



Impact of Income Inequality on Poverty Level in Nigeria: Evidence from ARDL Model

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study used the Auto Regressive Distributed Lag (ARDL) model to assess the effect of income disparity on the degree of poverty in Nigeria. Based on the association each income determinant showed with the Gini coefficient of income disparity in the Nigerian economy, the study's findings indicated that there is a long-run positive relationship between the poverty level and the Gini coefficient of income inequality in Nigeria. Therefore, it is advised to improve a more equitable distribution of wealth, which will effectively lessen income inequality and poverty in Nigeria. The government should concentrate its efforts on developing and implementing more realistic employment programs in Nigeria. Since the empirical results of this study have demonstrated that decreasing income disparity in Nigeria by an increase in the employment rate has not been sufficient. A more practical approach to employment would allow people to use their money to build wealth rather than just get by, which would increase the level of income distribution.

Keywords: ARDL modeling; income inequality; poverty level.

JEL Classification Code: E6; A1

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1. INTRODUCTION

The Global and Shared Prosperity Index broadens the way we define and measure poverty [1]. There is widespread concern about global inequality and economic growth that the economic crisis has only widened the gap between the rich and the poor [2]. This has necessitated the need to examine the pattern of inequality in global and emerging countries. This has triggered a lot of concern to examine the multiple causes linked to growing income inequalities caused by globalization, technological change and changes in distribution policies. The Organization for Economic Cooperation and Development (OECD) has amassed a sizable body of research over time regarding the scope and causes of inequality, social mobility, and equal opportunity, as well as policy solutions to address these problems. According to this findings, the global society as a whole can benefit much from lowering inequality [3].

Income inequality and the level of poverty are critical indicators of economic development Silver, [4]; El Agri et al. [5]. Developed nations are those with reduced economic inequality and low rates of poverty, whereas underdeveloped or developing nations are those with highly skewed or uneven income inequality and high rates of poverty [6]. Because of the impact that growing income inequality has on the political, social, and economic stability of a country, income inequality and poverty have remained hot topics in both local and global debates Shaba, et al. [7]. This is also evident in the sustainable development goals of the United Nations, which call for, among others, the eradication of poverty and an increase in the income of the poorest 40% of developing nations. Additionally, the International Monetary Fund (IMF) highlighted the significance of income inequality as an important factor in economic growth [8].

There have been widespread worries that economic progress is not being equitably distributed throughout the World. Poverty and income inequality are two interrelated and mutually reinforcing developmental issues in Africa [9]. According to Oxfam [10], the continent continues to be plagued by entrenched poverty and alarmingly high and rising inequality. According to Chancel, Cobgeau, Gethin, and Myczkowski, [11], despite significant economic growth in many African nations, indexes of human development and poverty have not

advanced as anticipated, reviving interest in the study of inequality. It is centred on multidimensional poverty measures that are anchored on household consumption and the international poverty lines of 1.9 dollars per person a day but broaden the measures to include information on access to include education and basic infrastructures [12]. It also sheds more light on the poverty differences within households gender, and age. The weak poverty-alleviation elasticity of growth [13].

The 2019 poverty and inequality in Nigeria report was just released by the National Bureau of Statistics (NBS). According to the research, about 83 million people, or 40% of the total population, live below the nation's poverty threshold of 137,430 naira (\$381.75) each year. The NBS study is based on data from the most recent Nigerian Living Standard Survey, which was carried out between 2018 and 2019 with assistance from the NLSS program and the World Bank's global poverty programs. The Nigerian Living Standard Survey (NLSS) is the official survey that serves as the benchmark for assessing living conditions and poverty in the nation. It is also used to estimate a variety of socioeconomic indicators, including benchmarking for the SDGs. Ten years after the last round, the National Bureau of Statistics conducted the most recent NLSS between September 2018 and October 2019. Throughout the implementation, the World Bank offered technical assistance to the NBS and introduced a number of methodological advancements that made it possible to obtain trustworthy data for the poverty estimate (NBS, 2020).

The degree of inequality in Nigeria is rather severe. The paradox of growth in Nigeria is that while the nation becomes richer, only a select few gain while the majority continues to live in poverty and hardship, according to Oxfam, [14] and Magaji & Musa, [15]. According to Quartz Africa (2018), recent data shows that 86.9 million Nigerians, or about 50% of its estimated 180 million population, now live in extreme poverty, making the country multidimensionally poor. Nigeria was ranked 45th out of 45 countries in the Oxfam [10] report ranking African countries according to their commitment to addressing inequality, with the unenviable distinction of consistently coming in last place globally and in the African region.

