Impact of Monetary Policy on Poverty Reduction in Nigeria

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Abstract

This study examines the impact of monetary policy on poverty reduction in Nigeria between 1985 and 2019, taking into account other factors that influenced poverty. The institutional quality factors were included as part of independent variables to bridge the gap between monetary policy and poverty reduction in Nigeria. The study used Error Correction Model (ECM) technique for the estimation, and the results show that there exists a strong link between monetary policy and poverty reduction. The findings also reveal that institutional quality, proxy by political and economic institutions, is among the major factors that influence poverty in Nigeria. The study concludes that monetary authority should implement low inflationary monetary policy that will not only encourage investment, raise employment opportunities and economic growth, but also improves wellbeing of the people in the country.

Keywords: Monetary policy; Poverty; Institutions; Central Bank; Nigeria

JEL Classification Codes: E58, I32, B15, E58,

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1.0 Introduction
Poverty has been recognized as a major challenge to most countries around the globe, due to its consequential negative effects on the living standard of the affected individuals and the economy as a whole. According to Ayoo (2022), many developing countries are struggling with extreme poverty which is a critical challenge that needs urgent attention due to its adverse implications on the wellbeing of their citizens. Poverty is multidimensional in nature because it cuts across simultaneous deprivation of education, health, and standard of living. Global Multidimensional Poverty Index (MPI) (2020) describes poor people as those who are deprived of at least one-third of simultaneous deprivations of education, health, and living standards. Poverty is inability of people to obtain decent standard of living, such as ability to shop for food, clothes, housing, sanitation services, pipe-borne water, schooling, and access to education (OPHI, 2018, 2019, 2020).

Poverty is a global phenomenon because both developed and developing countries feel its presence. According to Global Multidimensional Poverty Index (2020), about 1.3 million people in developed countries live in abject poverty. This figure represents 22 percent of the population of these countries. The statistics also show that about 84.3 percent of the world multidimensional poverty is in sub-Saharan Africa and South Asia with over 1.09 billion people live in extreme poverty (Alkire and Jahan, 2019; OPHI, 2019). Omilola (2017) opined that many factors contributed to the increase in number of people living in extreme poverty in sub-Saharan Africa. Some of these factors include: globalization-related inequality, weak institutions, incessant violence, civil war, policy deficiencies, and consistent structural differences.

Nigeria is the most populous country in sub-Saharan African countries with over 200 million people (NBS 2021, estimate). The country is faced with many challenges in which poverty is predominant. The incidence of poverty rose from 40.2 percent to 53.3 percent between 1980 and 1985 (NBS, 2019). This period marked the beginning of the prevalent poverty rate in Nigeria. By 1996 and 2002, poverty rate grew significantly to 63.5 percent and 66.9 percent respectively. The rate fell to 54.43 percent and 45.5 percent in 2010 and 2017 respectively. The reduction in poverty rate in 2010 and 2017 was attributed to the significant deficit financing by the Central Bank of Nigeria as well as the development of monetary policy system to counter continued interest rate volatility. The population in poverty rose from 86.9 million in 2017 to 211 million in 2021. The increase in poverty level was attributed to the impact of COVID-19 crisis as well as growing population in the country (World Bank, 2020). The persistence poverty increase in Nigerian has been attributed to many factors which include: corruption in government; inadequate economic infrastructure; lack of access to quality education; high rate of unemployment; poor access to health care services among others.

The high rate of poverty level in Nigeria has led to a lot of social vices in the country such as banditry, kidnapping, hooliganism, ritual killing, and theft. Thus, there is need for drastic measures to effectively reduce poverty to the lowest level in all its ramifications, if not totally eradicated. In view of this, Nigeria government has made several efforts by adopting initiatives and policies with the aim of reducing and eradicating poverty in the country. For instance, National Poverty Eradication Programme (NAPEP) and National Poverty Eradication Council (NAP) were instituted during formal president Olusegun Obasanjo regime (Ijaiya *et al*., 2011; Gangas, 2017). The National Economic Empowerment and Development Strategy (NEEDS) was also introduced and implemented. These policies were aimed at: raising people's living standard, increasing the real income per capita, reducing unemployment, encouraging

indigenous involvement in productive activity, national reorientation and creating a strong environment for sustainable development. Unfortunately, these measures and policies could not produce the expected results as the poverty rate continues to rise.

However, the importance of monetary policy in poverty reduction cannot be over overemphasised because increase in money supply and decrease in interest rate could reduce poverty rate. This is because expansionary monetary policy directed to the productive sectors of the economy stimulates investment, which leads to increase output, create more employment, more income, hence poverty reduction. It is therefore, the objective of this study to examine the impact of monetary policy on poverty reduction in Nigeria.

The remainder of this study is organized as follows. Section 2 reviews theoretical and empirical literature that are relevant to this study. Section 3 presents methodology employed for the analysis. Section 4 presents and analyse empirical results, while Section 5 concludes the study based on the findings.

2.0 Literature Review

There are vast theories that directly or indirectly explain the link between monetary policy and poverty, through its impact on economic activities like prices, investment, growth, employment, income, and wellbeing of the citizens. For instance, in the classical theory of money, the features of the classical model are central to monetary theory because, it is where the monetary economics began (Lewis and Mizen, 2000). Classical approach to monetary covers the time period from 1790 to 1936, which makes it central in the sense that every subsequent contribution to monetary theory has resulted to either rejection or re-espousal of its assertion. However, the main stand of the classical economists on the effect of monetary policy on real sector is neutral directly or indirectly. This implies that increase in money supply will only lead to proportional increase in price level which leaves other economic variables unchanged, including employment and poverty. In contrast to classical view, the Keynesian money demand theorist observes that, as interest rate grows, more costs are incurred to keep money, and therefore, less money is used for idle balances; which leads to an increase in the poverty rate.

