whether from its narrow measure (M1) or broad measure (M2) is a function of many factors, among these is the price level and income at the disposal of economic agents. Ogun (2020) observed that. Accordingly, issues of form and significance of explanatory variables, stability of function, adjustment speed of actual to desired balances and the relative

importance of monetary aggregates have been prominent in the economic literatures.

The stability of money demand function is considered one of the prerequisite conditions for effective implementation of monetary policy. Bhatta (2013) observed that if the relationship between the demand for money and its determinants, which in this case include inflation rate shift around unpredictably, the central bank, loses the ability to derive results from the implementation of its monetary policies. In theoretical economics, discussions on the general prices of goods and services and other determinants of money demand like interest rate, exchange rate and income centred primarily on the stability of money value or its purchasing power which is defined by rate of inflation in the country (Githinji, 2015). Accordingly, Odior and Alenoghena (2016) opined that issues of determinants of money demand and significance of explanatory variables, stability of money demand function and the relative importance of monetary aggregates were among the concern of TATOO debate that started with the empirical studies on Tomori in 1972. The acronyms TATOO money demand debate in Nigeria stands for Tomori, Ajayi, Teriba and Odama who were the first monetary economists to embark on empirical findings of money demand determinants and stability issues in Nigeria.

The inflation and money demand relationship in economic literature assumes an inverse relationship. Consequently, an increase in consumer price index depicts a rise in the general price level and a fall in money value. When money loses its value, holding liquid will be of no value hence people will hold money, rather than invest a substantial part of their money in assets. Conversely, an increase in the consumer prices creates a tendency where households or individuals would demand more money for transactions. Femi (2014) held the view that inflation leads to a general loss of confidence in money and one of its worst evils is that it deprives money of its services as a store of value. More so, economic theory provides that higher interest rate, limits money demand argues that the quantity of money people holds to pay for transactions and to satisfy precautionary and speculative demand is likely to vary with the interest rates they can earn from alternative assets such as bonds. Thus, when interest rates rise

relative to the rates that can be earned on money deposits, people hold less money. Celikoz and Arslan (2011) argued that an increase in the interest rate will ultimately affects the demand for money negatively. This brought to bear the question of whether the nominal interest rate has contributed in anyway in bringing about stability in money demand function, especially now that the Central Bank of Nigeria uses it as the target of monetary policy instruments implementation.

The inclusion of exchange rate in the determination of the money demand function in Nigeria is supported by the heavy dependence of the Nigerian economy on imports. Most consumer and capital goods in Nigeria are imported from all over the world, thereby exposing the country to the risk of negative currency substitution effect. The International Monetary Fund (2018) pointed out that the real effective exchange rate is used for assessing the equilibrium value of a currency, measuring changes in prices or costs competitiveness and in determining the drivers of trade flows. The demand for money may not depends on monetary instruments alone, fiscal policy instruments may play key roles in defining the nature and direction of money demand and its stability. Okwori and Abu (2017) asserted that Nigeria is still characterized by fiscal dominance, weak technical and institutional capacities, and multiplicity of goals. Therefore, the inclusion of public debt as a measure of fiscal dominance in the determination of money demand function and its stability in Nigeria is predicated on the theoretical controversies between the Keynesians and the Ricardian hypotheses. The Keynesians theory argues that fiscal deficit has a positive relationship with demand for money, while the Ricardian hypothesis assumes that these variables have no relationship, indicating that the debate need to be proved empirically using country-specific data.

