

MONEY SUPPLY IN NIGERIA: DO INSTITUTIONAL QUALITY AND GOVERNMENT EXPENDITURE MATTER?

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Abstract

This study investigates the role of institutional quality and government spending in money supply determination in the Nigeria economy. The study employed the Fully Modified Ordinary Least Squares and the Error Correction mechanism for long run and dynamic short run relationships for the period spanning 1981 to 2021. The empirical results obtained, using the Ordinary Least squares and Dynamic OLS methods indicate, amongst others, that institutional quality significantly and inversely determines money supply, government spending stimulates money supply, high powered money is the most significant positive determinant of money supply, the monetary policy rate and currency reserve ratio negatively impact money supply and that the liquidity ratio does not significantly affect money supply. The study recommends that in pursuance of discretionary monetary policy by the monetary authorities, aside the maneuvering of monetary policy instruments, fiscal regime and institutional considerations are vital to attaining the desired monetary targets in Nigeria. The effective harmonization of fiscal and monetary policies is, accordingly, strongly to policy makers in the country for thoughtful consideration.

Keywords: Money Supply, Institutional quality, Government spending, Ordinary Least squares, Error correction model

JEL Classification: E41, E42, E51, G21

1. INTRODUCTION

Money supply is both a monetary policy indicator and target variable. It is used by monetary authorities in developed and developing economies to influence aggregate macroeconomic variables to achieve broad monetary and macroeconomic objectives such as economic growth, potential output, price stability and balance of payments equilibrium (Anyanwu, 1993).

In the theoretical literature, money supply is determined by the banking sector, the monetary authority and the non-bank public. The exogeneity of money supply is explained by the fact that it is determined essentially by the monetary authority through the influence of the money multiplier and high-powered money. A stable money multiplier guarantees controllability of money supply by the monetary authorities through the manipulation of the monetary base. This implies the exogeneity of money supply, a view that was held by the Classical economists, Keynesians and Monetarists until the onset of the global financial crisis in 2008. The endogeneity of money supply connotes the ineffectiveness of monetary policy by the monetary authorities as a result of the instability and unpredictability of the money multiplier, and the consequent focusing on bank credit and other endogenous determinants of changes in money supply. Asset and liabilities management decisions of the commercial banks and the portfolio decisions of the non-bank public are also endogenous determinants of money supply. Post Keynesians posit that macroeconomic variables such as income and economic activities also determine money supply (Grishchenko, Mihailov and Tkachev, 2021; Ongan and Grocer, 2019; Bachurewitz, 2019; Komain, 2019; Elhendawy, 2016; Palley, 2013; Fontana, 2003 and Moore, 1989).

Attention of policy makers, monetary authorities and researchers has begun to shift from the traditional determinants of money supply to macroeconomic and other factors which erstwhile have not been explored (Ifionu and Akinpelumi, 2015; Howells, 2010 and Minsky, 2008). Activities that affect government balance sheet such as purchases of assets (both real and financial) through the apex regulatory financial institution, which also acts as the custodian of government accounts, has been found to influence the supply of money (Elhendawy, 2016). The independence of monetary authorities is indicative of the level of institutional quality in a country and could also have a bearing on pressures on the monetary authority to increase money supply. These are grounds that have been rarely explored in literature. This study, therefore, undertakes an empirical examination of the impact of institutional quality and government expenditure on the determination of money supply with focus on Nigeria.

2. MONEY SUPPLY AND HIGH-POWERED MONEY IN NIGERIA

2.1. MONEY SUPPLY IN NIGERIA

Money supply in Nigeria is viewed from the angle of the aggregation of the narrow and broad definitions, in line with the theoretical literature. The narrow definition includes currency held outside the bank by the non-bank public and demand deposits in banks. Broad money includes narrow money in addition to savings, time deposits and foreign denominated deposits. Accordingly, money supply in Nigeria is defined along the lines of the broad definition, that is, demand deposit in the banking sector, savings and time deposit, and foreign-denominated deposits in addition to currency held by the non-bank public (Central Bank of Nigeria, 2006). Narrow money supply (M1) in Nigeria includes currency outside the

bank (currency in circulation, less currency held in the vaults of commercial banks, merchant banks, non-interest banks, primary mortgage banks and microfinance banks) and demand deposits (including private sector deposits at the CBN, commercial banks, merchant banks, non-interest banks, primary mortgage banks and microfinance banks). Broad money (M2) in Nigeria includes quasi money to the narrow definition of money (Central Bank of Nigeria, 2021). A broader definition was introduced in 2007 in line with the IMF's Standardized Report Form (SRF) called Depository Corporations Survey. Securities other than shares was added to the broad money definition and termed M3. Based on the SRF, narrow money (M1) definition is categorized as currency outside depository corporations and transferable deposits. Other deposits added to M1 make up M2 while the inclusion of securities other than shares to M2 makes up M3 in Nigeria. The data in Table 1 below shows the composition of and the growth in Money supply in Nigeria between 1986 and 2020