In the real balance effect approach, which centred on the Patinkin's reworking of the classical model, Patinkin (1965) argued that the classical model built on the foundations of the quantity theory, say's identity, and Walras' law was invalid and inconsistent. He further argued that an increase in the quantity of money will influence the demand for commodity, just like any other increase in wealth (Patinkin, 1965). He maintained that increase in demand as a result of increase in budget will lead to real balance effect on the part of individual by way of moving such individual from initial equilibrium to higher equilibrium, the position he called permanent.

On the link between monetary policy and poverty reduction, CBN (2011) opined that poverty reduction is among the main targets of the monetary policy. The implementation of monetary policy through transmission mechanism influences poverty level when instruments and operating targets are manipulated. For example, reduction in interest rate is expected to make the cost of borrowing affordable to the investors, which increases investment demand and output level. The increase in investment and output will lead to more income through employment opportunity and hence improve wellbeing of the people and reduce poverty. Gangas (2017) argued that although, an initial level of economic growth is unlikely to reduce poverty, but an increase in economic growth has tendency of reducing poverty. He argued

further that this process could be sustained if certain policies such as monetary policy were effectively implemented.

Pettinger (2019) identified four major policies that can be used by any government to reduce poverty. The first is to make provision for welfare benefits to the poorest in the society, which could be achieved through unemployment benefit to the unemployed in the society, income support, food stamps, and housing benefits. Second, is to regulate the labour market by given statutory reasonable minimum wages to workers. The third policy is direct provision of goods and services by providing subsidised housing, free education, and health care. The forth is to ensure free market policies that will promote economic growth towards improving living standard that will filter down to the poorest in the society. It could be deduced from the literature that an expansionary monetary policy lowers credit costs and increases investment. This raises successively the productivity and employment generation, and thereby leads to better welfare.

In order to ascertain the relevance of the above reviewed theories to the real world situation, many scholars have empirically investigated the determinants of poverty in various economies. For instance, Romer and Romer (1998) examined how monetary policy has short- and long-run implications on the well-being of the poor. The study showed that, the short-run relationship and the long-run relationship moving in opposite directions. The study, therefore, suggested that the short-run effects of monetary policy on poverty are fundamentally misguided, while expansionary policies can produce a boom and minimize poverty. Low inflation and steady overall growth in demand are linked to better welfare in the long-run for the poor. However, given that the cyclical impact of monetary policy is necessarily transient, the analysis shows that the most possible driver in continuously improving the conditions of the poor, is a monetary policy directed towards low inflation and steady aggregate demand.
Fouda-Ekobena (2014) investigated the impact of monetary policy on inequality and poverty using household income and consumption data for the period from 1986 to 2011. The findings show that positive correlation exist between interest rate and poverty in the United States, which implies that rising interest rate increases the poverty rate. He argued that this result may be different in the case of developing countries, based on the fact that these countries are characterized by different institutions, tax and benefit system.

An empirical investigation was carried out on the effectiveness of indirect monetary policy instruments in reducing poverty in Nigeria by Goshit and Lohgduut (2016) using time series data for the period 1986 to 2012. The study employed Ordinary Least Square technique to estimate the multiple regression model specified. The findings show that out of the monetary policy indicators used in the study, only money supply has significant impact on poverty rate. Other indicators like: banking sector's credit to the economy, interest rate, discount rate, reserve requirement, and liquidity ratio were not significant. The study concludes that instruments of indirect monetary policy alone were not adequate to reduce poverty in Nigeria. The study recommended that monetary policy should be used with other macroeconomic policies to fight poverty in Nigeria.

Ajisafe, *et al.* (2018) examined the link between financial inclusion and poverty reduction in Nigeria. The authors employed impulse response and variance decomposition technique and the results revealed a link between poverty reduction and financial inclusion. However, this relationship was less significant in understanding the disparities in consumption per capita, a variable used to proxy poverty reduction in the study. The results also revealed an inverse relationship between GDP and poverty reduction which is an indication that economic growth

experience did not lead to improved quality of life of the citizens. The study concluded that high-interest rates charged by deposit money banks hampered the SMEs in accessing loans and advances. This invariably serves as an impediment to poverty reduction, given the negative relationship between interest rate and poverty reduction.

In 2019, Tanjunk, et al. examined the impact of monetary policy and fiscal policy on poverty in Indonesia using data obtained from World Bank and Indonesian Central Bank for the period 1980 to 2017. The study employed Two-Step Error Correction Model and the results revealed that monetary policy proxy by interest rate has significant negative impact on poverty, while fiscal policy proxy by government expenditure was not significant in determining poverty in Indonesia during the period under investigation. The study recommended that monetary authority should lower interest on loan for micro-businessmen in order to reduce poverty as well as to keep inflation stable.

Saeed (2020) examined the effect of monetary policy on poverty alleviation in Pakistan for the period 2001 to 2017. Having sourced the data from World Bank Indicators and applied regression analysis, the results of the study revealed that neither money supply nor interest rate has significant impact on poverty. The author argued that increase in money supply will rather bring more inflation instead of reducing poverty.

Eke (2022) also examined the impact of monetary policies on living standards in Nigeria using data covering the period 1980 to 2017. The study employed eclectic regression techniques for the analysis and the results show that monetary policy, proxy with policy rate and money supply has positive influence on unemployment rate. The author concluded that monetary policies may accentuate unemployment and poverty in Nigeria. He recommended low policy rate and that money supply could be stopped through ways and means, so as to reduce poverty in the country. However, the existing body of the empirical studies on the impact of monetary policy on poverty provide varying evidences on the direction of relationship (Tanjunk, *et al.* 2019; Ajisafe, *et al.* 2018) as well as the level of the significant impact (Romer and Romer, 1998; Saeed, 2020; Eke, 2022). The difference in the evidence reported recon on the model specification, estimation method, country sample and time period. Therefore, this study investigates the impact of monetary policy and quality of institutions on poverty reduction in Nigeria.

