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INFLATION AND INCOME INEQUALITY IN NIGERIA

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Abstract

This study examined the effect of inflation on income inequality in Nigeria from 1985-2022. Annual time series data on Gini index – income inequality, inflation rate and unemployment rate were sourced from the statistical bulletin of Nigeria's apex bank, Standardized World Income Inequality Database (SWIID), World Bank - World Development Indicator. The study employed an Autoregressive Distributed Lag (ARDL) Bounds testing technique as the main analytical tool. The results of the analyses revealed the presence of a long run association amongst the variables. The results also showed that both in the long and short runs, inflation rate and unemployment rate have negative and significant relationship with income inequality. Based on the findings this study recommended that policies to tackle inflation problem should have an inbuilt ability to mitigate income inequality, increase employment and productive capacity of the economy.

Keywords: Inflation, Income Inequality, Gini Index, ARDL and Nigeria

INTRODUCTION

One of the objectives of economic policies is to elevate the standards of living of the entire population. An equitable distribution of income allows for all citizens to enjoy high standards of living. However, disproportionate distribution of total national income among households is generally viewed as unfair. Even if there is high national income levels in

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countries with highly uneven distributions of total national wealth (income), true welfare cannot be attained until there is equitable distribution of income among all individuals. In economic literature, economists have emphasized the importance of income distribution. For instance, Ricardo cited in Miçoğulları (2023) stated that the real goal of economics is to investigate how national welfare is distributed among individuals engaged in production as well as the factors that contribute to this growth (Ünsal, 2010 and Miçoğulları, 2023). Conversely, Piketty (2014) argued that the distribution of wealth is not only a concern for economists but also for social scientists, historians, and other thinkers.

Furthermore, a report from the National Bureau of Statistics (NBS, 2018) reveals that inequality in Nigeria worsened between 2004 and 2013 but improved in 2016 using either the Gini coefficient or Theil. Inequality as measured by the Gini worsened from 0.356 in 2004 to 0.41 in 2013 but improves to 0.391 in 2016. Using Thiel, inequality worsened from 0.217 in 2003 to 0.395 in 2013 but improved to 0.31 in 2016. In terms of consumption proportions (thus using consumption as a stand-in for income), the top 10% of the population (the supper rich) consumed 26.59% of all goods and services in 2004, while the bottom 10% of the population (the poorest of the poor) consumed 2.56%. In 2013, this went up to 33.72%, but by 2016, it had dropped to 31.09%. In 2004, the wealthiest 20% accounted for 42.40% of the country's income and spending. In 2013, this went up to 48.28%, but by 2016, it had dropped to 46.63% (NBS, 2018). According to World Bank data, Nigeria's Gini income inequality index for 2010, 2012, 2015 and 2018 stood at 35.70, 35.50, 35.90 and 35.10 respectively (World Bank, 2018).

In addition, the reduction of income inequality is a key component of the present global development agenda. For example, number ten of the Sustainable Development Goals (SDGs) aims at reducing inequality within and among countries. African Union Agenda 2063 also aims at reducing income inequality between individuals in African economies. One factor influencing income distribution in a country is inflation. The impact of inflation on income distribution raises questions about how different segments of the economy can be affected and how these effects can shape social inequality. In an inflationary period, the store of value function of money suffers greatly with concomitant implication on output, employment and income distribution (Gbosi, 2015). An unexpected increase in inflation can affect an individual's wealth. Inflation redistributes real wealth from lenders to borrowers by changing the real value of nominal assets and liabilities. Unexpected high inflation episodes tend to reduce the real value of nominal income, and consequently of real wealth. However, after the unexpected shock, wages and other sources of income may evolve differently across workers, while in many countries some sources of income, such as pensions, are indexed to inflation. Thus, inflation could have an uneven impact on the real income of individuals.

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High inflation discourages savings and investment, and thus, impedes productivity and output growth (Umo, 2012). This in turn will reduce investment in key primary welfare sectors of the economy. This will affect the way income is distributed. Importantly, poorer individuals have a higher marginal propensity to consume (MPC) because they have more essential goods and services that they need to buy compared to the rich. A more equal distribution of income allows these individuals to consume more and thus this spurs economic growth. Strictly speaking, inflation does not affect all income sources homogeneously. Since households differ in their sources of income, the impact of inflation on their total incomes will not be homogeneous either. By affecting each household differently, inflation can thus modify the income distribution.

Despite the critical role of income distribution in economic welfare and societal balance today, research concentrating on this topic in Nigeria is very scanty. There is no gain saying that effective and equitable management of income distribution due to economic dynamics is the foundation of sustainable economic growth and development. In this case, it is critical to comprehend the factors influencing income distribution, especially investigating the possible effects of inflation on income distribution, is of utmost importance. Therefore, the main objective of this study is to investigate the effect of inflation on income inequality in Nigeria. The remaining sections of this paper were organized into literature review, materials and methods, results and discussions, conclusion and recommendations.

