



Yaji, Williams Nyijime  
 Department of Economics,  
 Faculty of Social Sciences  
 Federal University of Lafia  
[williams.yaji@socsci.fulafia.edu.ng](mailto:williams.yaji@socsci.fulafia.edu.ng)

## MONETARY POLICY AND INCOME INEQUALITY IN NIGERIA: NEW INSIGHTS FROM ARDL MODELLING

### ABSTRACT

*This study examines the effect of monetary policy on income inequality in Nigeria from 1986 to 2021 using annual time-series data from the World Bank World Development Indicators. Income inequality is proxied by the Gini index, while monetary policy is captured through exchange rate, real interest rate, and inflation rate, with GDP per capita and unemployment included as control variables. The study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach, supported by Augmented Dickey-Fuller unit root tests and Granger causality analysis. The unit root results show a mixed order of integration,  $I(0)$  and  $I(1)$ , validating the ARDL framework. The bounds test confirms a long-run relationship among the variables. The long-run estimates indicate that exchange rate and GDP per capita have negative and statistically significant effects on income inequality, whereas inflation, real interest rate, and unemployment are statistically insignificant. In the short run, exchange rate and GDP per capita remain significant, while the error correction term is negative and significant, showing that about 22.4 per cent of disequilibrium is corrected annually. The Granger causality results reveal unidirectional causality from exchange rate to income inequality and from income inequality to GDP per capita. The findings identify exchange rate dynamics as the dominant monetary policy channel associated with income inequality in Nigeria. The study recommends more coherent exchange rate management, stronger domestic productive capacity, and better coordination between monetary, fiscal, and industrial policies to reduce the distributional effects of macroeconomic instability.*

**Keywords:** Monetary policy; income inequality; exchange rate; ARDL; Gini index; Nigeria

**JEL Classification :** E52; D63; C32; O55

### 1. Introduction

Monetary policy remains one of the principal macroeconomic instruments through which governments and central banks pursue price stability, output growth, employment, exchange rate stability, and broader macroeconomic balance. In conventional macroeconomic management, monetary policy regulates the value, supply, availability, and cost of money and credit in order to achieve predetermined policy objectives (CBN, 1997, 2006; Ifurueze, 2022).

**\*Corresponding Author:**  
 Yaji, Williams Nyijime  
 Department of Economics,  
 Faculty of Social Sciences  
 Federal University of Lafia  
[williams.yaji@socsci.fulafia.edu.ng](mailto:williams.yaji@socsci.fulafia.edu.ng)

In developing economies, however, the consequences of monetary policy extend beyond aggregate indicators such as inflation, interest rates, and output. Monetary policy decisions may also affect income distribution through employment, credit access, inflation, asset prices, exchange rate movements, and household purchasing power.

The relationship between monetary policy and income inequality has therefore become an important empirical issue. Monetary expansion may reduce inequality when it stimulates employment and raises labour income among lower-income households. Conversely, it may worsen inequality when the benefits of asset-price appreciation accrue mainly to wealthier households (Coibion et al., 2012, 2017; Montecino & Epstein, 2015). Similarly, contractionary monetary policy may worsen inequality by increasing unemployment and restricting credit access, although it may protect poorer households from the regressive effects of inflation. These competing transmission channels mean that the monetary policy-inequality relationship is theoretically ambiguous and empirically context-specific.

Income inequality itself has become a major policy problem in both developed and developing economies. Osberg (2015) defines income inequality as the unequal distribution of income and opportunity across groups in society, while Milanovic (2016) treats inequality as a broader condition of unequal distribution among identifiable social or economic units. In Nigeria, the problem is especially severe because economic growth has not consistently translated into broad-based welfare improvement. Mayah, Mariotti, Mere, and Odo (2017) argue that Nigeria's income inequality remains extreme despite the country's status as one of Africa's largest economies.

Nigeria provides a relevant case for examining this relationship. Since the Structural Adjustment Programme of 1986, the country has experienced exchange rate liberalisation, banking-sector reforms, inflation-control efforts, monetary tightening episodes, and several interventions aimed at stabilising the domestic currency. Yet income inequality has persisted. This raises a direct empirical question: have monetary policy variables contributed to the behaviour of income inequality in Nigeria, and if so, through which channel?

The exchange rate channel is particularly important in Nigeria. The economy is heavily dependent on imported consumer goods, intermediate inputs, and foreign exchange earnings from crude oil. Exchange rate depreciation can therefore transmit quickly into domestic prices and household welfare. Since poorer households spend a larger proportion of income on consumption, exchange rate instability can have distributional consequences. This makes exchange rate dynamics a plausible monetary policy channel through which inequality is affected in Nigeria.

Although studies such as Coibion et al. (2012, 2017), Furceri, Loungani, and Zdzienicka (2016), Saiki and Frost (2014), and Hohberger, Priftis, and Vogel (2019, 2020) have examined monetary policy and inequality in advanced economies, evidence on Nigeria remains comparatively thin. Nigerian studies have more often focused on monetary policy and growth, inflation, financial-sector performance, or macroeconomic stability (Chuku, 2009; Ifurueze, 2022), while fewer have treated income inequality as the central outcome. Tolulope (2021) is one relevant Nigerian contribution, but further country-specific evidence is still required.