The Central Bank of Nigeria had for many years used monetary targeting framework that emphasizes the need to regulate money supply using anchors such as interest rates and exchange rates as basis for monetary policy to stabilize the economy (CBN, 2017). However, evidence in literature suggests that the use of monetary targeting recorded little success in Nigeria because the demand for money became unstable due to economic reforms. Nakorji and Asuzu (2019) reported that real broad money demand was ₦0.43 billion in 2010Q1; it

risers to ₦2.66 billion in 2014Q4; it declined slightly to ₦1.46 billion in 2016Q3 and it increased to ₦3.01 billion in 2018Q2. Many scholars (Akpanung & Paul, 2018; Nwude, Offor & Udeh, 2018; Odior & Alenoghena; 2016) in the studies found macroeconomic variables such as income, Gross Domestic Product (GDP), interest rates, consumer price index, nominal exchange rate and foreign exchange rates among others to be the determinants of the stability of money demand function. However, these studies failed to include real effective exchange rate and public debts in the analysis of the determinants and stability of money demand function in Nigeria.

Furthermore, previous studies failed to capture time series data covering 2020 despite the effect of Covid-19 pandemic on the Nigerian economy. Hence, the motivation for the study on the determinants and stability of demand for money function in Nigeria covering 1986 to 2020. Specifically, the objectives of the study include:

- i. To evaluate the determinants of demand for money function in Nigeria
- ii. To find out the extent of the stability of demand for money function

The rest of the study is structured as follows: The immediate section after this introduction discusses the concepts of money and its determinants and stability of money demand function. This is followed by the presentation of the clarified Friedman's theory and the application of the theory to the stability of demand for money in Nigeria. This section is followed by the methodology used, beginning with the design and the model specification and the section after this presents the results and the discussion. The final section concludes and recommends based on findings.

2. Conceptual Issues

Demand for Money

The concept of demand for money refers to people's desire to hold money in liquid cash, rather than in keeping money in form of assets such as bonds, equity, landed properties, or by way of establishing companies which are alternatives to money. Khrawish, Khasawneh, and Khrisat (2012) defined money demand as the desire of households and businesses to hold assets and easily

exchanged the goods and services to liquidity. According to Ahuja (2014), the demand for money arises from the two most important functions of money, namely money acts as a medium of exchange and also serves as a store of value. This means the stability of money function should concentrate on the role of money in serving as a means of transaction and savings. According to Blanchard (2017), demand for money is the amount of money people want to hold; it is often classified under three motives or purposes for holding money are transactionary, precautionary and speculative. Ali (2020) argued that demand for money refers to demand for the real balances. Deducing from this literature, the demand for money means the willingness of economic agents to hold money in liquid, not asset form to meet up daily needs, transact business or take care of emergencies.

Stability of Money Demand Function

The stability of money demand is measured in terms of the stability of money demand determinants such as inflation, income, exchange rate and interest rate among others. Sanya (2013) noted that a stable money demand function provides a framework required for the formulation of efficient monetary policy. In other words, a stable money demand function is a signal that the monetary policy in use is effective or the appropriate policy for achieving monetary goals and macroeconomic stability. Stability of money demand function is important because it can affect the effectiveness of monetary policy. Nduka (2014) asserted that if the money demand function is unstable over time, the income velocity of money will be unpredictable, and the quantity of money may not be a good predictor of economic activity. Consequently, Ogun (2020) stated that the stability of demand for money had been known to be a necessary condition for understanding the choice and effectiveness of monetary policy instruments. Real effective exchange rate and inflation could be considered as key variables in explaining the stability of money demand function. Hence, Bangkok (2014) had noted that the real effective exchange rate is considered more useful in measuring the effect of exchange rate movements on money demand because nominal measures of inflation lead to overvaluation of currencies and induce investors to speculate on devaluation. Inflationary pressure in the economy on

the other hand erodes the value of money, thereby affecting the stability of money demand function.