LITERATURE REVIEW

Conceptual Clarification and Philosophy

Inflation means continuous rise in general price level of goods and services in an economy. Put differently, inflation is the persistent rise in the general price level of goods and services in all sectors of an economy. There is an inverse relationship between the general price level and the value of money. Importantly, Bawa, Abdullahi and Ibrahim (2016) submitted that the importance of inflation is premised on the distortions that high inflation can exert on domestic macroeconomic conditions, with the potential to derail the economy from the path of sustainable economic growth and development. The development of the financial industry, general growth, and the vulnerable impoverished population are all negatively impacted by inflation. High rate of inflation discourages saving. Therefore, inflation, whether anticipated or not, tends to penalize savers (Umo, 2012). This behaviour will have negative effect on the economy because low saving will reduce the pool of investment funds in the economy.

At the same time, Umo (2012) argued that inflation has the effect of arbitrarily redistributing income in the society so that some people or sectors of the economy gain and others lose. Supporting this, Akpakpan (1999) argued that high inflation rate will distort income

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distribution pattern in the country. It has the ability to unfairly redistribute income in the country. This was what informed Gbosi (2015) to describe inflation as a social malady as well as a pervasive economic problem whose effects are felt to some degree, by every citizen an all sectors of the economy.

The rapidity with which prices change serves as a basis for classifying inflation. Thus, we have creeping inflation, suppressed inflation and hyperinflation. According to Umo (2012), "creeping inflation describes a rate of inflation which is not too high. It is considered that between 2% and 3% qualifies as creeping inflation. This type of inflation is said to be useful for the growth of the economy because of its stimulating effects on investment and output". Suppressed inflation does not show up explicitly in the price levels but shoots up suddenly when the factors responsible for suppressing it have been removed. For example, tight price controls during war cause the intensity of unfulfilled demand to accumulate. Immediately controls are lifted, possibly after the war, the pent-up demand expresses itself in an open high inflation rate (Umo, 2012). However, hyperinflation occurs when the rate of inflation is so high that an increase in the economy's output is virtually impossible because of a break in monetary mechanism. Umo (2012) submitted that this type of inflation is sometimes called 'galloping inflation'. It is often associated with an increase in aggregate demand which is backed up with a massive increase in money supply. According to Ohale and Onyema (2002), hyperinflation refers to a period of very fast rise in prices at short intervals such that price variations within the period are very remarkable. Such situation may lead to money not serving as an effective medium of exchange due to its very low purchasing power. Another name for it is run-away inflation. Ohale and Onyema (2002) further stated that "hyperinflation in its worst state will be triple digits or more per week or month".

To understand the possible channels through which inflation can potentially increase or decrease income inequality. This study first divided total income into three categories: labour income, capital income and government transfers. ***Labour Income Channel:*** Inflation can modify labour income distribution through two channels: an inflation exposure channel and the Cantillon effect. The notion that wages are correlated with inflation to varying degrees is the foundation of the inflation exposure channel. A wage that is contractually indexed to inflation is a better hedge against inflation than one that is not. In a similar vein, bonuses are frequently correlated with a company's stock performance, which may fluctuate in line with inflation and act as a hedge. The Cantillon effect reflects the lag between the moments when money is created, and when this expansion translates into inflation (Bordo, 1983). Concretely, new money hits the agents first that are the closest to the money creation process (e.g. bank employees) (Williamson, 2008, and Ledoit, 2011). When these agents' income increases, they will spend the

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extra cash on products and services, which encourages additional spending by other economic agents and eventually, but slowly, drives up inflation. This lag may also be a transient factor influencing the distribution of income. ***Capital Income Channel:*** Dividends and interest payments from investments provide people with a second source of income, and they may also present a number of options for hedging against inflation. However, due to entry costs and hurdles, households do not all have equal access to the financial markets. Low-income households suffer from the ensuing financial market segmentation, which hinders their ability to employ financial innovations as a stronger inflation buffer. ***Government Transfers Channels:*** The impact of inflation on government transfers depends on the degree of inflation adjustment in each country's transfer scheme. Generally, when transfers are indexed, lower-income households benefit as they receive, on average, a larger share of their income from transfers (e.g. unemployment benefits, food stamps).