The broad objective of this study is therefore to examine the empirical relationship between monetary policy and income inequality in Nigeria. Specifically, the study seeks to determine whether a long-run relationship exists between monetary policy and income inequality, estimate the effect of monetary policy variables on inequality, and establish the direction of causality among the variables. The study uses annual time-series data from 1986 to 2021 and applies the Autoregressive Distributed Lag (ARDL) bounds testing framework.

The rest of the paper is organised as follows. Section 2 reviews the conceptual, theoretical, and empirical literature. Section 3 presents the methodology. Section 4 discusses the empirical results. Section 5 concludes the study and offers policy recommendations.

## **Literature Review**

### **2.1 Conceptual Issues**

#### **2.1.1 Monetary Policy**

Monetary policy refers to the deliberate actions undertaken by the monetary authority to regulate the supply, cost, and availability of money and credit in an economy. The Central Bank of Nigeria defines monetary policy as policy measures designed to regulate the supply and cost of credit in line with expected levels of economic activity (CBN, 1997, 2006). Similarly, Chimezie (2012) describes monetary policy as the conscious action of monetary authorities to influence the quantity, availability, or cost of money in pursuit of macroeconomic objectives. Ifurueze (2022) also emphasises that monetary policy is designed to regulate money supply and credit conditions in order to achieve price stability, growth, and broader economic stability. In Nigeria, monetary policy is primarily conducted by the Central Bank of Nigeria through instruments such as the monetary policy rate, liquidity management, cash reserve requirements, open market operations, and exchange rate interventions. The transmission of monetary policy occurs through several channels, including interest rates, credit availability, exchange rates, inflation, asset prices, and expectations. These channels influence aggregate demand, investment, consumption, prices, and income distribution.

#### **2.1.2 Income Inequality**

Income inequality refers to the unequal distribution of income among individuals or households within an economy. Barro (2000) links inequality to unequal status, rights, and opportunities, while Osberg (2015) defines income inequality as the unequal distribution of income and opportunity across groups in society. Neves, Afonso, and Silva (2016) describe it as the unequal distribution of income and assets across a population. In empirical research, income inequality is commonly measured using the Gini index. The Gini index ranges from 0 to 100, where 0 represents perfect equality and 100 represents perfect inequality. Tridico (2018) notes that the Gini coefficient remains one of the most widely used measures of income inequality because it captures the overall distribution of income. Following this convention, the present study adopts the Gini index as the measure of income inequality in Nigeria.

### 2.1.3 Monetary Policy and Inequality

The link between monetary policy and income inequality is complex because monetary policy affects households through multiple channels. Amaral (2017) identifies the inflation-tax channel, savings redistribution channel, interest-rate exposure channel, earnings heterogeneity channel, and income-composition channel as important mechanisms through which monetary policy may influence inequality. The inflation-tax channel suggests that inflation disproportionately affects lower-income households because they hold a larger proportion of their wealth in cash and spend more of their income on basic consumption. Erosa and Ventura (2002) argue that inflation can operate as a regressive consumption tax. The savings redistribution channel suggests that unexpected inflation redistributes wealth between borrowers and lenders. The interest-rate exposure channel focuses on how changes in real interest rates affect households differently depending on the maturity and composition of their assets and liabilities (Auclert, 2016).

The earnings heterogeneity channel is particularly relevant for developing economies. Monetary policy affects employment, wages, and output, but these effects are not evenly distributed across households. Heathcote, Perri, and Violante (2009) show that different parts of the earnings distribution respond differently to labour-market changes, while Carpenter and Rodgers (2004) find that tighter monetary policy can disproportionately affect less-skilled and minority workers through unemployment effects. In Nigeria, where unemployment, informality, inflation, and exchange rate instability are major macroeconomic concerns, these channels are likely to matter.

## 2.2 Theoretical Framework

This study is anchored on monetary transmission theory, drawing from the classical, Keynesian, and monetarist perspectives of monetary policy. The classical view is rooted in the quantity theory of money associated with Fisher (1911). The theory is commonly expressed as  $MV = PY$ , where  $M$  denotes money supply,  $V$  is velocity,  $P$  is the price level, and  $Y$  is real output. Classical theory assumes that velocity and output are relatively stable, implying that changes in money supply primarily affect prices. From this perspective, excessive monetary expansion can generate inflation, which may affect inequality through the inflation-tax channel. The Keynesian view challenges the classical assumption that money affects only prices. Keynesian theory argues that monetary policy affects real economic activity through interest rates, investment, aggregate demand, employment, and income. When monetary expansion lowers interest rates, investment and consumption may rise, increasing output and employment. This makes the Keynesian framework relevant for inequality analysis because employment and wage effects are distributional rather than merely aggregate.

The monetarist view, associated with Friedman (1963), emphasises the importance of money supply in macroeconomic stability. Monetarists accept that monetary policy may affect output in the short run but argue that in the long run excessive monetary growth primarily produces inflation. This is relevant to inequality because persistent inflation may reduce real income and purchasing power, especially among households with limited access to inflation-hedging assets. This paper adopts monetary transmission theory because it explains how monetary policy variables such as exchange rate, interest rate, and

inflation may affect income inequality. The framework is suitable for Nigeria because the economy is exposed to exchange rate volatility, inflationary pressure, unemployment, and weak productive capacity.