2.2. Theoretical Framework

This study is hinged on the Friedman Restated Quantity theory of demand for money put forward by Friedman (1956). The theory states that the demand for money is function of the total amount of assets and the expected return on alternative to money assets. This theory assumes that an individual receives income at the beginning of every period and spends this income at a constant rate because there are only two assets, namely cash and bonds. Cash earns a nominal return of zero, but bonds earn an interest rate. Hence, assets like, bonds, shares and goods are alternatives to money; as such they can also be used as means of storing value because the expected return on such assets is higher than the expected return on cash; hence an increase in return on alternative assets relative to liquid or money assets would result in a decrease in demand for money for transactions. According to the theory, the velocity of money is highly predictable and that the demand for money function is highly stable and insensitive to interest rates. The Friedman theory presents the functional implicit relationship between money demand and its determinants as follows:

$$\frac{M}{P} = f(Y, W, R_m, R_b, R_e, E_p, \mu_t) \quad (1)$$

Thus, from the model, M denotes total stock of money demand, P represents the general price level which is a measure of inflation in the economy, Y means real income, W is wealth in non-human form (physical durable goods), R_m is the expected nominal rate of return on money, R_b stands for expected rate of returns on bonds, R_e is expected rate of return on equities, E_p means expected rate of changes in prices of goods and services, μ_t is a variables other than income that may affect the utility attached to the services of money demanded and t denotes the Time period. Milton Friedman's restated theory of demand for money relevant to this research because it defined money as wealth in form of both liquid and assets that has its costs and price for either holding or parting with it. Hence, variables such as interest rate, inflation and real sector variables as important determinants of money demand in the economy.

2.3 Empirical Review

Hezekiah and Agbade (2020) examined the various factors influencing demand for money and the stability of demand for money in Nigeria for the period spanning from 1981 to 2019 using the ARDL Bounds cointegration technique. The results revealed that short term interest rate on deposits; population growth rate and real gross domestic rate had direct and significant effects on demand for money in Nigeria, while lending interest rate had indirect and significant effects on demand for money. This literature captures interest rate, but it failed to examine the role of real effective exchange rate and public debt on the stability of demand for money. Nkalu (2020) investigated demand for real money balances in Africa using panel time series data from Nigeria and Ghana between 1970 and 2014 using Panel Two-Stage Estimated Generalized Least Squares, cross-section Seemingly Unrelated Regression model. The results revealed that inflation, real interest rates, and official exchange rates were statistically significant determinants of real money balances. The relevance of this literature lies on the usage of demand for real balances, but its major weakness is that it failed to use the ARDL technique. Asiedu, Opoku, AbdElghaffar, Bimpong and Yeboah (2020) investigated the stability of money demand in sixteen (16) from 1982 to 2019 in these countries and the feasibility of the proposed West African Monetary Zone using Cointegration and ECM regression. The study found significant heterogeneity and divergence across the sixteen (16) countries and that co-integration of the money demand function was only recorded in Ghana but exhibited partial stability. The study is relevant because it focused on money demand stability, but it while the ECM regression was employed, this study used the ARDL method that captures different order of integration.

Epaphra (2017) examined the determinants of demand for money and its stability in Tanzania using annual time series data spanning from 1966 to 2015. Vector Error Correction Model (VECM) and variance decomposition were employed. The results showed that the demand for real money balances was positively related with real GDP and real exchange rate but responded inversely to opportunity cost of holding

money, the deposit interest rate and inflation rate. The stability test revealed that real money demand function was stable over the periods. This study is relevant to the present research it focuses on stability of money demand, but while VECM was employed, this study used the ARDL regression. Kapingura (2014) examined the stability of the money demand function in South Africa using quarterly data from 1994 to 2012 using the Vector Error Correction Model were used to analyze the long-run and the short-run interaction between the variable. The study found a long-term relationship between the money demand function and its determinants in South Africa. The strength of this work is based on the fact that it focuses on the stability of demand for money function, but its weakness is that it was delimited to South Africa, not Nigeria.

3. Methodology

3.1 Research Design

This study was guided by *expost-facto* design primarily because as an after the action research it concentrated on time series data on variables that the researcher cannot manipulate. That is, the research only used the data already documented and source from secondary sources to analyze the relationship between the stability of money demand function and its determinants in Nigeria.