Furthermore, income inequality is defined as the inequitable distribution of income among the members of a particular group, an economy or society (Lucky and Achebelema, 2018). The disproportionate distribution of income can be measured generally using the Lorenz curve, the Gini coefficient and General Entropy class. The Gini coefficient is most frequently used measure and it is close to the Lorenz curve. It is a final and very convenient shorthand summary measure of the relative degree of income inequality in a country. The Gini coefficient measures income inequality based on the Lorenz curve. It has values between zero (0) and one (1). Figures closer to zero (0) signifies more equality in the distribution of income, values closer to one (1) shows higher inequitable distribution of income, zero (0) signifies absolute equality in the distribution of income and one (1) signifies absolute inequality in the distribution of income. Put differently, the higher the value of the Gini coefficient, the higher the inequality of income distribution; the lower it is, the more equal the distribution of income.

Empirical Literature

Only a handful of empirical studies have been carried out on inflation and disproportionate distribution of income. This section reviewed some of these studies for proper identification of techniques to adopt and explanatory variables to include in the model for the inflation and income inequality nexus in Nigeria. For instance, in a panel study of 37 developing Asian countries for the years 2004-2012, Park and Mercado (2015) observed a negative relationship between inflation and income distribution.

Muhibbullah and Das (2019) investigated the impact of inflation on income inequality in Bangladesh from 1990-2015 using Vector Error Correction Model (VECM). The result revealed a positive relationship between inflation and income inequality.

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Law and Soon (2020) looked at how institutional quality affected the connection between income inequality and inflation. The study Applied two-step system generalised method of moment to an unbalanced panel dataset comprising non-overlapping 4-year average data for 65 developed and developing nations from 1987 to 201. According to the coefficients for both inflation and institutional quality, income inequality will rise in response to rising inflation while it will decrease in response to falling institutional quality. Improved institutional quality will, however, lessen the impact of inflation, indicating the possibility of an institutional quality mediation effect. However, the marginal effects indicated that income disparity will be reduced by institutional quality and inflation. Therefore, it was recommended that policymakers enhance institutional quality because it has both direct and indirect impact on income inequality through its relations with inflation.

Özdemir (2020) examined the relationship between inflation and income distribution (measured with labour share of income). The fixed effect was used to estimate balanced panel dataset which includes yearly data from 1980 to 2017 for selected 19 advanced economies. The estimates of inflation and bargaining power indicators showed that an increase in inflation will unexpectedly increase the income shares accrued to labour and a higher degree of unionization will increase the labour's share. However, the unemployment rate as considered another bargaining power indicator has some mixed results with statistically insignificant coefficients. Meanwhile, the positive effect of inflation will be mitigated by higher degree of unionization and unemployment rate, suggesting the existence of a mediating effect from the bargaining power indicators.

Ibrahim and Okoh (2021) employed ordinary least squares to examine the impact of income inequality on economic development in Nigeria from 1989 to 2020. The findings revealed that income inequality as proxied by Gini coefficient and poverty rate has a negative and significant impact on per capita income, while inflation rate has a negative but insignificant impact on per capita income in Nigeria.

Miçoğulları (2023) employed AutoRegressive Distributed Lag (ARDL) bounds testing approach to examine the impact of inflation on income distribution in the Turkish economy for the period 1987-2021. The findings revealed a positive relationship between inflation and income distribution both in the short and long runs.

Glawe and Wagner (2024) investigated nonlinearities in the inflation-inequality relationship using a dynamic threshold panel data model and data for 101 countries over the period 1985–2020. The finding revealed that inflation rates exceeding 6% are associated with higher income inequality whereas below this threshold, the correlation remains insignificant. From a monetary policy perspective, these findings suggested that a disinflation policy will likely

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lead to a more equal income distribution in high-inflation countries whereas there is no such effect in a low-inflation setting. The result also revealed that a higher initial level of inequality as well as unemployment has an inequality-enhancing effect. Contrary to previous research, Glawe and Wagner (2024) inflation threshold is endogenously determined, and they controlled for the Nickell bias arising from the inclusion of the lagged level of inequality. Glawe and Wagner (2024) findings have important policy implications, especially against the background of the recent sharp increase in inflation in Nigeria.