### 2.3 Empirical Review

Empirical evidence on monetary policy and inequality is mixed. This is not surprising because the direction of the effect depends on the dominant transmission channel, the structure of household income, labour-market conditions, asset ownership, and the macroeconomic environment. The literature may be grouped into studies that find inequality-increasing effects, studies that find inequality-reducing effects, and studies that report conditional or ambiguous effects.

Early and influential evidence comes from Coibion et al. (2012), who investigated the effects of monetary policy shocks on consumption and income inequality in the United States. Using household-level data and monetary policy shocks identified by Romer and Romer, the study found that contractionary monetary policy shocks significantly increase income, consumption, and wage inequality. In a later journal version, Coibion et al. (2017) confirmed that monetary policy shocks have meaningful distributional consequences in the United States. These findings imply that tighter monetary policy can worsen inequality through labour-market and income-composition channels.

In a broader cross-country study, Furceri et al. (2016) examined the effects of monetary policy shocks on inequality across advanced and emerging economies. Their results indicate that contractionary monetary policy shocks tend to increase inequality, especially where financial markets and labour-market institutions amplify distributional effects. Aye, Clance, and Gupta (2019) also found that monetary and fiscal policy shocks affect inequality in the United States, with the magnitude of the effect depending on uncertainty conditions. These studies collectively suggest that restrictive monetary policy can have regressive consequences.

However, the literature does not produce a uniform conclusion. Saiki and Frost (2014) examined Japan and found that unconventional monetary policy may increase inequality, particularly through asset-price effects. Their later work, Saiki and Frost (2020), further questioned whether Japan's experience is unique, showing that monetary policy can affect inequality differently depending on household asset ownership and financial-market structure. This evidence is important because it shows that expansionary monetary policy is not automatically equalising; where asset ownership is concentrated among richer households, monetary easing may widen inequality.

Evidence from Europe is also mixed. Hohberger et al. (2019) found that quantitative easing in the euro area had important macroeconomic effects, while Hohberger et al. (2020) examined the distributional effects of conventional monetary policy and quantitative easing using an estimated DSGE model. Their findings suggest that monetary policy can affect inequality through both labour-income and asset-price channels. Vivien (2021), using a panel ARDL approach for European economies, found that the effect of monetary policy on inequality is modest but not negligible. The study reported that unemployment and long-term interest rates can worsen inequality, while GDP per capita may reduce it.

The Japanese literature further illustrates the importance of country-specific conditions. Inui, Sudo, and Yamada (2017) examined the effects of monetary policy shocks on inequality in Japan and reported that the relationship is not stable across all measures of inequality. Feldkircher and Kakamu (2022), using grouped Japanese data, also showed that monetary policy affects income inequality, but the strength and direction of the effect vary depending on the income group and policy channel examined. These findings reinforce the need for country-specific investigation rather than assuming a universal relationship.

Studies on monetary systems and broader distributional outcomes also support the view that monetary arrangements matter for inequality. Othman, Alhabshi, Kassim, Abdullah, and Haron (2020) examined cryptocurrencies, fiat money, and the gold standard in relation to income and wealth distribution. Their findings suggest that monetary systems can have significant implications for inequality. Although their focus differs from the present study, their evidence strengthens the argument that monetary structures and policy regimes are not distributionally neutral.

For Nigeria, Tolulope (2021) examined monetary policy shocks and income inequality, distinguishing between anticipated and unanticipated shocks. The study found that both anticipated and unanticipated monetary policy shocks reduce income inequality in Nigeria. This finding differs from much of the evidence from advanced economies and shows that the Nigerian case may be shaped by distinctive transmission mechanisms. Chuku (2009), although focused on monetary policy innovations rather than inequality, provides useful Nigerian evidence on the macroeconomic effects of monetary policy shocks using a structural VAR approach. Ifurueze (2022) also examined monetary policy instruments and financial-sector performance in Nigeria and found evidence of long-run relationships between monetary policy instruments and financial-sector outcomes.

The Nigerian evidence therefore remains incomplete. Some studies focus on monetary policy and macroeconomic performance, while others focus on inequality without fully modelling monetary policy channels. Moreover, relatively few Nigerian studies place exchange rate, inflation, interest rate, GDP per capita, unemployment, and income inequality within a single ARDL framework. This study addresses that gap by examining monetary policy and income inequality in Nigeria from 1986 to 2021 using ARDL bounds testing and Granger causality analysis.

The foregoing literature review shows that the monetary policy-inequality relationship is unresolved. Coibion et al. (2012, 2017), Furceri et al. (2016), and Aye et al. (2019) suggest that contractionary monetary policy can increase inequality. In contrast, Saiki and Frost (2014, 2020), Hohberger et al. (2020), and Vivien (2021) show that the effect may differ depending on asset ownership, employment response, inflation, and country-specific macroeconomic structure. Nigerian evidence, including Tolulope (2021), remains limited and does not fully settle the issue.