3.2 Data and Sources

$$Y_t = \beta_0 + \beta_1 Y_{t-i} + \beta_2 X_{t-i} + \beta_3 Z_{t-i} + \sum_{i=1}^p \lambda_i \Delta Y_{t-i} + \sum_{i=1}^p \psi_i \Delta X_{t-i} + \sum_{i=1}^p \phi_i \Delta Z_{t-i} + \varepsilon_t \dots \dots \dots (2)$$

The ARDL model above shows that the current a dependent value of variables like Y, depends on its own lag value and the lag values of other explanatory variables. Therefore, in this model, X and Z are $M2 = f(CPI, REER, NIR, TPD, RGDP) \dots \dots \dots (3)$

3.4 Method of Data Analysis

The study employed the Autoregressive distributed lag regression (ARDL) which is invariant modeling approach as techniques that accommodates different other of

The study used annual time series data spanning the period 1986 to 2020 sourced from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS) and World Development Indicators (WDI) respectively. The period 1986 was selected because it marked beginning of the Structural Adjustment Programme that came with macroeconomic reforms including policy of money demand, while the choice of 2020 was predicated on the fact that it captures the 2016 and 2020 economic recession and the Covid-19 pandemic that ravaged the economy. The demand for money function was measured using Real Broad Money (M2), Consumer Price Index (CPI) used a measure of inflation rate expressed in percentages, Real Interest Rate (RIR) was measured in percentages, Real Effective Exchange Rate (REER) as a measure of currency substitution in a multilateral trade arrangement that takes care of inflation differentials and trade competitiveness was measured using the U.S. Dollar per naira exchange rate in real terms and public debt (PDT) was measured in percentages.

3.3 Model Specification

The specification of the model will follow the autoregressive distributed lag (ARDL) modeling approach to regression analysis. Therefore, the generic form of the ARDL model in its short-run and long-run form is as follows:

explanatory variables whose lag values can affect the dependent variable Y apart from the lag value of the Y variable. The implicit specification of the model is as follows:

integration, 1(0) and 1(1) respectively. The explicit form of the ARDL model based on the empirical study of Aimola and Odhiambo (2021) with modification in terms of variables used is as follows:

$$\ln(M2)_t = \beta_0 + \beta_1 \ln(Md_{t-1}) + \beta_2 \ln(CPI_{t-1}) + \beta_3 \ln(REER_{t-1}) + \beta_4 \ln(NIR_{t-1}) + \beta_5 \ln(TPD_{t-1})$$

$$+ \beta_6 \ln(rGDP_{t-1}) + \sum_{i=1}^p \lambda_i \Delta \ln(Md_{t-1}) + \sum_{i=1}^p \psi_i \Delta \ln(CPI_{t-1}) + \sum_{i=1}^p \phi_i \Delta \ln(REER_{t-1}) + \sum_{i=1}^p \theta_i \Delta \ln(NIR_{t-1})$$

$$+ \phi \ln(rGDP_{t-1}) + \sum_{i=1}^p \phi_i \Delta \ln(TPD_{t-1}) + \delta_i ECM_{t-1} + \varepsilon_t \dots \dots \dots (4)$$

The *a priori* expectation is that the slope of the consumer price index (CPI) as a measure of inflation rate is expected to be positive. This positive sign is expected because at higher rate of inflation people tends to spend their money rather than save it for the future where the real value of money falls. Real effective exchange rate (REER) is expected to have either a positive or a negative elasticity with money demand. The coefficient of the nominal interest rate (NIR) is expected to be negative since at higher interest rate, people hold less cash. The coefficient of real Gross Domestic Product (rGDP) is

expected to be positive because an increase in income raises money demand and the slope parameter for total public debt (TPD) is also expected to be positive in supports of the Neoclassical and Keynesians view of the existence of a positive relationship between budget deficits and money demand in the short-run or long-run. The parameter for the Error Correction Model (ECM_{t-1}) denoted as δ_i is a measure of speed of adjustment from long-run disequilibrium due to a shock to a short-run equilibrium.