Table 1: Money Supply in Nigeria (1986 - 2020)

Period	Narrow Money (M1)	% Change in M1	Broad Money (M2)	% Change in M2
1986 – 1990	20.15	91.50	40.08	107.21
1991 – 1995	106.83	430.18	179.04	346.72
1996 – 2000	333.11	211.81	568.82	217.70
2001 – 2005	1,141.77	242.77	1,940.38	241.12
2006 – 2010	3,969.35	247.65	7,766.15	300.24
2011 – 2015	6,997.62	76.29	15,951.57	105.40
2016 – 2020	10,087.74	44.16	26,071.94	63.44

Note: The data are 5-yearly average from the CBN statistical bulletin, 2021. M1 and M2 are expressed in N billion.

Source: Authors' calculation (2023)

Table 1 shows money supply in Nigeria at levels and percentage growth rate for 5-yearly non-overlapping period spanning 1986 to 2020. Data from 1986 were chosen because prior to 1986, the financial sector was highly underdeveloped and over regulated. Consequently, direct monetary instruments such as selective credit controls, fixed interest and exchange rates, special deposits and credit ceilings were in force.

From an average of N20.15 billion, narrow money rose to N106.15 billion, representing a growth of 430.18% from the 1986 – 1990 to the 1991 – 1995 periods respectively. This quantum leap represents the highest growth of narrow money during the entire period under review. The growth in narrow money declined to 211.81% in the 1996 – 2000 period, increased to 247.65% in 2006 – 2010 period and had been on a decline since then. Broad money followed somewhat the same trajectory during the 1986 – 2020 period. The growth of broad money peaked within the 1991 – 1995 period, averaging 346.72%. It declined to 217.70% within the 1996 – 2000 period, increased to 300.24% in 2006 – 2010 period and has also been on a decline since. The large changes witnessed in narrow and broad money during the

1986 to 1995 period could be as a result of the aftermath of the introduction of Structural Adjustment Programme that focused on market-oriented financial system, the deregulation of interest and exchange rates and the consequent rise in liquidity. The monetary expansion experienced in 2001 to 2010 was due to the monetization of enhanced oil receipts during the period.

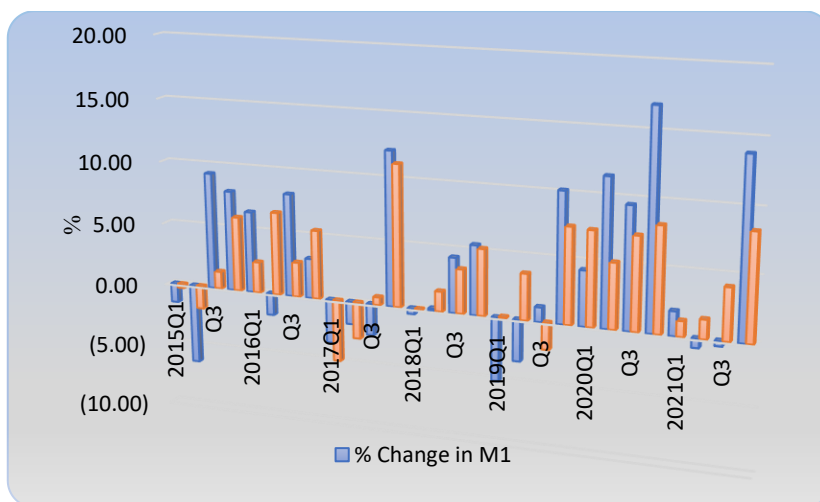


Figure 1: Trend of Changes in Nigeria's money supply (2015Q1 - 2021Q4)

Source: Authors' calculations (2023)

In Figure 1, the trend of quarterly changes in Nigeria's narrow and broad money are presented. It is evident that eleven negative growths were witnessed during the period 2015Q1 to 2021Q4 for narrow money while only 6 negative growths were observed for broad money. The worst decline of -6.33% in narrow money was recorded in the second quarter of 2015 (2015Q2) while that for the broad money, which stood at 4.88% was recorded in 2017Q1. The sharpest positive increase in the growth of narrow and broad money occurred in 2020Q4 and 2021Q4 with growth rates of 16.84% and 8.33% respectively. This shows that the beginning of the current democratic dispensation witnessed negative monetary growth whereas the growth of money has continued to rise at a rapid pace as the current administration winds up.