Achieving inclusive growth is hampered by negative income disparity. Income disparity is

receiving more empirical attention as a result of the unfavourable environment it creates for growth. As a result, Yunqian, [16] argued that addressing poverty also necessitates policies to address inequality, asserting that it is conceivable to be worried about poverty while being indifferent to inequality. Therefore, the importance of being concerned about economic disparity cannot be overstated because it has a significant impact on poverty. This is because greater inequality will almost always imply greater levels of poverty for a given level of average income Azam et al. [17]. Similar to how rising levels of poverty will necessitate redistribution toward the poor, addressing the issue of pervasive income inequality will also require developing policies, which form the basis for this study, which covers the years 1980 to 2021.

The main problem with this study is that poverty still exists despite prior policy interventions like the national poverty eradication program, family economic advancement program, and family support program, among others, to achieve inclusive growth, which is defined by increased GDP reduction in inequality and, consequently, poverty. This calls for a critical assessment of how inequality affects poverty. The purpose of this study is to examine how income disparity affects the amount of poverty in Nigeria.

2. LITERATURE REVIEW

Kopp [18] defined income inequality as “an extreme disparity of income inequality with a high concentration of income usually in the hands of a small percentage of a population”. Therefore, there is a big difference in wealth between different demographic groups when there is income inequality. Income inequality and income disparity segregations can be assessed by a variety of segmentations, including occupation, historical income, male versus female, ethnicity, and geographic area (Musa and Magaji, [19]. Because different types of income inequality are examined using different segmentations of income disparity analysis, income inequalities by demographic segmentation serve as the basis for research on income inequality and disparity.

From a country's perspective, a variety of internal and foreign factors may influence income disparity [20]. One such significant external factor is globalization [21]. The relationship between income inequality, growth, and globalization has long drawn the attention of academics. However, the absence of a Globalization index has

prevented statistical estimation and testing of the relationship, with the exception of a partial view in studies like Magaji, Abubakar & Temitope, [22], which examined the relationship between inequality and the economic components (trade, FDI, and financial openness) of Globalization.

According to Chen, Catalano, and Williams [23] the term "poverty" refers to the situation or state in which individuals, groups, or communities lack the necessary means of subsistence. As a result, fundamental human needs are unmet. Families and individuals living in poverty may lack access to adequate housing, clean water, wholesome food, and medical care. Each country may have its own standards for establishing the poverty line and calculating the proportion of its population that lives in poverty. It's crucial to keep in mind that poverty is a social state caused by a variety of factors, not only income. These variables include, among others, color, sexual orientation, and sexual identity, as well as little or no access to education. On an individual or household level, poverty is both a personal worry and a larger social one. A variety of mental and physical problems might result from not being able to meet needs. A high poverty rate can have a negative impact on society as a whole and be linked to issues like crime, unemployment, urban deterioration, education, and ill health. To help people, families, and communities escape poverty, the government frequently implements socioeconomic welfare programs Chen et al [24]. Different nations have different welfare states (social safety nets). For instance, welfare programs in the United States tend to be far more individualistic and secure. In contrast, welfare programs and assistance for the needy are much more widespread in European nations. People who do not fit into a household with a specific income level are considered to be living in poverty, according to the Department of Health and Human Services (HHS). The percentage of the population that lives in poverty in the US is calculated by the U.S. Census Bureau. The poverty line in 2022 for a family of four with two children under the age of 18 is \$27,750 per year. According to Chen et al. [24], the poverty level for two people over 65 without a kid under the age of 18 will be \$18,310 per year in 2022.

Morduch and Sicular introduced a new regression-based method for breaking down inequality indices using household-level data. They also looked at the advantages and disadvantages of breaking down inequality by income source in comparison to how they are

typically interpreted. The method breaks down aggregate inequality indices using estimated income flows from variables in linear income equations. In a multivariate environment, the integrated approach offers an effective and adaptable way to measure the contributions of variables including education, age, infrastructure, and social status. The evidence from China indicates the benefits of the suggested, integrated method and highlights the stark disparities that might occur when using decomposition techniques with different features. The empirical findings highlight the role that spatial segmentations play in escalating inequality: in the sample, the village of residence greatly influences inequality. The relatively equitable distribution of human capital, especially demographic factors, acts as a partial counterbalance to this force. Affiliation with the communist party and indicators of social position, in contrast to previous recent studies, play a very small influence in explaining inequality. This also was done in rural China and not Nigeria.

However, Alayande [25] decomposed income inequality and poverty in Nigeria using the regression-based decomposition approach created by Morduch and Sicular (2018). She found that while the number of unemployed people in a household had a positive impact on income inequality, primary and postsecondary educational attainment was important in reducing it. This investigation focuses on unemployment in households and not on improved knowledge or effective labour.