Stylized Facts on Inflation and Income Inequality in Nigeria

The continuous rise in general price level of goods and services in Nigeria is of primary concern to all stakeholders. Strictly speaking, Nigeria's rising rate of inflation has warranted considerable attention. Nigeria has witnessed high and volatile inflation rates since 1980. For instance, available evidence from the Central Bank of Nigeria statistical bulletin of various issues reveals that in 1980, 1981, 982, 1983, 1984 and 1985; inflation rates were 9.90, 20.90, 7.70, 23.20, 39.60 and 5.50 percent respectively. The inflation rate fell slightly in 1986. In that year, inflation rate was 5.40 percent. In 1987, the year Structural Adjustment Programme was implemented in Nigeria, the inflation rate increased to 10.20 percent. In 1988 and 1989 inflation rates stood at 38.20 and 40.90 percent respectively. It fell to 7.50 percent in 1990. In 1991, 1992, 1993, 1994, inflation rates stood at 13.00, 44.50, 57.20, and 57.00 percent respectively. Available evidence shows that inflation reached its peak in Nigeria in 1995. In that year, the country's inflation rate stood at 72.80 percent. It later decreased to 29.30 percent in 1996. The high rates of inflation observed in 1995 and 1996 were attributed to the high incidence of distress which characterized the Nigerian banking industry in those two years (Gbosi, 2015). In 1997 and 1998, inflation rates stood at 8.50 and 10.00 percent respectively. Inflation rate decreased sharply in 1999 and 2000. In these years, Nigeria's inflation rates were 6.60 and 6.90 percent respectively. The restrictive monetary and fiscal policies adopted by the monetary authorities during the period might have been responsible for the trend. However, the continued double digit inflation rate is worrisome. In 2001, 2002, 2003, 2004 and 2005, inflation rates stood at 18.90, 12.90, 14.00, 15.00 and 17.90 percent respectively. It decreased sharply in 2006 and 2007. In these years, inflation rates were 8.20 and 5.40 percent respectively. Inflation rate rose to 11.60, 12.50, 13.70, 10.80 and 12.20 percent in 2008, 2009, 2010, 2011 and 2012 respectively. Meanwhile, inflation rates were 8.50, 8.10, 9.01, 15.70 and 16.50 percent in 2013, 2014, 2015, 2016 and 2017. In 2018, 2019 and 2020, inflation rate stood at 12.10, 11.4 and 13.25

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percent respectively. In the year 2021, 2022 and 2023 inflation rate increased sharply to 16.95, 18.85 and 24.16 percent respectively (CBN, Various Issues).

Inflation is bad because it hurts those on fixed income the most, by reducing their real income. This is because, during an inflationary period, the value of money is substantially reduced. Another effect of inflation is that it brings about a redistribution of income. During the periods of inflation, borrowers usually gain at the expense of lenders. Inflation also transfers financial resources from the private sector to the government. Taxes are usually paid on money income. As a result, people are put in higher tax bracket during the period of inflation. Another adverse effect of inflation is that it reduces the amount of Gross National Savings. It is often argued that saving is a positive function of interest rate. Thus, the lower returns on savings will lead to lower level of savings in the economy. Inflation is also bad because it encourages squandering, gambling and reckless waste of all kinds. It often makes it more profitable to speculate than to produce. It tears apart the whole fabric of stable economic relationships. Finally, rising prices of goods and services have forced many to resorting to illegal means of getting money in Nigeria. Consequently, the end result is an increase in crime rate in the country.

In Nigeria the scale of economic inequality has reached extreme levels, and it finds expression in the daily struggles of the majority of the population in the face of accumulation of obscene amounts of wealth by a small number of individuals while the majority of people are living in poverty. Income inequality and poverty in Nigeria is particularly outrageous because they have been growing in the context of an expanding economy where the benefits have been reaped by a minority of people, and have bypassed the majority of the population. Income inequality, as measured by Oxfam International in May 2017 revealed that the Gini Index grew from 40% in 2003 to 43% in 2009. According to World Bank data, in 1985, Nigeria's Gini income inequality index was 38.70. It increased to 45.00 in 1992 and recorded its highest figure in 1996 with a Gini income inequality index of 51.90. In 2003, Nigeria's Gini income inequality index was 40.10. In 2010, 2012, 2015 and 2018 stood at 35.70, 35.50, 35.90 and 35.10 respectively (World Bank, 2018). Nigeria has a high rate of regional inequality, which contributes to greater rates of poverty. In Nigeria, poverty and inequality result from the improper use, misallocation, and theft of resources rather than a lack of them.

The fundamental cause is a political elite disconnected from the problems faced on a daily basis by ordinary Nigerians, along with a culture of corruption and rent-seeking. The intersection of political and economic power sways policy decisions in favour of the wealthy and vested interests in the distribution of opportunities, income, and wealth. The first effect

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is the enormous expense of government. Costs of maintaining the machinery of government are also inflated by the excessive staff numbers, inflated salaries and benefits, arbitrary increase in the number of government agencies and committees, hidden allowances and oversized retirement packages. The high cost of governance reinforces inequality because it means that few resources are left to provide basic essential services for the wider, growing Nigerian population.

Elite capture of public sector policies and resources undermines the productivity of the most important sectors of the economy and prevents the fair distribution of the benefits of growth. This is especially notable in agriculture and in the oil sector. Agriculture is the main source of non-oil exports and employs almost half of the Nigerian population. However, unfavourable policies have prevented small, poor farmers from benefiting from agricultural growth (Oxfam International May 2017).