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Table 2: Decomposition of Money Supply in Nigeria (2015 - 2021)

Year	Currency outside depository corporations (1)		Transferable Deposits (2)		Other Deposits (3)		Securities other than Shares (4)		Total Money Supply (M3)
	N'billion	Share of Total MS(%)	N'billion	Share of Total MS(%)	N'billion	Share of Total MS(%)	N'billion	Share of Total MS(%)	
2015	1458.04	6.85	6377.17	29.96	11763.92	55.26	1689.11	7.93	21288.24
2016	1822.94	6.49	7316.09	26.05	14034.23	49.97	4910.65	17.49	28083.91
2017	1782.66	6.26	7697.36	27.03	14464.64	50.80	4529.00	15.91	28473.66
2018	1907.35	5.83	8494.64	25.95	16053.43	49.03	6284.21	19.19	32739.63
2019	2022.64	5.80	8625.77	24.75	18229.53	52.31	5972.94	17.14	34850.88
2020	2495.61	6.41	13342.79	34.30	21990.48	56.52	1076.04	2.77	38904.92
2021	2938.42	6.71	15230.88	34.76	25648.26	58.53	0.91	0.002	43818.47

Note: The sum of (1) and (2) equals narrow money (M1); the sum of (1), (2) and (3) is M2 while the sum of (1), (2), (3) and (4) is M3. M2 and M3 are the broad definitions of money.
Source: Authors' calculations (2023) based on data from CBN Statistical Bulletin (2021)

Table 2 shows the decomposition of total money supply in Nigeria from 2015 to 2021. From the Table, other deposits (including quasi money) dominated money supply during the period under review. This is followed by transferable deposits (demand deposits). The differentiating factor between M2 and M3 (securities other than shares) increased in proportion to total money supply from 7.93% in 2015 to 19.19% in 2018 representing the third most important component. However, the value had declined to approximately zero percent in 2021. This development has approximated M3 to M2 in Nigeria since 2021.

2.2. HIGH-POWERED MONEY IN NIGERIA

High-Powered money also referred to as Monetary Base (MB) is the monetary policy tool with which the monetary authority controls money supply in Nigeria. Changes in MB are determined by currency in circulation and liabilities of the monetary authority to other depository corporations.

Table 3: High Powered Money and its components in Nigeria (2010 -2021)

Year	Total High-Powered Money (MB) N'billion	% Change in MB	Currency in Circulation		Liabilities to other Depository Corporations	
			N'billion	Share of Total Monetary Base	N'billion	Share of Total Monetary Base
2010	1,939.38	14.29	1,378.22	71.07	561.15	28.93
2011	2,905.96	49.84	1,566.05	53.89	1,339.92	46.11

2012	3,705.06	27.50	1,631.72	44.04	2,073.35	55.96
2013	5,185.94	39.97	1,776.41	34.25	3,409.52	65.75
2014	5,840.89	12.63	1,797.98	30.78	4,042.92	69.22
2015	5,758.71	-1.41	1,857.94	32.26	3,900.77	67.74
2016	5,848.03	1.55	2,179.17	37.26	3,668.86	62.74
2017	6,483.80	10.87	2,157.23	33.27	4,326.57	66.73
2018	7,180.01	10.74	2,329.71	32.45	4,850.31	67.55
2019	8,680.95	20.90	2,442.99	28.14	6,237.97	71.86
2020	13,107.92	51.00	2,908.46	22.19	10,199.46	77.81
2021	13,295.15	1.43	3,325.16	25.01	9,969.99	74.99

Source: Authors' calculations (2023) based on data from CBN Statistical Bulletin (2021)

Although monetary base grew from N 1939.38billion to N 13295.15 billion within the 2010 to 2021 period, representing a 585.54% growth during the entire period, its annual percentage change rose from 14.29% in 2010 to 49.84% in 2021. It is interesting to note that the recent growth in high powered money is as a result of liabilities to other depository corporations, which has increasingly grown in proportion relative to currency in circulation. Currency in circulation made up 71.07% of total high-powered money in 2010 while depository corporations' deposits amounted to 28.93%. By 2021, the trend had changed dramatically with depository corporation's deposits representing 74.99% while money in circulation stood at 25.01% of monetary base, respectively. This change in relative composition of the monetary base has implications for the ability of the monetary authorities to control money supply in Nigeria.