Additionally, Jacobs (2020) discovered through empirical research that the percentage of total income disparity in Japan, Taiwan, and South Korea can be attributed to inequalities in age groups is relatively low (less than 5%). When compared to the mean of different age groups, inequality is significantly more common among people who fall into the same age category. In other words, neither of the three countries' wealth inequality nor a large portion of it can be attributed to age. Also, Nigeria was not included in this study.

Moreover, Adesimi [26] analyzed the structure of rural-urban income inequality vis-à-vis occupational groups and surveyed the four major states in the western part of the country that is, Lagos, Ogun, Ondo and Oyo States in Nigeria. To weigh and evaluate the rural and urban sectors of the economy, factors such as population, key economic activity, services, and

industrialization level were taken into consideration. He noted that in the three states of Oyo, Ondo, and Ogun for which data are available, the rural sector received 38.3% of the taxpayer's income.

Kennedy [27] used the Federal Government's Trader Moni Social Intervention Policy Programme to explore how governance affects income disparity and economic inequality in Nigeria. In order to assess the approach between 2018 and 2019, the study used content analysis. The execution of Trader Moni's social intervention policy was deemed to have fallen short of achieving its stated goal of income redistribution. According to the study, Africa's level of economic disparity is comparable to that of Latin America or India. It demonstrated the extreme inequality in southern and central Africa. Additionally, the within-country component accounts for the majority of the continent's income inequality, while the between-country component has marginally decreased over the past two decades as a result of faster growth in developing nations. Furthermore, except in southern Africa, inequality was comparatively consistent across the period. The duality between agriculture and other industries, including mining rents, was another significant factor in determining inequality. This was focused on the Federal Government social policy intervention programme which is different from the parameter used in this study.

Based on the literature reviewed, there appeared to be a gap specifically in the relationship between income inequality and poverty level in Nigeria. This study investigates the mechanism through which income inequality affects the poverty level such as low level of income. Also, this research is required to understand the real relationship between income inequality and poverty level so that governments at various levels should bring up policies that will break down the level of inequality in income distribution.

3. METHODOLOGY

3.1 Source and Analysis of Data

This study made use of secondary data from CBN (2011) and WDI (2022). The study examined data from 1980 to 2021 for its analysis.

The Autoregressive Distributed Bounds Test (ARDL) was used to accomplish the goals of this

investigation. The adoption of the ARDL technique suggested by Pesaran, Shin and Smith (2001) is the result of its advantages over traditional co-integration techniques when applied to small sample sizes, its ability to simultaneously test both short-run and long-run relationships while providing unbiased results, and the fact that it tests variables regardless of whether they are differences of order zero or order one.

3.2 Theoretical Framework and Model Specification

The social capital theory, which emphasizes that social connections are resources that can contribute to the growth and accumulation of human capital or not, forms the foundation of the study. The hypothesis is predicated on the idea that social interactions may make it easier for people to accrue benefits for themselves, whether they be financial or not. The impact of social ties, here represented by income disparity, on poverty, which symbolizes the condition of human capital, captures the theoretical relevance of the idea.

The research modified the Musa, Magaji, Eke and Yakeen [28] model. As a result, it models poverty (POVT) as a function of the unemployment rate (UNEMT), inflation rate (INFT) and Human Development Index (HDI). Equations [3.1] and [3.2] provide the functional and econometric forms of the model, respectively;

$$POV = f(UMP, POP, HDI) \dots \dots \dots (3.1)$$

This is shown in econometrics format:

$$POV = \beta_0 + \beta_1UMP + \beta_2POP + \beta_3HDI + Ut \dots \dots \dots (3.2)$$

Therefore, this study modified its model as

$$POVR = \beta_0 + \beta_1INQ + \beta_2UNEMP + \beta_3INFL + Ut \dots \dots \dots (3.3)$$

Where;

- POVR = Poverty Rate
- INQ = Income Inequality
- UNEMP = Unemployment
- INFL = Inflation

- $\beta_1, \beta_2, \beta_3$ and β_4 = Coefficient of the variables
- ut = Error term

3.3 A Priori Expectation

Economic a-priori will be examined to see if it complies with economic theory and is used to explain the sign and size of the parameters in the model as well as the movement of variables (independent and dependent variables) in the models.

The a-priori expectations are: $\beta_1 < 0$; $\beta_2 < 0$; $\beta_3 > 0$.