The gap is therefore both empirical and contextual. Empirically, there is a need for further time-series evidence on Nigeria using methods suitable for variables with mixed orders of integration. Contextually, Nigeria's import dependence, exchange rate volatility, inflationary pressure, unemployment, and weak productive base mean that the exchange rate channel may play a more important role than in many advanced economies. This study fills this gap by estimating the long-run, short-run, and causal

relationship between monetary policy variables and income inequality in Nigeria using the ARDL framework.

### 3. Data, Model, and Estimation Strategy

#### 3.1 Data and Variable Definition

This paper uses annual Nigerian time-series data covering 1986 to 2021. The starting point is chosen to capture the post-Structural Adjustment Programme period, during which Nigeria experienced major exchange rate, monetary, and financial-sector reforms. The data are obtained from the World Bank World Development Indicators. The dependent variable is income inequality, measured by the Gini index (GINI). Monetary policy is represented by three variables: the official exchange rate (EXR), real interest rate (INTR), and inflation rate (INFR). Two macroeconomic controls are included: GDP per capita (GDPPC) and unemployment rate (UNEMP). The inclusion of GDP per capita controls for the distributional relevance of income growth, while unemployment captures labour-market conditions that may affect the lower tail of the income distribution.

#### 3.2 Empirical Specification

The baseline empirical relationship is specified as:

$$\text{GINI}_t = +\beta_0 + \beta_1 \text{EXR}_t + \beta_2 \text{INTR}_t + \beta_3 \text{INFR}_t + \beta_4 \text{GDPPC}_t + \beta_5 \text{UNEMP}_t + \varepsilon_t$$

where  $\text{GINI}_t$  denotes income inequality in year  $t$ ,  $\text{EXR}_t$  is the official exchange rate,  $\text{INTR}_t$  is the real interest rate,  $\text{INFR}_t$  is the inflation rate,  $\text{GDPPC}_t$  is GDP per capita,  $\text{UNEMP}_t$  is unemployment, and  $\varepsilon_t$  is the disturbance term.

The coefficient of primary interest is  $\beta_1$ , which captures the association between exchange rate movements and income inequality, conditional on other monetary and macroeconomic variables. The expected signs are not imposed mechanically because the distributional effect of monetary policy is theoretically ambiguous. For example, exchange rate depreciation may worsen inequality through import-price pass-through, but its measured relationship with inequality may differ where depreciation stimulates domestic production, alters relative prices, or interacts with income growth.

#### 3.3 Estimation Strategy

The empirical analysis proceeds in four steps. First, the time-series properties of the variables are examined using the Augmented Dickey-Fuller unit root test. This step is necessary because estimating non-stationary series in levels can produce spurious inference. The unit root results indicate a mixed order of integration: some variables are stationary in levels,  $I(0)$ , while others become stationary after first differencing,  $I(1)$ . Since none of the variables is integrated of order two,  $I(2)$ , the Autoregressive Distributed Lag approach is appropriate. Second, the paper applies the ARDL bounds testing procedure of Pesaran, Shin, and Smith (2001) to test for a long-run relationship among the variables. The ARDL framework is suitable for this application for three reasons. It accommodates regressors with mixed  $I(0)$

and I(1) properties; it performs reasonably well in small samples; and it permits simultaneous estimation of short-run dynamics and long-run coefficients. Third, once cointegration is established, the long-run coefficients and the associated error correction model are estimated. The error correction specification is important because it separates transitory movements from long-run equilibrium adjustment. The coefficient on the error correction term is expected to be negative and statistically significant. Its magnitude measures the speed at which deviations from long-run equilibrium are corrected. Fourth, Granger causality tests are used to examine predictive direction among the variables. These tests do not establish structural causality in the strict experimental sense. Rather, they indicate whether lagged values of one variable contain information that helps predict another variable after accounting for its own past values. This distinction matters: the results should be read as evidence of temporal precedence and predictive content, not as definitive proof of a policy shock mechanism.

### 3.4 Diagnostic Checks

Model adequacy is assessed using standard post-estimation diagnostics. The Breusch–Godfrey LM test is used to examine serial correlation, while the Breusch-Pagan-Godfrey test evaluates heteroskedasticity. The Jarque–Bera statistic is used to assess residual normality, and the CUSUM test examines parameter stability over the sample period. These diagnostics are necessary because inference from an ARDL model is only credible if the residuals are well behaved and the estimated parameters are stable.