3. LITERATURE REVIEW

3.1. THEORETICAL LITERATURE

The theoretical explanations of the determinants of money supply is as broad as the concept of money itself. It cuts across the broad spectrum of the Classical, Monetarist, Keynesian and Post Keynesian theories. To the classical economists, money is a veil and is exogenously determined by the monetary authorities and, therefore, it is taken as a given. Its determination depends on the statutory reserve ratios such as the cash reserve ratio, the liquidity ratio and bank reserves. The monetarists hold the opinion that the monetary base or the high-powered money, consisting of the currency in circulation and reserves determine money supply. To the Keynesians, money supply is also exogenously determined. Their theory was basically demand-sided with emphasis on liquidity preference. The post Keynesians identified interest rate, output and economic activities (which influence liquidity preference) as the main factors responsible for money supply (Faure, 2013; Handa, 2009; Panagopoulos and Spiliotis, 2008; Fontana, 2003; Gupta, 1976 and Cagan, 1965).

Goodhart (2017) identified four money supply theories. The first is called 'deposit cause loans' theory. This theory, also referred to as the commercial banks' theory of banks' passivity, hinges on bank's reliance on deposits from cash and cheques drawn on other banks. The theory is more of a micro rather than macro theory, reason for which researchers appear not to see it as a theory of the determination of aggregate money supply. The second is the money base and

multiplier which explain changes in MS. The emphasis of this theory is that the high-powered source of payment settlement is under the control of the central bank. The private sector is only allowed to distribute it between bank reserves and currency ratio. Given that the reserves with the monetary authority and the currency ratio has no yield, *ceteris paribus*, the theory holds that banks should hold a stable minimum reserve and that the public holds a stable currency ratio. Changes in high-powered money is expected to result in a proportionate change in money supply which is necessitated by the money multiplier. The 2008 global financial crisis was, however, accompanied by unstable currency and reserve ratios, prompting the argument that this theory is dead (Faure, 2013). The third theory is the credit counterpart which sees money supply as the residual outcome of all other external forces at play in banks' balance sheet. Another of the theories is the 'loan create deposits' theory referred to as the new paradigm, which gives commercial banks the freedom to become more or less expansionary, especially to the private sector. Such credits simultaneously reflect as loan on the asset side and deposit on the liabilities side of the balance sheet, hence the 'loans create deposit' paradigm.

Howells (2010) opined that for money supply to be endogenous, the causes of money expansion or contraction must lie with other variables within the economy, necessitating focus of attention on variables in the economy that could determine money supply. Adediyin (2020) identified financial development while Ifionu and Akinpelumi (2015) found exchange rate and gross domestic product as determinants of money supply. Our objective in this study is contributing to the growing literature on the determinants of money supply in Nigeria, focusing in so doing on such unconventional variables as quality of institutions and government.

3.2 REVIEW OF EMPIRICAL LITERATURE

Most known empirical studies on the determinants of money supply are based on the ability of monetary authorities to control money supply in the economy through the monetary base and the money multiplier models. The study by Zinn (2022) who investigated the usefulness of the money multiplier in the United States economy, using data that covered the 1959-2021 sample period is an example in this regard. He found, amongst others, that the money multiplier is a useful measure of financial intermediation.

Exploring the possible existence of a non-linear relationship between the monetary base and money supply within the framework of an Autoregressive Distributed Lag Model (ARDL) and using Canadian data that covered the 2000M1 to 2018M9 period, Onger and Gocer (2019) found a non-linear stable money multiplier which confirms exogeneity in the determination of money supply, Komain (2019) in a similar study found a non-linear stable money multiplier for Thailand for the period 1997M1 to 2017M12.

By contrast, Grishchenko, Mihailov and Tkachev (2021) did not find a stable money multiplier for the Russian economy in the post global financial crisis period. They found that money supply is endogenously determined by demand for credit. Other studies in support of endogeneity of money supply include; Chai and Hahn

(2018); Bachurewicz (2019); Deleidi and Levrero (2017); Elhendawy (2016); Lone and Yadav (2016); Badarudin, Ariff and Khalid (2013) and Faure (2013).

Adediyan (2020) extended the literature on the determinants of money supply to include the influence of financial liberalization. In a study of the determinants of money supply in Nigeria, employing the ARDL approach and using data that covered the 1980 to 2019 sample period, he found financial liberalization to be a significant determinant of money supply in Nigeria. Ifioni and Akinpelumi (2015), in an examination of the effects of macroeconomic variables on money supply in Nigeria found that while exchange rate and gross domestic product exert positive effects, the impact of inflation was negative. Jha and Rath (2001) traced the endogeneity of money supply in India, using such macroeconomic variables as wealth and income, market interest rate and discount rate and with data that covered the April 1980 to March 2000 sample period.