3.0 Methodology
3.1 Model Specification
It can be deduced from the reviewed literature above that poverty is determined by many factors. In this study, some of these factors are grouped under control variables, quality of institutions, and monetary policy. Following Milton Friedman (1967) and Ajisafe *et al.* (2018), the functional link between poverty and its determinants can be expressed as:

$$pov = f(monetary\ policy, quality\ of\ institutions, control\ variables) \quad (3.1)$$

where: pov is poverty measured by the poverty headcount ratio at $1.90 a day (percent of the population), monetary policy is a vector of monetary variables (monetary policy rate, cash reserve ratio, liquidity ratio, and money supply), quality of institutions is a vector of political and economic institutions, and control variables are a vector of socioeconomic factors such as expected years of schooling, GDP per capita, inflation, and unemployment rates. Therefore, quation 3.1 can be expressed as:

$$pov = f(mpr, crr, lr, ms, exsch, inf, pci, ump, ins) \quad (3.2)$$

Expressing equation 3.2 in econometric form using the specifications given by Wooldridge (2005) and Greene (2003) yields:

$$\Delta pov_t = \sigma_0 + \beta_1 \Delta pov_{t-1} + \beta_2 \Delta mpr_t + \beta_3 \Delta crr_t + \beta_4 \Delta lr_t + \beta_5 \Delta ms_t + \beta_6 \Delta exsch_t +$$

$$\beta_7 \Delta inf_t + \beta_8 \Delta pci_t + \beta_9 \Delta ump_t + \beta_{10} \Delta ins_t + \lambda_1 ect_{t-1} + u_t \qquad (3.3)$$

Where: pov_t is Poverty headcount ratio at time t; mpr_t is Monetary Policy Rate at time t; crr_t is Cash Reserve Ratio at time t; lr_t is Liquidity Ratio at time t; ms_t is Log of Money Supply at time t; $exsch_t$ is expected years of schooling at time t; inf_t is Inflation Rate at time t; pci_t is GDP per capita growth rate at time t; ump_t is Unemployment Rate at time t, and ins_t is the Quality of Institution at time t. Δ is the difference of the variable, λ_1 is the speed of adjustment parameter, ect_{t-1} is the error correction term, and u_t is the stochastic disturbance. The σ is the constant, β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9 and β_{10} are the parameters to be estimated.

3.2 Data and Source
The study used annual data on all the variables from 1985 to 2019. The data were obtained from World Bank Database (2020), Central Bank of Nigeria (CBN) and Statistical Bulletin (2011 and 2020), Nigeria National Bureau of Statistics (2015), Worldwide Government Indicators (2020), the Oxford Poverty and Human Development Initiative (2019) and the Heritage Foundation Index (2020). The variables used include: poverty headcount ratio at $1.90 a day from WDI (2020) and NBS (2015), inflation and GDP per capita growth (measured in annual per cent) from WDI (2020), and unemployment rate from NBS (2015 & 2020), while monetary policy rate (formally known as minimum rediscount rates (measured in percent), cash reserve ratio, liquidity ratio (both measured in percent), and money supply (measured in ₦ Billion) from CBN (2020). The OPHI (2020) provides the expected years of education, while the WGI (2020) provides the political variable and the Heritage Foundation's Index of Economic Freedom provided the economic freedom index. The data for this study were analysed using the Error Correction Model (ECM), modelled after Wooldridge (2005) and Greene (2003) with little modifications, using STATA 12.

4.0 Presentation and Analysis of Results
4.1 Descriptive Statistics
Prior to conducting an empirical analysis of time series data, it is important to know the descriptive statistics of the data so as to overcome the problem associated with variable distribution and variability that can lead to spurious regression (Ajisafe, *et al,* 2018). Table 1 displays the descriptive statistics of the data used in this study. The table shows that the average proportion of the population that falls under the poverty headcount ratio (*pov*) was 55.9 percent, with a maximum value of 66.9 percent, a minimum value of 46.3 percent, and standard deviation of 5.1 percent.

The monetary policy rate variable (*mpr*) has a mean value of 13.66 percent with maximum and minimum values of 26 percent and 6 percent respectively, and a standard deviation of 3.83 percent. The table also revealed that the cash reserve ratio (*crr*) has average value of 9.26 percent, with maximum, minimum, and standard deviation values of 22.5, 1.0, and 6.71 percents respectively. The mean value of the liquidity ratio variable (*lr*) as revealed in Table 1 is 47.38 percent, with minimum, maximum, and standard values of 29.10, 75.83 and 10.57 percents respectively.

Table 1: Summary of the Descriptive Statistics

	Mean	Maximum	Minimum	Std. dev	Skewness	Kurtosis	Jarque-Bera	Obs
Pov	55.90	66.90	46.30	5.10	0.34	2.64	0.88	35
mpr	13.66	26.00	6.00	3.83	0.76	4.88	8.50***	35
Crr	9.26	22.50	1.00	6.71	0.82	2.63	4.09	35
Lr	47.38	75.83	29.10	10.57	0.52	3.19	1.63	35
Ms	7335.79	34251.70	22.30	10204.76	1.28	3.34	9.74***	35
exsch	8.27	10.00	6.70	1.27	0.14	1.47	3.54	35
Inf	19.32	72.84	5.38	17.93	1.70	4.53	20.25***	35
Cpi	1.76	12.46	-4.46	3.72	0.49	3.50	1.77	35
ump	11.45	23.10	1.90	6.70	-0.04	1.53	3.15	35

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Authors' computation (2022)

The average amount of money supplied (*ms*) into the economy is ₦7,335.79 billion, with a maximum value of ₦34,251.7 and a minimum value of ₦2.32 billion. The standard deviation of the average money supply is ₦10,204.76 billion. The expected years of schooling (*exsch*) averaged 8.27 years with maximum and minimum values of 10 and 6.7 years respectively. The standard deviation of the mean for expected school years is 1.27 for the period under study. The descriptive statistics also show that average inflation (*inf*) is 19.32 percent, with a maximum value of 72.84 percent, a minimum of 5.38 percent, and a standard deviation of 17.93 percent. The GDP per capita growth rate (*cpi*) is 1.76 percent at its average, while its maximum, minimum and standard deviation values are 12.46, -4.46 and 3.72 percents respectively. The average value of the unemployed is 11.45 percent, with a maximum value of 23.10 percent, a minimum value of 1.90 percent and a standard deviation of 6.7 percent. This analysis shows that the mean values for all the variables are within the maximum and minimum values at reasonable accuracy of the data series.