## 4. Results and Discussion

### 4.1 Descriptive Statistics

**Table 4.1: Descriptive Statistics Results**

	GINI	INFR	INTR	UNEMP	EXR	GDPPC
<b>Mean</b>	41.07222	16.97551	7.027665	4.720728	115.0494	1.507951
<b>Median</b>	39.40000	10.30663	7.243559	3.947000	120.5782	1.499771
<b>Maximum</b>	51.90000	75.40165	11.06417	9.788000	358.8108	12.27614
<b>Minimum</b>	35.10000	0.686099	0.724167	3.575230	1.754523	-4.507149
<b>Std. Dev.</b>	6.156558	15.07611	2.288773	1.833686	99.78363	3.746283
<b>Skewness</b>	0.837698	2.035065	-0.944160	1.913858	0.761910	0.504321
<b>Kurtosis</b>	2.258318	7.727386	4.314887	4.971170	2.857484	3.443568
<b>Jarque-Bera</b>	5.035568	58.37121	7.942014	27.80537	3.415908	1.821168
<b>Probability</b>	0.080638	0.000000	0.018854	0.000001	0.181236	0.402289
<b>Sum</b>	1478.600	611.1184	252.9959	169.9462	4026.730	54.28624
<b>Sum Sq. Dev.</b>	1326.612	7955.123	183.3468	117.6841	338530.3	491.2123
<b>Observations</b>	36	36	36	36	35	36

**Source :** Author’s Computation 2026 (E-Views 10).

The descriptive statistics show that the mean value of the Gini index is 41.07, with a maximum of 51.90 and a minimum of 35.10. This indicates that income inequality remained relatively high during the period under study. The exchange rate recorded substantial dispersion, reflecting Nigeria’s history of exchange rate instability and depreciation. Inflation also displayed considerable variation, indicating episodes of macroeconomic instability during the study period. The Jarque-Bera statistics indicate that the variables are normally distributed.

#### 4.2 Unit Root Test

**Table 4.2: ADF Unit Root Test**

Variables	ADF statistics at Level	Critical values at level (5%)	P-values at Level	ADF statistics at first difference	Critical values at first difference (5%)	P-values at Level first difference	Order of integration
<b>GINI</b>	-1.118459	-2.948404	0.6975	-5.665614	-2.951125	0.0000	I(1)
<b>INFR</b>	-3.128519	-2.948404	0.0335	-	-	-	I(0)
<b>INTR</b>	-3.712362	-2.948404	0.0082	-	-	-	I(0)
<b>UNEMP</b>	1.410892	-2.948404	0.9987	-4.783934	-2.951125	0.0005	I(1)
<b>EXR</b>	0.520250	-2.948404	0.9851	-4.856080	-2.951125	0.0004	I(1)
<b>GDPPC</b>	-4.072746	-2.948404	0.0032	-	-	-	I(0)

**Source :** Author’s Computation 2026 (E-Views 10).

The Augmented Dickey-Fuller unit root test reveals that inflation rate, interest rate, and GDP per capita are stationary at level, I(0). Income inequality, exchange rate, and unemployment are stationary after first differencing, I(1). Since the variables are integrated of mixed order and none is I(2), the ARDL bounds testing approach is appropriate.

#### 4.3 ARDL Bounds Cointegration Test

**Table 4.3: Bounds Co-integration Test**

<b>F-Bounds Test</b>		<b>Null Hypothesis: No levels relationship</b>		
<b>Test Statistic</b>	<b>Value</b>	<b>Signif.</b>	<b>I(0)</b>	<b>I(1)</b>
<b>F-statistic</b>	4.919998	10%	2.08	3
<b>K</b>	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

**Source :** Author’s Computation 2026 (E-Views 10).

The ARDL bounds test produces an F-statistic of 4.919998. This value exceeds the upper-bound critical values at the 10 per cent, 5 per cent, 2.5 per cent, and 1 per cent levels of significance. The null hypothesis

of no long-run relationship is therefore rejected. This confirms the existence of a long-run relationship between monetary policy variables, GDP per capita, unemployment, and income inequality in Nigeria. This result implies that monetary policy and broader macroeconomic conditions are jointly linked to the long-run behaviour of income inequality in Nigeria. The existence of cointegration also justifies the estimation of long-run and short-run ARDL models.

#### 4.4 Long-Run ARDL Estimates

**Table 4.4: ARDL Long run Results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	68.66133	16.04462	4.279398	0.0008
GDPPC	-4.840382	1.960175	-2.469363	0.0270
EXR	-0.092897	0.037177	-1.629106	0.0451
INFR	-0.136341	0.178153	-0.765301	0.4568
INTR	-0.495434	1.047029	-0.473181	0.6434
UNEMP	0.615843	2.328860	0.264440	0.7953

**Source :** Author’s Computation 2026 (E-Views 10).

The long-run estimates show that GDP per capita has a negative and statistically significant relationship with income inequality. The coefficient of GDP per capita is -4.840382, with a probability value of 0.0270. This indicates that increases in GDP per capita are associated with reductions in income inequality in the long run. The result suggests that improvements in average income may reduce inequality when growth is sufficiently broad-based or when rising output improves employment and household welfare. Exchange rate also has a negative and statistically significant relationship with income inequality. The coefficient of exchange rate is -0.092897, with a probability value of 0.0451. This finding indicates that exchange rate movements are significantly associated with inequality in Nigeria. The negative sign should be interpreted cautiously because exchange rate effects depend heavily on the structure of the economy, import dependence, inflation pass-through, and the distribution of gains and losses across households. In the context of the model, exchange rate is the most important monetary policy variable with a statistically significant long-run effect on inequality. Furthermore, inflation rate has a negative but statistically insignificant coefficient. This suggests that inflation does not exert a statistically reliable long-run effect on inequality within the estimated model. Interest rate also has a negative but statistically insignificant relationship with inequality. Unemployment has a positive but statistically insignificant effect, which is consistent with the expectation that unemployment may worsen inequality.