From the foregoing, studies supporting the exogeneity-of-money-supply argument find the money multiplier and high-powered money as the determinants of money supply (supporting the ‘deposits make bank loans’ hypothesis) while those supporting the endogeneity argument find bank credit/loans, interest rate and credit demand to be the determining variables (supporting the ‘bank loans make deposit hypothesis’). Few studies examined the nexus between macroeconomic factors and money supply. None, to the best of our knowledge, however, has investigated the relationship between institutional quality and government expenditure. This is where this study sets out to contribute. In doing this, we bring empiricism to bear on an examination of the linkage between institutional quality, government expenditure and money supply in Nigeria.

4. METHODOLOGY

The study adopts a modified version of Adediyan’s (2020) money supply model in which he captured the perspectives of the Classical, Monetarist, Keynesian and Post Keynesian on the determinants of money supply. We augment the traditional money supply equation by introducing a financial liberalization (FL) variable, in addition to utilizing the reserve ratio (RR), monetary base (H), liquidity ratio (LR), currency ratio (CR), interest rate (R) as explanatory variables (see equation 1)

$$MS = f(RR, H, LR, CR, R, FL) \quad 1$$

Modifying equation 1 to include total government expenditure and institutional quality, the general form of the baseline money supply model is presented as Equation 2.

$$MS = f(TGE, CL, H, MPR, CR, LR) \quad 2$$

Where MS is money supply, TGE is total government expenditure, CL is civil liberty, H is high powered money, MPR is monetary policy rate, CR is currency ratio and LR is liquidity ratio.

Taking the natural log MS, TGE, CL and H and expressing in econometric form,

$$\ln MS = \beta_0 + \beta_1 \ln TGE + \beta_2 \ln CL + \beta_3 \ln H + \beta_4 MPR + \beta_5 CR + \beta_6 LR + \mu \quad 3$$

From Equation 3, it should be noted that civil liberty is proxy for institutional quality. Civil liberty is a social capital dimension of institutional quality which is widely used in literature (Aron, 2000 and Bartlett, Cuckovic and Jurlin, 2016). It encapsulates freedom of assembly, political rule of law, guaranteed personal right, freedom of political organization, guaranteed socioeconomic rights, freedom of religion, freedom of private organization, free trade unions, freedom of open public discussions. no censorship, no gross inequality and no government indifference. Civil liberty is measured on a one to seven scale where one represents the highest degree of freedom and 7 represents the lowest (Freedom House, 2021). Soumare (2015), Isham, Kaufmann and Pritchett (1997) and Barro and Lee (1994) used civil liberty as proxy for institutional quality in their empirical analyses. The justification for the inclusion of government expenditure in the money supply model in Equation 3 is that monetary authorities' desire for increasing reserves are usually to finance government spending which has been on a northward trajectory in Nigeria. Cagan (1965) posits that government fiscal activities bear on high-powered money which is a key determinant of money supply. From Keynesian perspective, increases in aggregate demand that is generated by increased government fiscal operations enhance income and the increase in income could stimulate the velocity of circulation of money (Okafor et al., 2013 and Gali, Lopez-Salido and Valles, 2004). Musa, Usman and Zoramawa (2014) found a nexus between fiscal operations of the government and monetary authorities' monetary policy operations.

Money supply, total government expenditure, civil liberty and high-powered money are expressed in log form for normalization, hence the coefficient of $\ln TGE$, $\ln CL$ and $\ln H$ will be interpreted as elasticities. Given that MPR , CR and LR are in ratios, expressing them in log form will not necessary. β_0 is the intercept term. $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are the coefficients of the explanatory variables respectively. It is expected that whereas β_1 and β_3 are positive, β_4, β_5 and β_6 are negative, β_2 could take any form. μ is the stochastic error term.

We utilize the Fully Modified Ordinary Least Squares (FMOLS) as the estimation technique. The choice of the FMOLS technique is predicated on the fact that it provides estimates which address serial correlation and endogeneity concerns usually found in cointegrating relationships (Abusomwan and Ohihon, 2022). The Ordinary Least Squares (OLS) and Dynamic Ordinary Least Squares (DOLS) techniques are utilized as robustness check of the baseline model.

Error Correction Model is estimated for the short run dynamic relationship between institutional quality, government expenditure and money supply. Tests for stationarity and cointegration are conducted using the Augmented Dickey Fuller unit root test and Johansen cointegration (Johansen, 1988 and Johansen and Juselius, 1990). The ECM, specified as Equation 4, is conditional on the existence of cointegrating equations in the model (Abusomwan and Ezebuihe, 2017).

$$\begin{aligned} \Delta \ln MS_t = & \pi + \sum_{i=1}^m \sigma_i \Delta \ln TGE_{t-1} + \sum_{i=1}^n \lambda_i \Delta \ln CL_{t-1} + \sum_{i=1}^p \tau_i \Delta \ln H_{t-1} \\ & + \sum_{i=1}^q \delta_i \Delta MPR_{t-1} + \sum_{i=1}^r \alpha_i \Delta CR_{t-1} + \sum_{i=1}^r \beta_i \Delta LR_{t-1} \\ & + \psi ecm(-1) + \mu_i \end{aligned} \quad 4$$

All the variables are as explained in the long run model (Equation 3). Δ is the lag operator, $ecm(-1)$ is the one period lag of the residual from equation 3, π is the constant term, $\sigma, \lambda, \tau, \delta, \alpha$ and β are the short run dynamic parameters with expected signs as in Equation 3 while ψ is the speed of adjustment from temporary disequilibrium and is expected to be significant with a negative value.