The descriptive statistics results in Table 1 also revealed that all the variables skewed to the right except unemployment variable which skewed to the left because it came out with negative sign. This indicates that all the variables have long right tail except unemployment variable. The results for kurtosis, as revealed in Table 1, show the degree of peakedness of each variable, which is generally measured in comparison to a normal distribution (Spiegel and Stephens, 2011). The decision rule is that: If the value of kurtosis is three, it means distribution is said to be mesokurtic (not peaked or flat-topped). If the value is above three, the distribution is said to be leptokurtic (relatively high peak), and if the value is below three, the distribution is said to be platykurtic (flat-topped). The results show that kurtosis value for monetary policy rate, liquidity ratio, money supply, and inflation variables is above three, thus the variables have high peak (leptokurtic) relative to the normal distribution, while poverty, cash reserve rate, expected years of schooling, and unemployment have flat-topped (platykurtic) distribution relative to the normal distribution since their kurtosis values are below three. The results for Jarque-Bera shows that: the poverty headcount, cash reserve ratio, liquidity ratio, expected years of schooling, GDP per capita, and the unemployment rate variables are normally distributed, while monetary policy rate, money supply, and inflation variables are not normally distributed. This implies that the poverty headcount, cash reserve ratio, liquidity ratio, expected years of schooling, GDP per capita, and unemployment rate variables having the tendencies to return to a normal distribution with an exception of other variables that are not normally distributed due to their significance p-value.

4.2. **Correlation Matrix**
Correlation techniques measure the degree of a linear relationship between two variables. This is necessary to rid the multicollinearity problem from the series in order to avoid spurious regression and unreliable results. Correlation statistics of 0.80 and above indicate that a strong linear relationship exist between two explanatory variables. When this occurs, one of the affected variables cannot be included as regressor in the model.

Table 2: Pairwise correlation

	pov	mpr	Crr	lr	ms	exsch	Inf	pci	ump
Poverty	1.00								
Monetary Policy Rate	0.26	1.00							
Cash Reserve Ratio	0.30	0.05	1.00						
Liquidity Ratio	0.31	0.10	0.44	1.00					
Money Supply	0.14	-0.25	0.79	0.29	1.00				
Education	0.18	-0.37	0.70	0.28	0.38	1.00			
Inflation	-0.09	0.39	-0.24	-0.35	-0.30	-0.44	1.00		
GDP Per Capita	0.04	-0.19	-0.20	0.05	-0.16	0.10	-0.35	1.00	
Unemployment	0.24	-0.34	0.58	0.37	0.74	0.84	-0.53	0.17	1.00

Source: Authors' computation (2022)

The results for Pairwise correlation is presented in Table 2, and since all the correlation coefficients are all below 0.8, the problem of multicollinearity is unlikely to be in the model specified in this study.

4.3. **Stationary Tests**
The stationarity nature of each of the variables used in this study were examined by conducting unit root test. This is because regression of data with non-stationary series could lead to a spurious result (Granger and Newbold, 1974; Nelson and Plosser, 1982). The study used Augmented Dickey-Fuller (1981) and Phillip–Perron (1988) tests to determine the order of integration of each variable in the specified model.

Table 3: The Result of Stationarity Tests

Test Type	Augmented Dickey-Fuller			Phillips-Perron		
Variable	Level (t-Stat)	1st Diff (t-Stat)	Decision	Level (t-Stat)	1st Diff (t-Stat)	Decision
Poverty	-2.035	-4.684***	I(1)	-2.159	-7.462***	I(1)
Monetary Policy Rate	-2.467	-5.853***	I(1)	-3.170**		I(0)
Cash Reserve Ratio	-1.870	-4.756***	I(1)	-2.172	-7.752***	I(1)
Liquidity Ratio	-3.134**		I(0)	--3.055**		I(0)
Money Supply	2.553	-3.859***	I(1)	2.926	-5.091***	I(1)
Education	-2.790	-4.249***	I(1)	-2.911	-6.699***	I(1)
Inflation	-3.513***		I(0)	-3.095**		I(0)
GDP Per Capita	-3.106**		I(0)	-4.183***		I(0)
Unemployment	-3.000	-5.406***	I(1)	-2.978	-5.969***	I(1)
		1 % level	-4.227			-4.227
Significant level		5 % level	-3.537			-3.537
		10 %level	-3.200			-3.200

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Authors' computation (2022)

The unit root test results for both Augmented Dickey-Fuller and Phillip–Perron tests were presented in Table 3. The results show that the variables are integrated of order zero and order one, which indicate that some of the variables are stationary at levels I(0) while others are stationary at first difference I(1). Thus, the ARDL Bound test can be used to test for the existence of long-run relationship between the dependent and independents variables.

4.4. Optimal Lags Selection

Table 4 shows the results for the lag length selection criteria. The results revealed that a maximum lag length of 2 is selected based on the criteria test statistics. Therefore, a maximum lag length of 2 would be used for the bounds test as well as subsequent estimations.

Table 4: The Lag Length Selection Criteria Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-768.4553	NA	2.35e+09	47.11850	47.52664	47.25583
1	-554.0871	298.8163	865872.5	39.03558	43.11696*	40.40884
2	-430.5394	104.8283*	233767.7*	36.45694*	44.21157	39.06613*

Source: Authors' computation (2022)

Note:* indicates lag order selected by the criterion; LR, FPE, AIC, SC, and HQ represent sequentially modified LR test statistic (each test at 5per cent level), Final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criterion

4.5. ARDL Bound Testing Co-integration Test Results

Table 5 presents the results for the bound test with unrestricted intercept and no trend. The F-statistics with the critical values of I(0) and I(1) were used to test for the presence of a long-run relationship between the series.