4. Results and Discussion

Table 1: Results of Descriptive Analysis

Variables	CPI	M2	NIR	REER	RGDP	TPD % GDP
Mean	76.71502	23.40917	18.52572	110.2644	4.579216	37.96566
Median	45.29161	21.55000	17.95000	99.56126	4.205890	40.30195
Maximum	292.1900	57.78157	29.80000	272.9303	14.60438	120.8353
Minimum	0.868966	-2.010000	10.50000	49.73505	-1.920000	4.950816
Std. Dev.	82.08759	15.99466	3.806866	54.66429	3.898195	31.50511
Skewness	0.474576	0.448242	0.488448	0.319208	0.445919	0.474000
Kurtosis	3.391450	2.605019	2.544839	2.574216	2.728912	2.736958
Jarque-Bera	8.271305	1.876414	8.084838	28.96929	1.267092	2.750849
Probability	0.015992	0.031329	0.017555	0.000001	0.030707	0.022732
Sum	2685.026	819.3210	648.4002	3859.255	160.2726	1328.798
Sum Sq. Dev.	229104.7	8698.195	492.7358	101598.3	516.6613	33747.45
Observations	35	35	35	35	35	35

Source: Author's Computation using Eviews 10.0

The findings in Table 1 revealed that CPI had a mean of 76.72, Md had a mean of 23.41 and NIR had a mean of 18.53percent. It was found also that REER had a mean of 110.26, RGDP had a mean of 4.58 percent point, while

TPD% GDP had a mean of 37.97 percent point respectively. This implies that real effective exchange rate (REER) had a higher mean value.

Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	ADF Coefficient	ADF critical t-stat. Coefficient @ 5% level	Level of Integration	P-value
M2	-3.605063	-2.614300	1(0)	.0109
CPI	-3.671788	-2.956263	1(1)	.0041
NIR	-4.360282	-2.951125	1(0)	.0015
REER	-4.100884	-2.951125	1(0)	.0031

TPD/GDP	-5.941873	-2.954021	1(0)	.0000
RGDP	-7.678915	-2.954021	1(1)	.0000

Source: Author's Computation using Eviews 10.0

The results of analysis in Table 2 revealed that all the broad Money Demand (M2), nominal interest rate (NIR), real effective exchange rate (REER) and total public debt as a percentage of the real GDP (TPD/RGDP) were integrated at level 1(0), while consumer price index (CPI)

as a measure of inflation rate and real GDP as proxy for national income were integrated at their first difference, 1(1). This necessitated the application of the ARDL estimation method based on the rule of thumb.

Table 3: Results of Bounds Cointegration Test

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.193857	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Author's Computation using Eviews 10.0

The results of Bounds cointegration test revealed the coefficient F-statistic as 3.193857. This estimate though greater than the lower bound, 1(0), it was found to be less

than the upper bound, 1(1). In other words, it falls between the lower and upper bounds. Based on this, the results are inconclusive.

Table 4: Results of ARDL Estimation Technique

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
M2(-1)	-0.257507	0.165533	-1.555624	0.2601
M2(-2)	0.535420	0.160367	3.338715	0.0792
CPI	2.250217	0.982281	2.290807	0.0491
CPI(-1)	-2.469381	2.029399	-1.216804	0.3478
CPI(-2)	1.619396	1.070918	1.512156	0.2696
NIR	0.169901	3.921378	0.043327	0.9694
NIR(-1)	-8.905096	1.330181	-6.694648	0.0216
NIR(-2)	-9.892393	2.463233	-4.016020	0.0568
REER	-0.318658	0.080429	-3.961964	0.0482
REER(-1)	-0.528351	0.066293	-7.969911	0.0154
REER(-2)	0.022662	0.114329	0.198217	0.8612
RGDP	-5.637808	0.627488	-8.984723	0.0122
RGDP(-1)	3.574867	1.759044	2.032278	0.1792
RGDP(-2)	3.015034	1.498801	2.011631	0.1819
TPD	1.328362	0.319052	4.163465	0.0531
TPD(-1)	-0.823279	0.324007	-2.540928	0.1262
TPD(-2)	0.471424	0.942110	0.500391	0.6664
C	501.5679	83.18719	6.029389	0.0264
R-squared	0.996262	Mean dependent var		24.31106
Adjusted R-squared	0.943935	S.D. dependent var		16.09977
S.E. of regression	3.812099	Akaike info criterion		4.644365
Sum squared resid	29.06419	Schwarz criterion		5.985836
Log likelihood	-42.98765	Hannan-Quinn criter.		5.081651