MATERIAL AND METHODS

The Study

This descriptive study employed Augmented Dickey Fuller (ADF) unit root test and an Autoregressive Distributed Lag (ARDL) Bounds testing techniques. Precisely, this study used an econometric model aimed at capturing the relationship between inflation and income inequality in Nigeria. Guided by the perceived functional association between the matrix of inflation and income inequality, a link is provided between the variables in line with the related literature reviewed. Specifically, this work adapted the model of Miçoğulları (2023) who investigated the impact of inflation on income inequality in Turkey**.** That is, the model was cast in agreement with that of Miçoğulları (2023)**,** whose model is in the form ENF = f(GINI) but with important modification. This study included one control variable – unemployment rate not included in the work of Miçoğulları (2023)**.** This study also repositioned the explained and explanatory variables very well. Strictly speaking, the model for this study states that, income inequality proxied by Gini Index (GI) depends on Inflation Rate (INF) and Unemployment Rate (UNE). The functional relationship and the resultant model for this study is as specified below (i.e., the model for this study is presented thus):

$$GI = F(INF, UNE) \quad (1)$$

$$GI_t = a_o + a_1 INF_t + a_2 UNE + u_t \quad (2)$$

Where: GI = Income Inequality, INF = Inflation Rate, UNE = Unemployment Rate, u = Error Term, a_0 = the constant parameter, a_1, a_2 and a_3 = the slope parameters.

Apriori expectation: On the apriori: a_1 and $a_2 > 0$

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Model Estimation Procedures

This study employed unit root test via Augmented Dickey Fuller test (ADF) and Autoregressive Distributed Lag (ARDL) Bounds testing techniques to analyze research data sourced from the statistical bulletin of the Central Bank of Nigeria. The ADF unit root test helped to ascertain stationarity of the variables, and the general form of the ADF is presented thus:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \Sigma\alpha_1\Delta y_i + \delta_t + {}_{Ut} \qquad (3)$$

Where: y is a time series, t is a linear time trend, Δ is the first difference operator, α_0 is a constant, n is the optimum number of lags in the independent variables and U is random error term.

In order to examine the short-and long-term relations between treasury bills and economic growth, Autoregressive Distributed Lag (ARDL) was used. The reason is that estimates provided by ARDL method avoid problems such as autocorrelation and endogeneity, they are unbiased and efficient. The ARDL model for this study is presented thus:

$$\Delta GI_{t,j} = C_0 + C_1 GI + C_2 INF_{t-1,j} + C_3 UNE_{t-1,j} + \sum_{i=1}^{n1} a_{1i,j}\Delta GI_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j}\Delta INF_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j}\Delta UNE_{t-1,j} + \lambda ECMt - 1 + \mu_t \qquad (4)$$

Where, Δ is the difference operator while μt is white noise or error term, n is the optimal lag length, α_1, α_2, α_3, represent the short run dynamics of the model and c_1, c_2, c_3, are the long run elasticities and μ_t is the error term. ECM_{t-1} is the error correction term obtained from the co-integration model. The error coefficients (λ_1) show the rate at which the co-integration model corrects its previous period's disequilibrium or speed of adjustment to restore the long run equilibrium relationship.

The coefficient of ECM is expected to be negative and statistically significant. A negative and significant ECM_{t-1} coefficient implies that any movement in short run between the explained and independent variables will converge back to the long run relationship.

RESULTS AND DISCUSSION

Descriptive Statistics for Underlying Series

This study used descriptive statistics to describe the basic features of the data in the study. Specifically, the essence of the descriptive statistics is to ascertain stability of the time series.

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Table 1: Descriptive Statistics *(E-views 10 output)*

	GI	INF	UNE
Mean	41.01579	18.47237	11.07895
Median	40.90000	12.95000	10.05000
Maximum	42.80000	72.80000	33.30000
Minimum	39.20000	5.400000	4.000000
Std. Dev.	1.072891	16.05251	5.712346
Skewness	0.246273	1.949885	1.862286
Kurtosis	1.842083	5.956299	7.577501
Jarque-Bera	2.507008	37.91754	55.14109
Probability	0.285503	0.000000	0.000000
Sum	1558.600	701.9500	421.0000
Sum Sq. Dev.	42.59053	9534.278	1207.343
Observations	38	38	38

Note: GI, INF and UNE as earlier defined

The descriptive statistics reported in Table 1, indicates that income inequality (GI), inflation rate (INF) and unemployment rate (UNE) averaged 41.01579, 18.47237 and 11.07895 respectively during the period of study. The standard deviation showed that all the variables converged around their mean. The Skewness test result showed positive values for all the variables, suggesting that they have high tails. Income inequality is platykurtic relative to normal, since its value for kurtosis 1.842083 is less than 3. This suggests that the variable has short and thin tail, and its central peak is lower and broader. Moreover, inflation rate and unemployment rate have leptokurtic distribution relative to normal, since their values for kurtosis 5.956299 and 7.577501 are more than 3. This indicates a flatter than normal distribution and the variables have large tails. That is, they have longer and fatter tails, and their central peaks are higher and sharper.