Table 5: Bound Test results (Unrestricted Intercept and No Trend)

Model	F-statistic	K	Pesaran *et al.* (2001) Critical Values At a 5per cent **Significance level**	
			Lower Bounds *I*(0)	**Upper Bounds *I*(1)**
1	4.055	8	2.22	3.39
2	5.991	9	2.14	3.30
3	4.397	9	2.14	3.30
4	4.423	9	2.14	3.30
5	4.663	9	2.14	3.30
6	4.153	9	2.14	3.30
7	20.942	9	2.14	3.30
8	5.546	9	2.14	3.30
9	5.484	9	2.14	3.30
10	3.795	9	2.14	3.30
11	6.795	9	2.14	3.30
12	4.117	9	2.14	3.30
13	4.584	9	2.14	3.30
14	5.433	9	2.14	3.30
15	8.454	9	2.14	3.30
16	8.183	9	2.14	3.30

Source: Authors' computation (2022)

Note: K is the number of variables minus 1

The ARDL Bound test results show that, the null hypothesis of no long-run relationship is rejected since the significance of the respective F-statistics is greater than the upper bound value I(1) of 3.30. The study seems to model a long-run relationship between poverty and its explanatory variables. The coefficients of long-run and short-run parameters were then estimated.

4.6 Estimation Analysis

The results for the regression model specified in this study are presented in Tables 6 and 7. In Table 6, regression results for seven (7) models were presented. Model 1 presents results for the main model while models (2 – 7) present results for the political institution indicators in stepwise. The lag error correction term (L.Poverty) results for all the models came out with expected signs and are statistically significant except for model 5. The significance of the error correction terms confirms the existence of stability and long-run relationship in the models. Each significant error correction term signals convergence in poverty and a raid move towards an equilibrium in the long-run. The results for determination coefficients (R^2) for each of the models indicate that at least 79.4 percent variations in poverty is demonstrated by joint explanatory variables included in the models. This shows that the models are in good fit and they have predictive power.

Monetary policy rate, one of the indicators of monetary policy variable, is relatively insignificant in all the models in the long-run as presented in Table 6. In the short-run, monetary policy rate has significant negative effect on poverty in model 3, while it was positive and significant at the current level and lagged period in model 7. In the short-run, the result indicates that an expansion in monetary policy rate by 1.03 and 1.23 units, contributes to the poverty rate. This result complies with the a priori assumption that a constant increase in the monetary policy rate will impede the access of funds to investments that may have influenced individual income invariably and, in exchange, improve individual well-being in the economy.

In the long-run, cash reserve ratio coefficients in models 3, 6, and 7 are positive and significant, matching the predictable relationship between their coefficients in the literature. The variable was negative and significant in the lagged period of the short run. With other indicators remaining constant in the short-run, a unit increase in cash reserves would also lead to a reduction in poverty. However, increasing the cash reserve unit will result in poverty increase in Nigeria in the long run. Thus, the cash reserve is one of the most stimulant drivers for long-run poverty reduction, though the impact also indicates high predictive power of increasing poverty in the short-run. As a result, as cash reserve ratio being influenced by the quality of institutions, people experience multidimensional poverty. If the monetary authorities do not reduce the cash reserve ratio, there would be inadequate funds for loans to private investors, which will have a long-run impact on the country's economic activities.

In the long-run, the liquidity ratio in Models 2, 7, 9, and 11 is positive and significant. A unit increase in the liquidity ratio, in turn, produces a unit increase in the poverty rate in Nigeria.

Table 6: Error Correction Model representation for main model and Political Institution

VARIABLES	Political Institution						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Poverty Model	Control of Corruption	Government Effectiveness	Political Stability Adjustment	Regulatory Quality	Rule of Law	Voice and Accountability
L.Poverty	-0.394***	-1.300***	-0.872***	-1.101***	-0.229	-1.014***	-1.724***
	(0.108)	(0.273)	(0.161)	(0.206)	(0.140)	(0.201)	(0.172)
				Long-run			
Monetary policy rate	0.376	0.195	0.300	-0.124	0.502	0.286	-0.150
	(0.357)	(0.308)	(0.207)	(0.318)	(0.644)	(0.174)	(0.0909)
Cash reserve ratio	0.438	0.428*	0.556***	0.304	1.568	0.567***	0.333**
	(0.351)	(0.169)	(0.139)	(0.223)	(1.124)	(0.155)	(0.0849)
Liquidity ratio	-0.169	0.249**	-0.206**	0.258	-0.502	-0.0374	0.474***
	(0.161)	(0.0685)	(0.0796)	(0.151)	(0.484)	(0.106)	(0.0615)
Money supply	6.237***	10.69***	11.41***	8.047***	8.618**	6.701***	8.771***
	(1.750)	(0.861)	(1.491)	(1.476)	(3.647)	(0.927)	(0.557)
Education	-9.740**	-18.89***	-18.50***	-7.826*	-17.15*	-9.116***	-15.52***
	(3.562)	(1.735)	(2.688)	(3.490)	(8.435)	(1.717)	(0.886)
Inflation	-0.190**	0.00664	-0.387***	0.142	-0.204	-0.216***	0.312***
	(0.0884)	(0.0534)	(0.0816)	(0.125)	(0.155)	(0.0653)	(0.0545)
GDP per capita	-0.879	-0.0422	-0.637**	0.397	-0.681	-0.903***	0.534**
	(0.530)	(0.137)	(0.280)	(0.297)	(0.822)	(0.256)	(0.146)
Unemployment	-0.494	-0.356*	-0.855***	-0.0420	-0.933	-0.585**	-0.695***
	(0.325)	(0.177)	(0.263)	(0.319)	(0.763)	(0.224)	(0.0888)
Control of Corruption		-7.704					
		(8.560)					
Government Effectiveness			41.80**				
			(15.18)				
Political stability				17.89**			
				(4.862)			
Regulatory quality					37.69		
					(39.20)		
Rule of law						-22.65***	
						(6.641)	
Voice and Accountability							10.41***
							(1.898)
				Short-run			
LD.Poverty	-0.125	0.443**	-0.265	0.408	-0.346**		0.882***
	(0.115)	(0.154)	(0.152)	(0.214)	(0.149)		(0.139)
D.Monetary policy rate		0.0332	-0.327**	0.385		-0.235	1.039***
		(0.297)	(0.147)	(0.375)		(0.148)	(0.203)
LD.Monetary policy rate		0.533*		0.502			1.225***
		(0.235)		(0.317)			(0.182)
D.Cash reserve ratio	0.213	0.133		-0.0330			-0.478**
	(0.131)	(0.292)		(0.273)			(0.165)
LD.Cash reserve ratio		-0.418*		-0.478*			-1.488***
		(0.184)		(0.202)			(0.177)
D.Liquidity ratio		-0.371***		-0.299*		-0.0612	-0.717***
		(0.0914)		(0.135)		(0.0815)	(0.0913)
LD.Liquidity ratio		-0.349***		-0.301**		-0.0793	-0.559***
		(0.0775)		(0.108)		(0.0590)	(0.0691)
D.Money supply	10.22**	-5.372		3.050	11.09***	13.25**	-18.30***
	(3.793)	(5.196)		(5.154)	(3.709)	(5.428)	(3.876)
LD.Money supply		-7.737		-3.980			-11.03**
		(6.951)		(5.604)			(3.303)
D.Education		12.23***	5.886**	4.671		3.320*	14.52***
		(3.000)	(1.990)	(2.812)		(1.783)	(1.722)