F-statistic	19.03918	Durbin-Watson stat	1.759540
Prob(F-statistic)	0.051075		

Source: Author's Computation using Eviews 10.0

The findings from the ARDL estimation revealed that the effect of lag values of M2 on the current value of M2 was negative at lag one and positive at lag, but statistically insignificant ($p > 0.05$). However, CPI had a significant positive effect on money demand function in Nigeria and it was insignificant, but negative at lag one. Also, Nominal interest rate (NIR) at lag one had significant negative effect on money demand function, but in the current period, the effect was found to be positive, but insignificant ($p > 0.05$). Also, REER at lag one had a significant negative effect ($p < 0.05$), and real Gross Domestic Product (RGDP) had a significant negative

effect on money demand function. Furthermore, the results revealed that total public debt as a percentage of the GDP (TPD) had a significant positive effect on money demand function. The results of the adjusted R square estimated as 0.943935 means that 94.39 % of the changes in the demand for broad money function (M2) and its stability were explained by its identified determinants. The F-statistic shows that the overall model was found to be significant ($p < 0.05$), and the Durbin Watson (DW) coefficient of 1.759540 means there was no serial correlation in the model to make it spurious.

Table 5: Results of Model Diagnostic Tests

Test Statistic	Test	Coefficient	P-value	Decision
Breusch-Godfrey LM (F-Stat.)	Serial Correlation	0.205257	.8161	No. S.C
Breusch-Pagan Godfrey	Heteroskedasticity	0.562051	.8266	No. HRT
Ramsey RESET	Model Specification Error:			
	t-stat.	0.818327	.4224	No. S. E
	F-Stat.	0.66966	.4224	No. S. E

Note: S.C=serial correlation, HRT=Heteroskedasticity and S. E= specification error

The model diagnostic tests revealed that there was no serial correlation ($p > 0.05$), the model was not heteroskedastic and both the t-statistic and F-statistic of

the Ramsey RESET test indicated that there was no specification error or the model was correctly specified in its linear form.

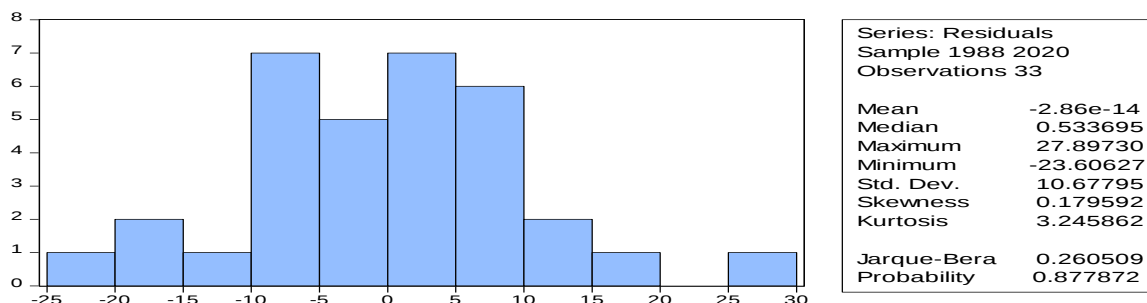


Figure 1: Normality Test

The normality test results represented by the histogram revealed that the Jarque-Bera statistic has $p > 0.05$, which means that the null hypothesis that the distribution was

normally distributed is accepted. The Skewness and kurtosis also supported the findings since they lie between zero and three respectively.