### 4.5 Short-Run ARDL Estimates

**Table 4.5: ARDL Short run Results (ECM)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	-0.206714	0.124112	-1.665545	0.1180
D(GINI(-2))	-0.434068	0.118051	-3.676939	0.0025
D(GINI(-3))	-0.460048	0.129143	-3.562314	0.0031
D(GDPPC)	-0.478357	0.087423	-5.471727	0.0001
D(GDPPC(-1))	0.544120	0.143690	3.786771	0.0020
D(GDPPC(-2))	0.222601	0.111434	1.997602	0.0656
D(EXR)	-0.042286	0.012122	-3.488423	0.0036
D(EXR(-1))	-0.011788	0.014086	-0.836904	0.4167
D(EXR(-2))	0.001412	0.015205	0.092889	0.9273
D(EXR(-3))	-0.060201	0.015210	-3.957831	0.0014
D(INFR)	0.018010	0.019316	0.932389	0.3669
CointEq(-1)*	-0.224037	0.031940	-7.014269	0.0000
R-squared	0.852445	Mean dependent var		-0.112500
Adjusted R-squared	0.771290	S.D. dependent var		2.818917
S.E. of regression	1.348108	Akaike info criterion		3.715278
Sum squared resid	36.34791	Schwarz criterion		4.264929
Log likelihood	-47.44444	Hannan-Quinn criter.		3.897472
Durbin-Watson stat	2.083600			

**Source :** Author’s Computation 2026 (E-Views 10).

The short-run results show that GDP per capita has a negative and statistically significant effect on income inequality. The coefficient of the current value of GDP per capita is -0.478357, with a probability value of 0.0001. This indicates that improvements in GDP per capita reduce inequality in the short run. Exchange rate also has a negative and statistically significant short-run effect on income inequality. The current value of exchange rate has a coefficient of -0.042286 and a probability value of 0.0036. In addition, the third lag of exchange rate is also negative and statistically significant. This reinforces the importance of exchange rate dynamics in explaining movements in income inequality in Nigeria. Inflation has a positive but statistically insignificant short-run relationship with inequality. Although the coefficient is not significant, the positive sign suggests that inflationary pressure may worsen inequality in the short run by reducing purchasing power, especially among lower-income households.

The error correction term is negative and statistically significant, with a coefficient of -0.224037 and a probability value of 0.0000. This confirms convergence to long-run equilibrium. The coefficient indicates that approximately 22.4 per cent of short-run disequilibrium is corrected each year. The adjustment speed is moderate, suggesting that shocks to inequality and monetary policy variables dissipate gradually. The model has an R-squared value of 0.852445 and an adjusted R-squared of 0.771290, indicating that the explanatory variables account for a substantial proportion of the variation

in income inequality. The Durbin-Watson statistic of 2.083600 suggests that the model does not suffer from first-order autocorrelation.

#### 4.6 Granger Causality Results

**Table 4.6: Granger Causality Test Result**

Null Hypothesis:	Obs	F-Statistic	Prob.
GDPPC does not Granger Cause GINI	31	0.82305	0.5478
GINI does not Granger Cause GDPPC		2.24134	0.0899
EXR does not Granger Cause GINI	31	3.51246	0.0193
GINI does not Granger Cause EXR		0.47470	0.7907
INFR does not Granger Cause GINI	31	1.71918	0.1762
GINI does not Granger Cause INFR		0.50883	0.7662
INTR does not Granger Cause GINI	31	1.64908	0.1930
GINI does not Granger Cause INTR		0.72696	0.6113
UNEMP does not Granger Cause GINI	31	0.14672	0.9787
GINI does not Granger Cause UNEMP		0.37680	0.8586

**Source :** Author’s Computation 2026 (E-Views 10).

The Granger causality test reveals a unidirectional causal relationship from exchange rate to income inequality at the 5 per cent level of significance. This implies that past values of exchange rate help predict movements in income inequality in Nigeria. The result supports the view that exchange rate dynamics are important in the distributional consequences of monetary policy. The results also show a unidirectional causal relationship from income inequality to GDP per capita at the 10 per cent level of significance. This suggests that inequality may have implications for economic performance, possibly through its effects on human capital, consumption, productivity, and social stability. No significant causal relationship is found between inequality and inflation, interest rate, or unemployment within the pairwise causality framework. The central empirical finding is therefore the causal link running from exchange rate to income inequality.

#### 4.7 Diagnostic Tests

##### 4.7.1. Serial Correlation LM Test

**Table 4.6: Serial Correlation LM Test Result**

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	7.992724	Prob. F(2,12)	0.0962
Obs*R-squared	18.27858	Prob. Chi-Square(2)	0.0601

**Source :** Author’s Computation 2026 (E-Views 10).

Result from the Breusch-Godfrey serial correlation LM test shows that the probability value (0.0962) of the serial correlation test for the model is greater than 5% significance level, leading to rejection of the null hypothesis. It can therefore be concluded that the model is free from serial correlation.