LD.Education		8.170** (2.028)	2.576 (1.565)	2.720 (1.869)			11.42*** (1.370)
D.Inflation		0.0467 (0.0378)	0.175*** (0.0456)	-0.0681 (0.0638)		0.0745 (0.0460)	-0.189*** (0.0393)
LD.Inflation		-0.0544 (0.0641)	0.159*** (0.0485)	-0.0922 (0.0924)		0.0702 (0.0467)	-0.227** (0.0519)
D.GDP per capita	0.731*** (0.130)	0.759*** (0.169)	1.008*** (0.212)	0.0677 (0.351)	0.571*** (0.117)	1.270*** (0.263)	-0.262 (0.202)
LD.GDP per capita			0.559** (0.200)	-0.420 (0.305)		0.467** (0.184)	-1.010*** (0.199)
D.Unemployment	0.177 (0.145)	0.677** (0.187)	0.643*** (0.195)	-0.147 (0.295)	0.162 (0.142)	0.573** (0.196)	1.089*** (0.169)
LD.Unemployment		0.411** (0.152)	0.433** (0.169)	-0.156 (0.220)		0.512** (0.181)	0.341* (0.128)
D.Control of corruption		16.42 (11.05)					
LD.Control of corruption		33.29** (8.265)					
D.Government effectiveness			-19.28** (8.461)				
D.Political stability				-17.63** (5.511)			
LD.Political stability				-7.147 (4.614)			
D.Voice and accountability							6.989 (4.045)
LD.Voice and accountability							9.179* (3.483)
Constant	37.83*** (11.64)	146.2*** (30.80)	162.5*** (34.69)	80.29* (28.94)	40.96*** (10.95)	58.68*** (16.95)	191.1*** (24.63)
Observations	35	35	35	35	35	35	35
R-squared	0.794	0.974	0.878	0.975	0.802	0.886	0.994

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This implies that, there is a close correlation between liquidity ratio and poverty in these models, which is contrary to a priori assumptions. In comparison, in short-run models 2, 4, 7, 9, 11, 13, 14, and 15, the variable has a negative influence and causal relationship with poverty. This means that, a unit increase in the liquidity ratio will consistently reduce multidimensional poverty, while keeping all other variables constant in the short-run. Increases in the funds immediately available for the discharge of financial obligations would improve employment, resulting in higher incomes and a decrease in the poverty rate. This corresponds to the a priori assumption and also in line with the findings of Goshit and Longduut (2016) that, the liquidity ratio in Nigeria is a primary determinant of poverty. As a result, the liquidity ratio represents a major stimulus in reducing multidimensional poverty in Nigeria.

The long-run effects of money supply on poverty are positive in all models. That is, if all factors remain constant, the elasticity of poverty to the money supply is all positive in the long run. It seems that, an increase in the amount of money supplied contributes to multidimensional poverty in the long run. Models 7, 11, and 14 show that, money supply is negative and significant in the short-run. These three coefficients are consistent with classical and monetarist theories, which hold that an increase or decrease in the supply of money can be relied on to stabilizes the economy and its effect on the poor. It is also consistent with the results of Goshit and Longduut (2016), Romer and Romer (1998), Ajisafe *et al.* (2018) and Eze (2022) who prove that increasing the money supply provides a transient boost to economic growth and poverty reduction.

The long-run effects of expected years of schooling on poverty are negative in all models, indicating that education has a long-run causal effect on poverty reduction in Nigeria. This means that an additional year of schooling reduces poverty rate in Nigeria on average. Expected years of schooling, in the short-run, is positive and significant in models 2, 3, 7, 9, 10, 11, 13, and 15. In the short-run, a year of improved education adds to multidimensional poverty in Nigeria. The basic idea is that, in the short-run, higher education exacerbates poverty, negatively affecting economic prosperity and people's well-being.

In addition, the regression results also indicate that inflation has a positive and long-run causal effect on poverty in Nigeria, as demonstrated in Model 7, and in the short-run in Models 3, 8 and 10. The high rate of inflation has a direct impact on short-run poverty and is consistent with the a priori expectation and monetary theory that, expansionary monetary policy has a lasting or probable effect on the incidence of poverty. This will occur as a result of a gradual increase in the general price level, which reduces economic purchasing power, lowering the living standard of the poor, and increased poverty incidence in the country. However, the long-run coefficients of Models 1, 3, 6, and 10, as well as the short-run coefficients of Models 7 and 14, have shown a significant and negative relationship between inflation and poverty. This means that, a unit increase in inflation reduces poverty in Nigeria on average. This result contradicts the a priori expectation of positive relationship between inflation and poverty. However, the result is positive in model 7 in the long-run and models 8, and 10 in the short-run. This implies that higher inflation rates exacerbate poverty, as a result of decrease in economic growth and people's well-being.