At the same time, the probability of Jarque-Bera statistics suggests that the hypothesis of normal distribution for income inequality was accepted at 5% level while the hypotheses of normal distribution for inflation rate and unemployment rate were rejected at 5% level. Thus, the researcher concluded from the revealed statistical properties of the time series that some of the variables are not normally distributed, which may have resulted from the problem of unit root. This necessitated the unit root test for stationarity as shown in Table 2.

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Table 2: Augmented Dickey-Fuller (ADF) Unit Root Test *(E-views 10 output)*

Variables	Level form		First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
GI	-1.634707	-3.536601	-6.040099	-3.540328	1(1)
INF	-2.585502	-3.568379	-4.515128	-3.580623	1(1)
UNE	-4.298968	-3.536601	-	-	1(0)

Note: GI, INF and UNE as earlier defined

The result of the ADF test for each of the series presented in Table 2 reveals that at five per cent level of significance, UNE was stationary at level 1(0) as its ADF statistics is greater than 5 per cent critical value, while GI and INF were stationary at first difference 1(1). Given that the variables were integrated of order 1(0) and 1(1). The requirement to fit in an ARDL model to test for long run relationship is satisfied.

Table 3: ARDL Bounds Test for Co-integration *(E-views 10 output)*

Model		**F-Statistic =** 9.657060
GI= F(INF, UNE)		K = 3
Critical Values	Lower Bound	Upper Bound
5%	3.1	3.87

The result of the ARDL bounds test for co-integration reveals that there is a long run relationship amongst the variables (GI, INF and UNE). This is because the computed F-statistic of about 9.7 is greater than the upper critical bounds at 5% critical value. This provided evidence to discard the null hypothesis of no cointegration at 5% significance level for the income inequality (GI) model. Based on this finding, the study obtained the long-run and short-run dynamic parameters for the variables.

Table 4: Estimated ARDL Long Run Coefficients *(E-views 10 output)*
Dependent Variable: GI ARDL (4, 2, 2)

Regressors	Coefficient	t-Statistic	P-Value
INF	-0.252620	-3.121440	0.0048
UNE	-0.290740	-3.747408	0.0011

The estimated ARDL long run coefficients in Table 4 reveal that in the long run, inflation rate and unemployment rate have negative and significant relationship with GI (income inequality) in Nigeria. However, this outcome is not consistent with economic theory.

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Table 5: Error Correction Representation for the
Selected ARDL Model ARDL (4, 2, 2) *(E-views 10 output)*

Regressors	Coefficients	t-Statistic	P-Value
INF	-0.038220	-4.290258	0.0003
UNE	-0.044044	-2.249443	0.0344
ECM (-1)	-0.278956	-6.608079	0.0000
R^2 = 0.654878	**D-W stat. =** 2.015092		
Akaike info criterion = 0.936426;	Schwarz criterion = 1.295570		
F-statistic = 9.500944;	Prob(F-statistic) = 0.000527		

Table 5 shows the result of the short-run dynamic coefficients associated with the long-run relationships obtained from the ECM equation. The Error Correction Term in the model has the right sign (i.e., negative) and statistically significant. This indicates adjustment to long-term equilibrium in the dynamic model. Put differently, it indicates adjustment from short run equilibrium to long-run equilibrium in the dynamic model. This implies that deviations from the short-term income inequality adjust to long run equilibrium. The Durbin Watson (DW) value of 2.015092, suggests that autocorrelation is not a problem to the model. Moreover, the dynamic relationship between the variables as captured by the parsimonious ECM reveals that the descriptive power of the model - R^2 is approximately 0.65, which means the model is a good fit. It indicates that over the sampled period, about 65 percent variation in income inequality is explained by systematic changes in the adopted variables as initially defined while the remaining 35% is explained by factors not included in the model but captured as the error term in the model.

Interestingly, inflation rate and unemployment rate have negative and significant relationship with income inequality. It was evident from the results that a percentage increase in inflation rate and unemployment rate will decrease income inequality by 0.038220% and 0.044044% respectively. This finding corroborates the empirical findings of earlier scholars including Hongyi and Heng-fu (2002), who affirmed a negative association between inflation and income inequality. This relationship indicates that an increase in inflation rate does not have an exacerbating effect on income inequality in Nigeria during the period of study.

Post Estimation Diagnostic Tests Results

Diagnostic tests were conducted in this study to verify whether or not the estimated model is reliable for policy prediction or recommendation purpose. This study specifically employed the Wald test for coefficient of restriction, Breusch-Godfrey Serial Correlation LM Test

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and normality test for the diagnostics or post-estimation analyses. The various test results are hereby reported in Table 6, 7 and Figure 1.