3.4 Estimation Technique

3.4.1 Stationarity test

The unit-root method, which uses an autoregressive model (ar process) with each variable regressed on its own lagged value without an intercept and a deterministic trend, will be used to test for stationarity. The ADF unit root test will be used to correct the erroneous term's autocorrelation. Model being used is:

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \sum_{i=1}^{m_i} \alpha_i \delta y_{t-i} + \epsilon_t \dots \dots \dots (3.4)$$

$\Delta = \rho - 1$

Where; y represents all the variables under consideration, δ represents the coefficient of the lagged value of y, δ is the first difference operator, y_{t-i} represents the lagged terms included, and ϵ_t represents the pure white noise error term.

3.4.2 Co-integration test

Pesaran (2001) performed the co-integration ARDL bound test. When the variables have distinct orders of integration, such as $i(0)$ and $i(1)$, the ARDL approach to co-integration is advised.

$$\Delta HORT = \alpha_0 + \sum_{mj=1} \alpha_1 j \Delta HORT-j + \sum_{mj=1} \alpha_2 j \Delta INFt-j + \sum_{mj=1} \alpha_3 j \Delta HPIt-j + \sum_{mj=1} \alpha_4 j \Delta PCIt-j + \sum_{mj=1} \alpha_5 j \Delta PHEt-j + \theta_1 HORT-1 + \theta_2 INFt-1 + \theta_3 HPIt-1 + \theta_4 PCIt-1 + \theta_5 PHEt-1 + \dots \dots \dots (3.5)$$

Based on the f-statistic, the co-integration relationship is tested. Regardless of whether the variables are $I(0)$ or $I(1)$, the asymptotic distribution of this f-statistic is non-standard, hence Narayan (2005) tabulated two sets of critical values that are suitable for investigations

analysis of the data set in economic decision-making and forecasting.

To protect our work from erroneous regression, the unit root is employed to determine the stationarity of the data. To confirm the data's stationarity, the Augmented Dicky Fuller (ADF) and Philip-Perron (PP) tests were both run. The ADF result demonstrated that poverty reduction (POVR) and inequality rate (INQ) are all stationary at the first difference (i(i)), while unemployment (UNEMP) and inflation rate (INFL) are stationary at a level i(0). Similar to this, the PP demonstrates that two variables, POV R and INQ, are stationary at the initial difference (i(i), whereas INFL and UNEMP are stationary at level i(0). We therefore have an admixture of i(0) and i(i), according to this.

The bound cointegration test result in Table 3 indicates that the null hypothesis of no cointegration is rejected since the f-statistic (4.902071) is bigger than both the lower bound i(0) and the upper bound i(i) at a 5% level of significance. This suggests that long-term cointegration exists. This indicates that the variables have a long-term association.

Table 3 showed the bound Cointegration test result to know if there is a long-run relationship among the variables.

Following representation and the Wald test, the outcome is summarized in the Table 5.

Table 5 displays the calculated bound cointegration test where f is greater than the Lower bound of 3.276 at a 5% level of

Table 1. Descriptive statistics

	UNEMP	POVR	INQ	INFL
Mean	51.53268	61.70927	8.293659	3.336585
Median	46.82000	63.10000	7.490000	3.600000
maximum	86.00000	71.30000	27.04000	33.70000
minimum	43.00000	52.99000	0.130000	-13.10000
std. Dev.	13.36866	6.012061	8.225641	7.199367
skewness	1.833326	-0.125972	0.643629	1.320395
kurtosis	4.689072	1.676194	2.166594	9.594182
jarque-bera	27.84121	3.102228	4.017313	86.19739
probability	0.000001	0.212012	0.134169	0.000000
Sum	2112.840	2530.080	340.0400	136.8000
sum sq. Dev.	7148.843	1445.795	2706.447	2073.235
Observation	36	36	36	36

Source: Author's Computation using E-view 10, (2023)

Table 2. Unit root test result

Variable	ADF			Philip-Perron		
	Level	1st difference	Order of integration	Level	1st difference	Order of integration
UNEMP	-2.657570*	-	I(0)	-2.635213*	-	I(0)
INFL	-	-	I(0)	-	-	I(0)
	5.168269***			5.161857***		
POVR	-1.410505	-5.846427	I(i)	-1.681904	-5.866561	I(i)
INQ	-1.311675	-7.196952	I(1)	-1.226905	-7.213212	I(1)

Source: Author's Computation Using E-view 10, (2023)

Table 3. Cointegration Test Result

F-bound test		Null hypothesis: no levels of relationship		
Test of statistic	Value	Signif. Level (n>35)	I(0)	I(i)
F-statistic	4.902071	10%	2.696	3.898
K	4	5%	3.276	4.630
		1%	4.590	6.368