The data on the variables in the specification were sourced mainly from the 2021 edition of Statistical Bulletin, published by the Central Bank of Nigeria (CBN) and the Freedom House (2021) database.

Table 4: Descriptive Statistics

Variable	Observation	Mean	Median	Standard Deviation
Money Supply (MS)	41	8613.61	1315.870	12337.45
Total Government Expenditure (TGE)	41	2494.30	1018.000	3189.892
Civil Liberty (CL)	41	4.610	5.000	0.833
High-Powered Money (H)	41	2185.68	545.880	3401.263
Monetary Policy Rate (MPR)	41	13.000	13.000	3.960
Currency Ratio (CR)	41	56.969	59.261	27.910
Liquidity Ratio (LR)	41	49.070	46.230	14.668

Note: These are raw data before the log transformation

Source: Authors' computations using Eviews 10 (2023).

Table 4 shows the descriptive statistics of the data on the variables in the specification. Money supply, total government expenditure and high-powered money averaged N8613.61 billion, N2494.30 billion and N2185.68 billion, respectively. Monetary policy rate, currency ratio and liquidity ratio averaged 13%, 56.97% and 49.7% respectively during the period while civil liberty (with value 1 for civil freedom and 7 for 'unfree') with a value of 4.61 reflects high level of institutional weakness.

5. THE EMPIRICAL RESULTS

Stationarity Test Result

Table 5: Unit Root Test Result (Trend and Intercept)

Variable	AUGMENTED DICKY FULLER TEST						PHILIP PERRON TEST					
	LEVELS			FIRST DIFFERENCE			LEVELS			FIRST DIFFERENCE		
	Test Stat	5% Critical Value	Remark	Test Stat	5% Critical Value	Remark	Test Stat	5% Critical Value	Remark	Test Stat	5% Critical Value	Remark
lnMS	-0.8	-3.53	Not stationary	-3.8	-3.53	Stationary	-0.5	-3.52	Not stationary	-3.92	-3.53	Stationary
	52	0		37	3	I(1)	56	7		7	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
lnTGE	0.4	-3.53	Not stationary	7.9	-3.53	Stationary	0.8	-3.52	Not stationary	7.84	-3.53	Stationary
	05	0		62	3	I(1)	29	7		2	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
lnCL	4.9	-3.53	Not stationary	5.8	-3.53	Stationary	3.2	-3.52	Not stationary	5.49	-3.53	Stationary
	13	0		49	3	I(1)	67	7		9	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
lnM	2.2	-3.53	Not stationary	3.9	-3.53	Stationary	1.5	-3.52	Not stationary	3.61	-3.53	Stationary
	05	3		52	7	I(1)	82	7		9	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
MPR	3.3	-3.52	Not stationary	8.7	-3.53	Stationary	3.2	-3.52	Not stationary	8.87	-3.53	Stationary
	38	7		48	0	I(1)	57	7		7	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
CR	2.7	-3.52	Not stationary	7.0	-3.53	Stationary	2.7	-3.52	Not stationary	6.93	-3.53	Stationary
	37	7		10	0	I(1)	44	7		5	0	I(1)
	-	-	Not stationary	-	-	Stationary	-	-	Not stationary	-	-	Stationary
LR	3.6	-3.52	Not stationary	7.6	-3.53	Stationary	3.6	-3.52	Not stationary	13.8	-3.53	Stationary
	69	7		02	0	I(1)	91	7		66	0	I(1)

Source: Authors' computations using Eviews 10 (2023)

The stationarity test results, reported in Table 2, shows clearly that whereas the variables were not all stationary at levels, they became stationary at first difference [I(1)] using both the ADF and Philip Perron tests.

Johansen Cointegration Test Result

Table 6. Johansen Cointegration Test Result

No. of Cointegrating Equation(s)	Eigenvalue	Trace		Maximum Eigenvalue	
		Test statistic	0.5 critical value	Test statistic	0.5 critical value
None	0.703	156.924*	125.615	47.398*	46.231
At most 1	0.609	109.526*	95.754	36.650	40.078
At most 2	0.429	72.876*	69.819	21.827	33.877
At most 3	0.395	51.050*	47.856	19.592	27.584
At most 4	0.307	31.457*	29.797	14.327	21.132
At most 5	0.224	17.131*	15.495	9.914	14.265
At most 6	0.169	7.217*	3.841	7.217*	3.841

Note: * denotes rejection of the hypothesis at the 0.05 level.