#### 4.7.2 Heteroskedasticity Test

**Table 4.7.2: Heteroskedasticity Test Result**

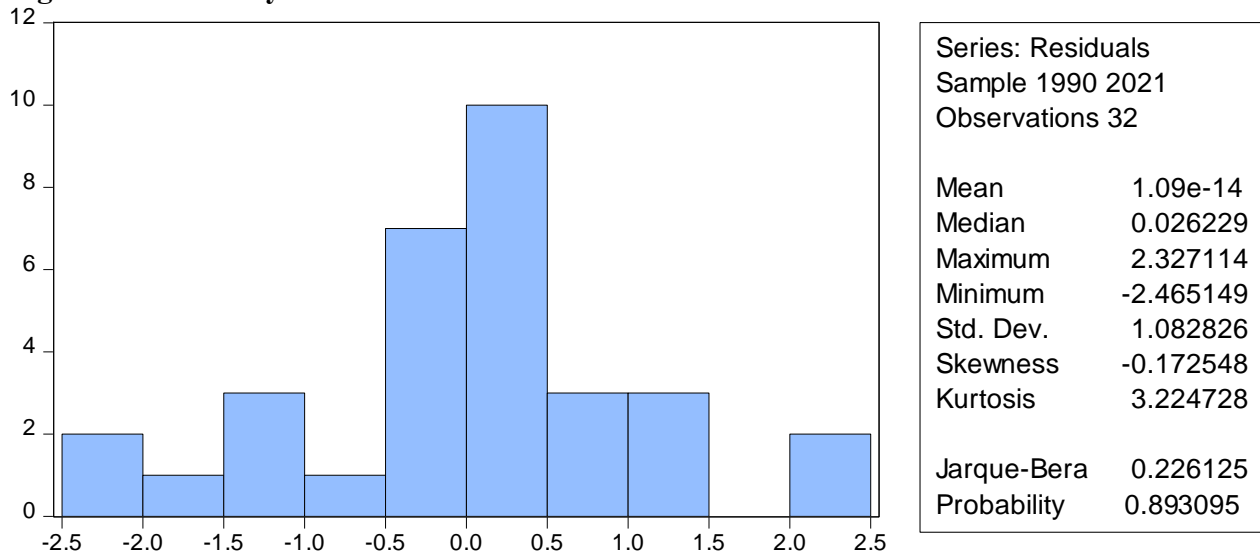
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.493127	Prob. F(17,14)	0.9164
Obs*R-squared	11.98495	Prob. Chi-Square(17)	0.8010
Scaled explained SS	2.551757	Prob. Chi-Square(17)	1.0000

**Source :** Author’s Computation 2026 (E-Views 10).

The Breusch-Godfrey Pagan heteroscedasticity test result shows that the probability value of F-statistics (0.493127) is not significant at 5% significance level. This denotes non rejection of the null hypothesis. The distribution of the error term has a constant variance.

#### 4.7.3. Normality Test

**Figure 1: Normality test**



**Source:** Author’s Computation 2026 (E-Views 10).

The Distribution of Residuals of the Model, as revealed from table 1 above shows that the residuals of the model are normally distributed. This is ascertained, by the fact that the probability value of the Jarque-Bera statistics (89.3%) is greater than 5% level of statistical significance. It therefore implies that the estimates from the model are good, consistent and reliable.

#### **4.8 Discussion of Findings**

The findings show that monetary policy has a long-run relationship with income inequality in Nigeria. Among the monetary policy variables, exchange rate is the most important factor affecting inequality. This is plausible given Nigeria's dependence on imports and foreign exchange earnings from crude oil. Exchange rate movements influence domestic prices, production costs, consumption patterns, and household welfare. When exchange rate instability affects the cost of imported goods and productive inputs, its impact may be transmitted to income distribution.

The significant negative effect of GDP per capita suggests that economic growth can reduce inequality when it improves household income and welfare. However, this result should not be interpreted as automatic evidence that growth is inclusive. Nigeria's development experience shows that growth can coexist with severe inequality when the benefits are concentrated among limited groups. Therefore, the result points to the importance of strengthening the link between growth, employment, productivity, and welfare. The insignificant effect of interest rate and inflation suggests that these variables may not directly explain inequality in the model, or that their effects operate indirectly through exchange rate, output, credit access, or employment. The positive sign of unemployment is consistent with theoretical expectation, although it is statistically insignificant. Overall, the findings imply that exchange rate management is central to the monetary policy-inequality nexus in Nigeria. Monetary policy should therefore be evaluated not only by its effect on inflation and output but also by its distributional consequences.

#### **5. Conclusion and Policy Implications**

This study examined the impact of monetary policy on income inequality in Nigeria using annual time-series data from 1986 to 2021. The study employed the ARDL bounds testing approach, ARDL long-run and short-run estimates, Granger causality tests, and diagnostic tests.