Table 7: Error Correction Model representation for Economic Institution

VARIABLES	Economic Institution								
	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Overall Score	Property Rights	Govern-ment Integrity	Tax Burden	Business Freedom	Labour Freedom	Monetary Freedom	Trade Freedom	Investment Freedom
Adjustment									
L.Poverty	-0.298*	-1.606***	-1.019***	-1.575***	-0.807***	-1.105***	-0.553*	-1.332**	-1.210***
	(0.146)	(0.343)	(0.201)	(0.236)	(0.210)	(0.230)	(0.228)	(0.376)	(0.179)
Long-run									
Monetary policy rate	-0.460	-0.121	0.273	0.429*	-0.302	-0.0496	-0.239	-0.141	0.000394
	(0.596)	(0.182)	(0.212)	(0.166)	(0.424)	(0.289)	(0.553)	(0.163)	(0.176)
Cash reserve ratio	1.105*	0.734***	0.686***	0.265*	1.641***	0.321	0.921**	0.498**	0.265*
	(0.545)	(0.135)	(0.206)	(0.117)	(0.399)	(0.203)	(0.356)	(0.140)	(0.133)
Liquidity ratio	-0.359	0.355**	-0.292**	0.266**	-0.191	0.138	0.555	0.0646	0.0804
	(0.351)	(0.100)	(0.124)	(0.0925)	(0.114)	(0.0871)	(0.285)	(0.0636)	(0.0767)
Money supply	8.191**	10.21***	8.545***	6.831***	11.25***	9.683***	9.985***	8.977***	5.646***
	(3.230)	(0.774)	(1.535)	(0.912)	(1.646)	(1.235)	(1.919)	(0.780)	(0.872)
Education	-12.64**	-17.36***	-15.56***	-12.07***	-20.50***	-16.21***	-16.75***	-12.37***	-7.039**
	(4.834)	(1.654)	(2.963)	(1.532)	(3.783)	(2.639)	(3.764)	(1.645)	(2.035)
Inflation	-0.385	0.104	-0.325***	0.130	-0.143	-0.0294	0.701	-0.0696	0.0445
	(0.226)	(0.0790)	(0.0800)	(0.0796)	(0.0868)	(0.0432)	(0.388)	(0.0455)	(0.0341)
GDP per capita	-0.411	0.365	-0.931**	-0.0169	-0.491	-0.154	1.527	-0.0213	0.0202
	(0.677)	(0.226)	(0.330)	(0.171)	(0.340)	(0.200)	(0.835)	(0.150)	(0.160)
Unemployment	-3.196	-1.159***	-1.148***	-0.418*	-0.632*	-0.319	-0.0363	-0.772**	-0.191
	(1.841)	(0.139)	(0.282)	(0.177)	(0.304)	(0.199)	(0.996)	(0.231)	(0.104)
Overall score	2.935								
	(2.441)								
Property rights		-0.284							
		(0.141)							
Government integrity			-0.255**						
			(0.0984)						
Tax burden				0.901**					
				(0.236)					
Business freedom					2.341*				
					(1.129)				
Labour freedom						-0.498**			
						(0.187)			
Monetary freedom							0.00489		
							(0.419)		
Trade freedom								-0.368**	
								(0.0936)	
Investment freedom									0.345***
									(0.0492)
Short-run									
LD.Poverty	-0.213	0.724*		0.699**		0.151	0.720**	0.327	0.342*
	(0.128)	(0.275)		(0.219)		(0.151)	(0.211)	(0.192)	(0.153)
D.Monetary policy rate		0.523	-0.351*	-0.00519	0.234	0.243	0.450	0.173	0.0646
		(0.356)	(0.167)	(0.287)	(0.286)	(0.280)	(0.389)	(0.209)	(0.177)
LD.Monetary policy rate		0.802*		0.425	0.227	0.371	0.589	0.315	0.151
		(0.326)		(0.263)	(0.205)	(0.218)	(0.303)	(0.220)	(0.134)
D.Cash reserve ratio		-0.632	-0.108	-0.0936	-0.829	-0.0509	0.121	-0.255	-0.173
		(0.298)	(0.233)	(0.198)	(0.446)	(0.290)	(0.233)	(0.184)	(0.169)
LD.Cash reserve ratio		-1.084**	-0.212	-0.955**	-0.566**	-0.461**	-0.794**	-0.336**	-0.447**
		(0.268)	(0.159)	(0.214)	(0.204)	(0.172)	(0.221)	(0.121)	(0.144)
D.Liquidity ratio		-0.429*	0.105	-0.489**		-0.205*	-0.283*	-0.140	-0.162*
		(0.156)	(0.0803)	(0.135)		(0.0951)	(0.122)	(0.0847)	(0.0759)
LD.Liquidity ratio		-0.358**		-0.382**		-0.160**	-0.387**	-0.127	-0.164**
		(0.124)		(0.106)		(0.0693)	(0.0982)	(0.0696)	(0.0512)
D.Money supply	18.88***	-19.21*		-5.905	13.35**		4.904	-1.521	7.094*
	(5.673)	(8.136)		(4.518)	(5.164)		(5.982)	(6.158)	(3.504)
LD.Money supply	-5.903	-11.72		-16.74**	-9.230		-15.45**	-7.282	
	(5.055)	(6.057)		(5.523)	(6.863)		(4.811)	(4.169)	