Source: Authors' computations using Eviews 10 (2023).

The Johansen cointegration test results reported in Table 6 indicate that from the Trace test, there exists six (6) cointegrating equations. The Maximum Eigenvalue

test also allows for the rejection of the hypothesis of no cointegration amongst the variables.

The Long Run FMOLS Estimation Result

The long run estimates of the relationship between institutional quality, government expenditure and money supply in Nigeria are presented in Table 7.

Table 7: The Long Run Regression Result (Fully Modified OLS)

Explanatory Variable	Dependent Variable is Log of Money Supply (lnMS)			
	Coefficient	Standard error	T-stat	Prob.
Log of Total Government Expenditure (lnTGE)	0.496	0.074	6.665***	0.000
Log of Civil Liberty (lnCL)	0.495	0.135	3.666***	0.001
Log of High-Powered Money (lnH)	0.483	0.069	6.975***	0.000
Monetary Policy Rate (MPR)	-0.019	0.006	-3.038***	0.005
Currency Ratio (CR)	-0.014	0.001	-11.10***	0.000
Liquidity Ratio (LR)	-0.002	0.001	-1.500	0.143
Constant (C)	1.482	0.252	5.880***	0.000
R-Squared	0.998			
Adjusted R-Squared	0.998			
Observations	40			

Note: *** denotes significance at the 0.01 level.

Source: Authors' computations using Eviews 10 (2023).

The coefficients of determination (R² and adjusted R²) of the FMOLS result show that 99.8% of the systematic variation in money supply is explained by the explanatory variables utilized in the model (Table 7), an indication of the goodness of fit of the model.

The results show a strong relationship between the explanatory variables (excluding liquidity ratio) and money supply. The empirical evidence indicates that the long run impact of total government expenditure and institutional quality on money supply is statistically significant at the 1 per cent significance level. Specifically, a percentage increase in total government expenditure engenders a 0.496% increase in money supply. Similarly, a one percent increase in institutional quality (CL) results in 0.495% decrease in money supply (given that increases in the value of CL indicates declining institutional quality (Freedom House, 2021)). These conform to the a-priori expectations. Our empirical evidence indicates that the impact of high-powered money on money supply in the long run, though positive and highly significant as expected. We find too, that the long-term impact of the monetary policy ratio and currency ratio variables, though negatively signed, contrary to expectation, was statistically significant. The liquidity ratio variable was not only negatively signed, contrary to expectation, it failed the test of statistical significance at all levels.

Table 8: Robustness Check (The OLS and DOLS results)

Explanatory Variable	Dependent Variable is Log of Money Supply (lnMS)			
	OLS		Dynamic OLS	
	Coefficient	T-statistic	Coefficient	T-statistic
Log of Total Government Expenditure (lnTGE)	0.475***	5.701	0.450**	2.320
Log of Civil Liberty (lnCL)	0.520***	3.553	0.695**	2.457
Log of High-Powered Money (lnH)	0.503***	6.433	0.528**	2.946
Monetary Policy Rate (MPR)	-0.0145**	-2.065	-0.030**	-2.862
Currency Ratio (CR)	-0.014***	-9.563	-0.014***	-7.662
Liquidity Ratio (LR)	-0.001	-0.697	-0.006	-1.533
Constant (C)	1.333***	5.242	1.515*	2.009
Diagnostics				
R-Squared	0.998		0.999	
Adjusted R-Squared	0.997		0.998	
F-statistics	2454.271***			
Serial Correlation LM Test				
Obs*R-squared (Prob. Chi-Squared (2))	3.132 (0.209)			
Observations	41		38	

Note: *** (**) and [*] denotes significance at the 0.01, 0.05 and 0.10 levels respectively.
Source: Authors' computations using Eviews 10 (2023).

The OLS and DOLS results for robustness checks of the baseline FMOLS model are presented in Table 8. The empirical results in the Table clearly confirm the FMOLS result that whereas a significantly positive relationship exists between total government expenditure and money supply, an inverse relationship exists between institutional quality and money supply in Nigeria.

The Short Run Dynamic Result (Error Correction Mechanism)

The short run dynamic relationship between institutional quality, total government expenditure and money supply is analyzed using the Error Correction Mechanism in Table 9.