The unit root results show that the variables are integrated of mixed order, thereby justifying the use of the ARDL method. The bounds test confirms the existence of a long-run relationship among income inequality, exchange rate, interest rate, inflation rate, GDP per capita, and unemployment. The long-run results show that exchange rate and GDP per capita have negative and statistically significant effects on income inequality, while inflation and interest rate are negative but insignificant. Unemployment is positive but insignificant. The short-run estimates also show that exchange rate and GDP per capita significantly reduce income inequality. The Granger causality results reveal a unidirectional causal relationship from exchange rate to income inequality and from income inequality to GDP per capita. The study concludes that exchange rate is the major monetary policy variable associated with income inequality in Nigeria. This reflects the structural features of the Nigerian economy, particularly its import dependence, exposure to foreign exchange volatility, and reliance on crude oil earnings. Monetary policy therefore has important distributional implications, especially through the exchange rate channel.

## Policy Implications

The findings suggest that monetary policy in Nigeria should be evaluated not only by its effects on inflation and output, but also by its distributional consequences. Since exchange rate movements significantly affect income inequality, monetary authorities should pursue a more stable and transparent exchange rate framework to reduce uncertainty and protect household purchasing power. The results also imply that exchange rate management must be supported by stronger domestic production. Nigeria's dependence on imported goods makes households vulnerable to exchange rate shocks. Expanding productive capacity in agriculture, manufacturing, energy, and transport would reduce this exposure and weaken the link between currency instability and inequality. Finally, monetary policy should be better coordinated with fiscal and industrial policies. Reducing inequality requires more than exchange rate stability; it also requires employment creation, infrastructure investment, social protection, and broader access to finance.

## REFERENCES

- Aye, G. C., Clance, M. W., & Gupta, R. (2019). The effectiveness of monetary and fiscal policy shocks on US inequality: The role of uncertainty. *Quality & Quantity*, 53(1), 283-295.
- Chuku, C. A. (2009). Measuring the effects of monetary policy innovations in Nigeria: A structural vector autoregressive approach. *African Journal of Accounting, Economics, Finance and Banking Research*, 5(5).
- Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2012). *Innocent bystanders? Monetary policy and inequality in the US* (NBER Working Paper No. 18170). National Bureau of Economic Research.
- Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2017). Innocent bystanders? Monetary policy and inequality. *Journal of Monetary Economics*, 88, 70–89.
- Davtyan, K. (2016). Income inequality and monetary policy: An analysis on the long-run relation. *AQR Working Papers, 2016*, AQR16/04.
- Dossche, M., Slacalek, J., & Wolswijk, G. (2021). Monetary policy and inequality. *Economic Bulletin Articles*, 2(1).
- El Herradi, M., & Leroy, A. (2019). Monetary policy and the top one percent: Evidence from a century of modern economic history.

- Feldkircher, M., & Kakamu, K. (2022). How does monetary policy affect income inequality in Japan? Evidence from grouped data. *Empirical Economics*, 62(5), 2307–2327.
- Furceri, D., Loungani, P., & Zdzienicka, A. (2016). *The effects of monetary policy shocks on inequality*. International Monetary Fund.
- Hohberger, S., Priftis, R., & Vogel, L. (2019). The macroeconomic effects of quantitative easing in the euro area: Evidence from an estimated DSGE model. *Journal of Economic Dynamics and Control*, 108, 103756.
- Hohberger, S., Priftis, R., & Vogel, L. (2020). The distributional effects of conventional monetary policy and quantitative easing: Evidence from an estimated DSGE model. *Journal of Banking & Finance*, 113, 105483.
- Ifurueze, P. C. (2022). Monetary policy instruments and performance of financial sector in Nigeria. *International Journal of Business & Law Research*, 10(3), 61-76.
- Inui, M., Sudo, N., & Yamada, T. (2017). *Effects of monetary policy shocks on inequality in Japan* (Bank of Japan Working Paper No. 17-E-3). Bank of Japan.
- Mayah, E., Mariotti, C., Mere, C. E., & Odo, C. O. (2017). *Inequality in Nigeria: Exploring the drivers*. Oxfam International.
- Othman, A. H. A., Alhabshi, S. M., Kassim, S., Abdullah, A., & Haron, R. (2020). The impact of monetary systems on income inequity and wealth distribution: A case study of cryptocurrencies, fiat money and gold standard. *International Journal of Emerging Markets*.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- Saiki, A., & Frost, J. (2014). Does unconventional monetary policy affect inequality? Evidence from Japan. *Applied Economics*, 46(36), 4445-4454.
- Saiki, A., & Frost, J. (2020). Unconventional monetary policy and inequality: Is Japan unique? *Applied Economics*, 52(44), 4809-4821.

- Siami-Namini, S., Lyford, C., & Trindade, A. A. (2020). The effects of monetary policy shocks on income inequality across US states. *Economic Papers: A Journal of Applied Economics and Policy*, 39(3), 204-221.
- Tolulope, A. O. (2021). Monetary policy shocks and income inequality in Nigeria: Do effects of anticipated and unanticipated shocks differ? *African Journal of Economic Review*, 9(2), 1-18.
- Vivien, C. (2021). How does monetary policy affect income inequality? Evidence from Europe. *Európai Tükör*, 24(1), 95-112.
- Yoshino, N., Taghizadeh-Hesary, F., & Shimizu, S. (2018). Impact of quantitative easing and tax policy on income inequality: Evidence from Japan.