Wald Test

The Wald test is applied to confirm if the coefficients of the causal variables in the ECM model are jointly significant. The F-statistic in Tables 6 was utilized to ascertain this.

Table 6 Wald Test Results *(E-views 10 output)*

Equation: Untitled			
Test Statistic	Value	Df	Probability
F-statistic	62.47627	(3, 23)	0.0000
Chi-square	187.4288	3	0.0000

The result in Table 6 shows that the F-statistic is 62.47 and the probability value of 0.0000 is less than 0.05 at the conventional 5 per cent level. Therefore, all the independent variables used in the model are jointly important in explaining income inequality in Nigeria during the period of study.

Test for Serial Correlation

The Breusch-Godfrey Serial Correlation LM test was used as a higher order test statistic for testing the null hypothesis of no serial correlation against the inferred alternative hypothesis of serial correlation in the ECM result at 5 per cent level of significance.

Table 7: Breusch-Godfrey Test for Serial Correlation *(E-views 10 output)*

F-statistic	1.126150	Prob. F(2,21)	0.3431
Obs*R-squared	3.293359	Prob. Chi-Square(2)	0.1927

The result as displayed in Table 7 reveals that the error correction model is not suffering from serial autocorrelation problem. This is because the chi-square value and the corresponding probability value of the chi-square statistic surpass the 0.05.

Normality Test Result

The Jarque-Bera statistic was applied to examine whether the error term in the economic growth model is normally distributed at 5 per cent significance level.

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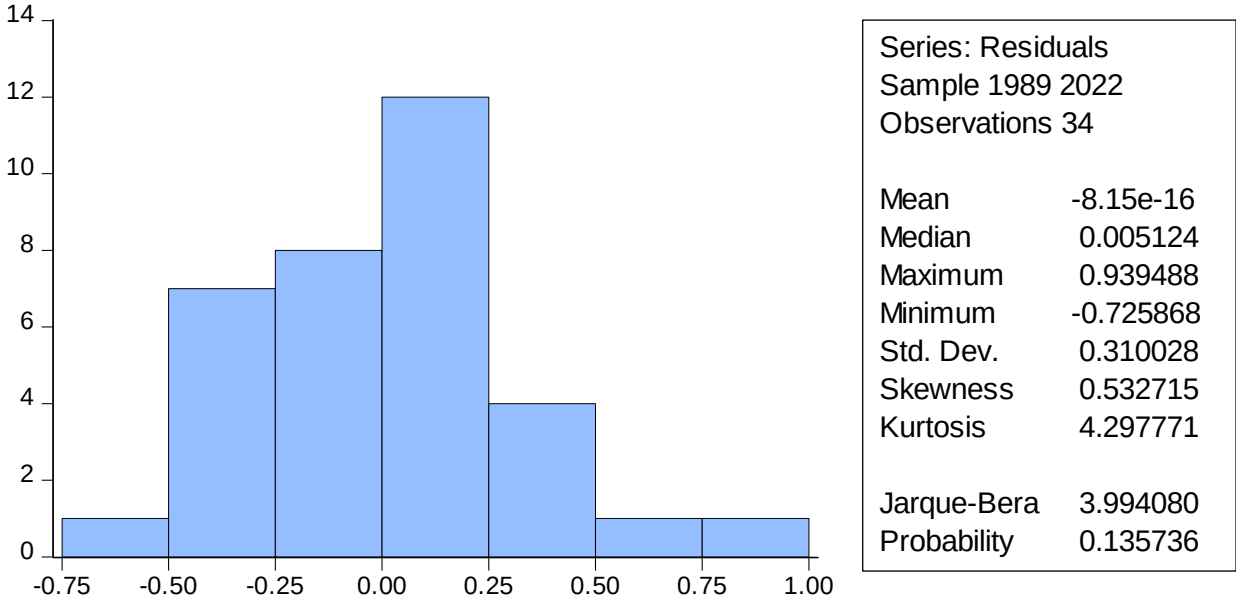

Figure 1: Normality Test Result *(E-views 10 output)*

The result shown in Figure 1 depicts that the error term is normally distributed at the conventional level (i.e., 5%). This is because the probability value of the Jarque-Bera statistic of approximately 0.135736 is greater than the 0.05% conventional level. This implies that the Jarque-Bera statistic hypothesis of normally distributed residuals in the ECM model is accepted.