Table 9: The Dynamic Short Run Regression Result (Fully Modified OLS)

Explanatory Variable	Dependent Variable is Log of Money Supply (lnMS)			
	Coefficient	Standard error	T-stat	Prob.
Δ Log of Total Government Expenditure (DlnTGE)	0.350	0.075	4.674***	0.000
Δ Log of Civil Liberty (DlnCL)	0.383	0.089	4.294***	0.000
Δ Log of High-Powered Money (DlnH)	0.389	0.056	6.896***	0.000
Δ Monetary Policy Rate (DMPR)	-0.010	0.004	-2.636**	0.013
Δ Currency Ratio (DCR)	-0.008	0.002	-5.209***	0.000
Δ Liquidity Ratio (DLR)	0.001	0.001	1.322	0.196
ECT (-1)	-0.554	0.100	-5.549***	0.000
Constant (C)	0.055	0.020	2.720**	0.011
R-Squared	0.535			
Adjusted R-Squared	0.427			
Observations	38			

Note: *** (**) and [*] denotes significance at the 0.01, 0.05 and 0.10 levels respectively. Δ is the difference operator.

Source: Authors' computations using Eviews 10 (2023).

From Table 9, the Error Correction term (ECT) has the correct sign and is statistically significant, indicating that about 51.4% of the disequilibrium in the model, in the current period, will be corrected in the next period.

The dynamic short run result is similar to the long run results. In the short run, total government expenditure is found to positively influence money supply while institutional quality inhibits same. Both variables passed the test of statistical significance at the 1 percent significance level. High-powered money also exerts a positive influence on money supply. Monetary policy rate and currency ratio exert negative influence on money supply while the impact of liquidity ratio is negative and insignificant

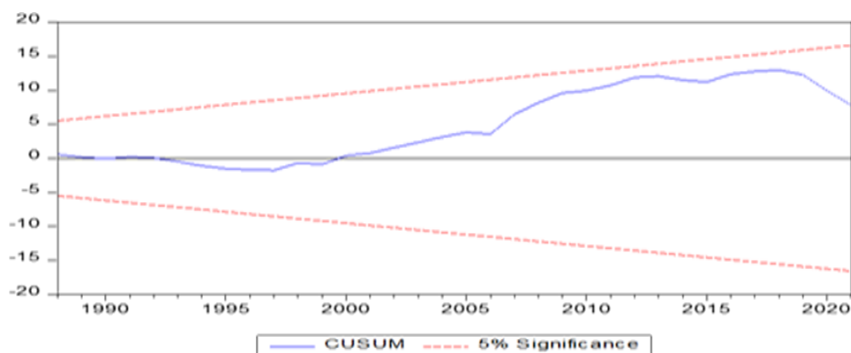


Figure 2: CUSUM test for structural stability
Source: Authors' (2023)

The CUSUM test for structural stability in Figure 2 reveals that the model for the study is stable and hence informative for policy formulation.

6. CONCLUSION

In this study, an attempt at empirically investigating the impacts of institutional quality and government expenditure on money supply is undertaken, informed partly by known recent studies on the endogeneity hypothesis of money supply, vis-a-vis the growing interests on the effects of macroeconomic and institutional determinants of money supply. The study employed the Fully Modified Ordinary Least Squares technique, using on times series data on the Nigerian economy, which covered the 1981 to 2021 sample period. We find that whereas total government expenditure positively impacted money supply within the reference period, improvements in institutional quality tends to reduce money supply in the country. The finding with respect to the institutional quality variable is understandable, given that improvements in quality of institutions is antithetical to corruption, a major factor in the undesirable phenomenon of unexplained injections of money into the economy. We find also that high powered money is the most significant positive determinant of money supply. The empirical evidence indicate that the monetary policy rate and cash reserve ratio variables exert negative but significant impacts while the impact of liquidity ratio on money supply is negative and insignificant. The empirical findings thus imply that government expenditure

directly influences money supply as both a monetary policy indicator and a monetary policy target variable, with the further implication that it is a potent tool for monetary expansion or contraction in Nigeria. Second, when institutional quality improves, monetary growth tends to decline, implying that weakness of institutions, manifesting, for example, by way of lack of independence of the monetary authority in the country could engender increases in the money supply, considered against the background of what manifests by way of the overbearing influence of politicians, with their rather insatiable appetite for monetary expansion, in prompting the monetary authority to expand money supply, even if doing so entails having to make resort to the mint.

In pursuance of discretionary monetary policy, it is pertinent for the monetary authorities, aside from the maneuvering of monetary policy instruments, to consider fiscal and institutional considerations in order to achieve their desired monetary policy targets. To this end, fiscal and monetary policy harmonization is inevitable for the attainment of broad monetary and macroeconomic objectives in Nigeria.

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