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D.Education		15.08** (4.377)	7.426** (2.940)	11.93** (2.626)	6.910* (3.518)	9.448** (3.594)	5.895* (2.342)	9.004** (2.823)	3.986* (1.828)
LD.Education		6.457* (2.335)	5.674** (2.130)	8.156** (1.863)	4.650 (3.023)	5.567** (2.412)	4.616** (1.696)	3.842 (2.000)	1.678 (1.390)
D.Inflation	0.0115 (0.0419)	0.0418 (0.0557)	0.165** (0.0554)	-0.0851 (0.0577)	0.0497 (0.0444)		-0.196** (0.0675)	0.0764* (0.0362)	-0.0543 (0.0291)
LD.Inflation	0.101** (0.0457)	-0.0520 (0.0877)	0.150** (0.0614)	-0.0504 (0.0846)	0.120* (0.0555)		-0.204* (0.0948)	0.0648 (0.0572)	
D.GDP per capita	0.519*** (0.129)	0.0937 (0.315)	1.372*** (0.304)	0.609* (0.249)	0.808*** (0.201)	0.648*** (0.184)	-0.0733 (0.319)	0.420** (0.162)	0.347 (0.194)
LD.GDP per capita		-0.546 (0.308)	0.608** (0.227)	-0.435 (0.269)			-0.910** (0.322)		-0.191 (0.157)
D.Unemployment	0.454** (0.195)	1.959** (0.501)	0.449 (0.298)	0.497 (0.235)	0.315 (0.179)	0.416* (0.211)	0.194 (0.409)	0.982*** (0.195)	0.180 (0.122)
LD.Unemployment	0.388** (0.173)	1.012* (0.441)	0.337 (0.197)	0.429** (0.153)	0.235 (0.172)	0.242 (0.189)	0.202 (0.245)	0.710*** (0.163)	
D.Overall score	-0.775** (0.307)								
LD.Overall score	-1.048*** (0.335)								
D.Property rights		0.00929 (0.320)							
LD.Property rights		-0.541** (0.172)							
D.Government integrity			0.318** (0.112)						
LD.Government integrity			0.0994 (0.105)						
D.Tax burden				-0.574 (0.601)					
LD.Tax burden				0.869 (0.527)					
D.Business freedom					-1.478* (0.679)				
LD.Business freedom					-1.106** (0.414)				
D.Labour freedom						0.366 (0.206)			
LD.Labour freedom						0.329* (0.150)			
D.Monetary freedom							0.572* (0.232)		
D.Trade freedom								0.0976 (0.191)	
LD.Trade freedom								-0.133 (0.146)	
D.Investment freedom									-0.303*** (0.0693)
LD.Investment freedom									-0.165** (0.0565)
Constant	0.00152 (28.96)	206.2** (59.62)	157.8*** (35.44)	26.15 (35.78)	20.53 (55.84)	168.4*** (46.65)	42.43 (25.49)	156.7** (44.39)	61.24** (18.09)
Observations	35	35	35	35	35	35	35	35	35
R-squared	0.880	0.977	0.911	0.981	0.920	0.907	0.978	0.979	0.969

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' computation (2022)

The long-run coefficients of GDP per capita appear with negative signs in models 3, 6 and 10, and in short-run models 7 and 14. These results meet the a priori expectations, which means that the rate of poverty in Nigeria decreases with each unit increase in per capita income.

In contrast, GDP per capita income has positive significant coefficients in the long-run models 1. 2, 3, 5 and 6, and in the short-run models 8, 10, 12 and 13. The short-run per capita income coefficients do not adhere to the monetary and neoclassical hypothesis that increasing individual incomes should be the primary concern in lowering the poverty rate and which would allow the poor to have access to funds and services.

The results also revealed negative and significant relationship between unemployment variable and poverty rate in Nigeria as shown in most of the long-run models which contradicts the a priori expectations. In the short-run, the results revealed positive and significant effect of unemployment rate on poverty rate. This means that an increase in unemployment rate will lead to increase in poverty rate in Nigeria. This result is consistent with the a priori assumption and also in line with the findings of Goshit and Longduut (2016) and Fouda-Ekobena (2014).

The results for the political institution indicators are presented in Table 6. In the long-run, four out of the six indicators were statistically significant. While rule of law indicator has negative impact on poverty, governance effectiveness, political stability, and voice and accountability have positive impact on poverty in Nigeria. In the short-run, the results revealed that poverty declines as government effectiveness and political stability improve. This shows that institutional framework is an important factor in eradicating poverty in the country. The economic institution indicators results are presented in Table 7. The results revealed that in the long-run, government integrity, labour freedom, and trade freedom were negative and statistically significant. This implies that improvement in government integrity, labour freedom, and trade freedom, would lead to reduction in poverty in Nigeria.

Tax burden and investment freedom coefficients are both positive and significant in the long run. This implies that poverty is affected by tax burden and investment freedom in the country. Moreover, the overall scores of economic freedom, property rights, market freedom and investment freedom reveal a causal inverse relationship with poverty in the short run. These results are in line with the Solow model, which state that the best way to avoid poverty trap is by improving institutions. The result also corroborates with the predicted results from Tebaldi and Mohan (2008) and Deolalikar, *et al.* (2011), who found the quality of institutions to be inversely linked to poverty. It can be inferred from the results that economic framework is a key factor in reducing poverty in Nigeria.

5.0 Conclusion and Recommendations
This study has empirically examined the impact of monetary policy on poverty rate in Nigeria with the primary aim of identifying those monetary policy indicators that are important for poverty reduction in the country. Among the four indicators of monetary policy used in this study, monetary policy rate was the only indicator that does not have significant influence on poverty rate. There exist strong link between other three indicators (money supply, cash reserve, and liquidity ratio) and poverty rate. The study also revealed a strong link between institutional quality and poverty rate in Nigeria. Based on the empirical results of this study, it can be concluded that monetary policy and institutional quality are major factors that influenced poverty rate in Nigeria during the period under investigation. It is therefore, suggested that monetary authorities should pursue a program of low-inflation monetary policy that will stabilize demand and boost the status of the underprivileged, by focussing the

productive sectors of the economy that involves small and medium-sized businesses. With improved institutional quality, low-inflation monetary policy will not only encourage investment, raise employment opportunity, economic growth, but also improves well-being of the people in the country.

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