CONCLUSION AND RECOMMENDATIONS

This study investigated the impact of inflation on income inequality in Nigeria from 1985-2022. With the utilization of data on Gini index, inflation rate and unemployment rate from the statistical bulletin of Nigeria's apex bank, Standardized World Income Inequality Database (SWIID), World Bank - World Development Indicator. The study employed an Autoregressive Distributed Lag (ARDL) Bounds testing technique as the main analytical tool. The results of the analyses revealed the presence of a long run association amongst the variables. The results also showed that both in the long and short runs, inflation rate and unemployment rate have negative and significant relationship with income inequality. What this outcome implies is that inflation rate and unemployment rate do not have exacerbating effects on income inequality in Nigeria during the period of study.

Based on the findings, this study recommended that policies to tackle inflation problem should have an inbuilt ability to mitigate income inequality, increase employment and productive capacity of the economy. There should be a well combination and coordination of

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both fiscal and monetary policies to tackle the problem of income inequality in Nigeria. To achieve this, fiscal policy can play an essential role by tackling unemployment, restructuring taxation, improving social safety nets and etcetera. In addition, monetary policy also can play a vital role in controlling money supply as well as inflation. Moreover, it is obvious that the subject matter of this study is by no means exhausted in this paper. Therefore, further studies should extend the time frame covered by this study and focus on the effect of inflation on poverty in Nigeria.

REFERENCES

Akpakpan, E. B. (1999). *The Economy: Towards a New Type of Economics*. Port Harcourt: New Generation Publishers.

Bawa, S., Abdullahi, I. S. & Ibrahim, A. (2016). Analysis of Inflation Dynamics in Nigeria (1981 – 2015). *Central Bank of Nigeria Journal of Applied Statistics*, 7 (b), 255-276.

Bordo, M. (1983). Some Aspects of the Monetary Economics of Richard Cantillon. *Journal of Monetary Economics*, 12(2), 235–258.

Gbosi, N. G. (2015). *Contemporary Macroeconomic Problems and Stabilization Policies* (2nd edition). Spirit and Truth Publishers, Benin City, Nigeria.

Glawe, L. & Wagner, H. (2024). Inflation and inequality: new evidence from a dynamic panel threshold analysis. *International Economics and Economic Policy* (2024), 21:297–309.

Hongyi, L. & Heng-fu, Z (2002). Inflation, Growth, and Income Distribution: A Cross-Country Study. *Annals of Economics and Finance 3, 85–101 (2002).*

Ibrahim, V. H. & Okoh, M. O. (2021). Income Inequality and Economic Development in Nigeria: An Empirical Assessment. *Journal of Economics and Allied Research, 6(4), 100-109.*

Law, C. H., & Soon, S. V. (2020). The impact of inflation on income inequality: the role of institutional quality. *Applied Economics Letters*, 27(21), 1735-1738.

Ledoit, O. (2011). The Redistributive Effects of Monetary Policy. *University of Zurich Department of Economics Working Paper No. 44*.

Lucky, A. L. & Achebelema, D. S. (2018). Poverty and Income Inequality in Nigeria: An Illustration of Lorenz Curve from NBS Survey. *American Economic & Social Review*, 2(1), 80-92.

Miçoğulları, S. A. (2023). Relationship between Inflation and Income Distribution: An Analysis for Turkey Using ARDL Approach. *Malatya Turgut Özal University Journal of Business and Management Sciences,* 4(2), 78-87.

Muhibbullah, M. & Das, M. R. (2019). The impact of inflation on the income inequality of Bangladesh: A time series analysis*. International Journal of Business and Technopreneurship,* 9(2), 141-50.

National Bureau of Statistics (NBS, 2018). Snapshot of Inequality in Nigeria (2004, 2013, 2016). Oxfam International May 2017.

Ohale, L. & Onyema, J. I. (2002). *Foundations of Macroeconomics*. Springfield Publishers, Nigeria.

Oxfam International May 2017.

Özdemir, O. (2020). The Impact of Inflation on Income Distribution: The Role of Bargaining Power. *İzlek Akademik Dergi (Izlek Academical Journal),* 3 (2), 56-64.

Park, C. Y. & Mercado, R. V. (2015). Financial Inclusion. Poverty, and Income Inequality in Developing Asia. *Adb Economics Working Paper Series No. 426.*

Piketty, T. (2014). Capital in the twentieth century. H. Koçak, Trans.) *Istanbul: Business/Work Bank of Türkiye) Cultural Publications.*

Umo, J. U. (2012). *Economics: An African Perspective 2nd Edition*. Millennium Text Publishers Limited Plot 6B, Block 22, Humanities Road, Unilag Estate, Magodo, Isheri, Lagos, Nigeria.

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Ünsal, E. M. (2010). *Mikro İktisat.* Anakara: İmaj Yayınevi.

Williamson, S. (2008). Monetary Policy and Distribution. *Journal of Monetary Economics*, 55(6), 1038-1053.

World Bank Data (Gini Index - Nigeria), 2018.

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