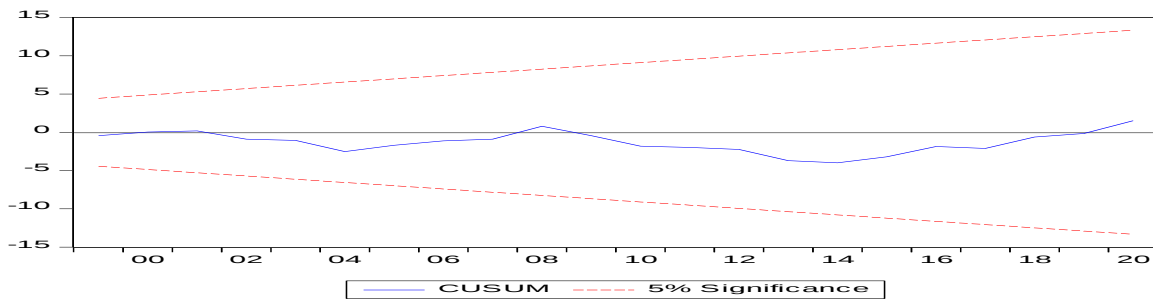


Figure 2: CUSUM Parameter stability plot

The results established that both the CUSUM test indicated that the parameters estimated were found to be stable at 0.05 level since the stability graph or curve lies between the positive and negative boundary lines at 5% level of significance.

4.1 Discussion of Findings

The results of analysis revealed the consumer price index (CPI) was found to have significant positive effect on money demand function in Nigeria and it was insignificant, but negative at lag one. This means CPI has effect on the demand for money function even though the effect was not significant. This supports Ogun (2020) who found that relative prices play important in explaining the demand for monetary aggregates and its stability. The study also established that nominal interest rate (NIR) at lag one had significant negative effect on money demand function, but in the current period, the effect was found to be positive but insignificant ($p > 0.05$). Nkalu (2020) in their study found that inflation, real interest rates, and official exchange rates to be statistically significant determinants of real money balances. Furthermore, the findings revealed that REER at lag one had a significant negative effect ($p < 0.05$). Epaphra (2017) also found in their study that the demand for real money balances was positively related with real GDP and real exchange rate.

Furthermore, it was revealed that real Gross Domestic Product (RGDP) had a significant negative effect on money demand function in Nigeria. Githinji (2015) in their study reported that interest rate volatility, GDP, inflation rates, financial innovation and exchange rates were statistically significant, while interest rates and population growth rates were insignificant in determining money demand. Similarly, the findings showed that total

public debt as a percentage of the GDP had a significant positive effect on money demand function. This implies that an increase in public debt raises the demand for cash balances in the economy. The study therefore established that consumer price index (CPI), real effective exchange rate (REER), real Gross Domestic Product (RGDP) and public debt were found to be significant determinants of money demand function in Nigeria. The study also revealed that the demand for money function was found to be stable in Nigeria.

5. Conclusion and Recommendations

The findings from this empirical study revealed that consumer price index (CPI) was found to have significant positive effect on money demand function. The results revealed that TPD as a percentage of GDP had a significant positive effect on money demand function, while real Gross Domestic Product (RGDP) had a significant negative effect on money demand function. The study concluded that consumer price index, nominal interest rate, real effective exchange rate, real GDP and public debt are significant determinants of stability of money demand function in Nigeria, and the function was found to be stable in Nigeria.

The following among others have been recommended based on the findings:

- i. The Central Bank of Nigeria as the monetary authority should reduce the nominal interest rates and initiate measures that will ensure stability in real effective exchange rate in order to raise money demand and enhances the stability of the function
- ii. There is need for the diversification of the economy to stabilize prices, raise the level of real

GDP and reduce the public debt burden so as to

stabilize the money demand function in Nigeria.

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