Source: Author's Computation Using E-view 10, (2023)

Table 4. Result Estimation

ARDL error correction regression				
Dependent variable: d(POVR)				
Selected model: ARDL(4, 3, 2, 3, 3)				
Case 3: unrestricted constant and no trend				
Date: 04/16/23 Time: 10:47				
Sample: 1980 2021				
Included observations: 41				
ECM Regression				
Case 3: Unrestricted Constant and no Trend				
Variable	Coefficient	Std. Error	T-statistic	Prob.
C	-84.86843	14.94118	-5.680168	0.0001
D(POVR)	0.450157	0.510779	0.881314	0.3942
D(POVR(-1))	-1.073818	0.515711	-2.082210	0.0576
D(POVR(-2))	1.828434	0.483340	3.782918	0.0023
D(UNEMP(-1))	-0.409705	0.150781	-2.717221	0.0176
D(EMPG(-2))	1.043869	0.282757	3.691756	0.0027
D(UNEMP(-3))	-0.415720	0.211412	-1.966396	0.0710
D(INQ)	0.896643	0.338269	2.650680	0.0200
D(INQ(-1))	3.349744	0.799710	4.188696	0.0011
D(INFL)	0.896847	0.221406	4.050694	0.0014
D(INFL(-1))	-1.131064	0.244261	-4.630549	0.0005
D(INFL(-2))	-0.752560	0.168948	-4.454382	0.0006
Cointeq(-1)*	-0.165567	0.029245	-5.661449	0.0001
R-squared	0.768909	mean dependent var		-0.385758
Adjusted R-Squared	0.565006	s.d. dependent var		7.552471
S.E. of Regression	4.981164	Akaike info criterion		6.355607
Sum Squared Resid	421.8040	Schwarz criterion		7.081187
Log-Likelihood	-88.86752	Hannan-Quinn criteria.		6.599743
F-Statistic	3.770945	Durbin-Watson stat		2.321042
Prob(F-Statistic)	0.005155			

* p-value incompatible with t-bounds distribution.

significance and lies above the upper level of the bound critical value (4.90 > 4.630). This suggests that the variables' long-term cointegration. The coefficient of 0.165567 ECM result, on the other hand, indicates a long-term average 17% speed of adjustment back to the long-term equilibrium level. A unit increase in unemployment causes a 98% increase in the poverty rate, showing a positive relationship between poverty and unemployment. This outcome was consistent with earlier study, which found a strong and favorable correlation between SMEs, job creation, poverty reduction, and living standards in Nigeria.

In previous researches, an increase in employees' earnings will boost their purchasing power and hence their standard of living, thereby reducing the rate of poverty in Nigeria. Additionally, a unit adjustment in the INFL rate will result in an increase in poverty of nearly 150% in Nigeria. In 2021, the Nigerian economy,

which has double-digit inflation and a high poverty rate of 33.3% due to a sharp fall in GDP growth, reflects this outcome. The outcome demonstrates that poverty rate and income disparity have a negative and significant association. Accordingly, a unit change in inequality causes the poverty rate to decrease by approximately 148%.

4.2 Causality Test

This study aims to determine the impact of income inequality on the poverty level in Nigeria. In other words, is it income inequality that causes poverty in Nigeria? To do this, the Granger Causality Test was carried out between income inequality and poverty level in Nigeria. The expectation was that using Granger Causality Test, variable under consideration does not Granger Cause the other. The results of the Granger Causality is reported in Table 6.

Please note: The aforementioned Granger causality results are simply intended to demonstrate the causal relationships between the explanatory and endogenous variables.

The findings of the Granger causality test between income and the rate of poverty in Nigeria are displayed in Table 6. It is useful to note that while the cointegration test conducted earlier showed that there was a long-term relationship between variables, it provided no information regarding the direction of the causal relationship. We are able to determine the Granger causality's direction by applying the Granger causality test. According to the Granger causality approach, causation is present if the related probability value makes the f-statistic statistically significant. As a result, causality is demonstrated in this study up to a 5% level.

The findings in Table 6 showed that there is no causal relationship between the rate of poverty and income inequality. This indicates that there is no causal relationship between the key research variables and the dependent variables.

4.3 Serial Correlation Test

A diagnostic test called the Lagrange multiple (lm) test is used to determine whether serial correlation exists or not in order to shield the model from inaccurate results.

Since the f-statistic and obs*r-square with p-values of 0.54 and 0.45 are greater than the critical values at 5% level of significance, Table 7 demonstrates that the values of 0.64 and 1.62 with respective p-values of 0.54 and 0.45 indicate the absence of autocorrelation in the model. As a result, we may say that the model does not contain any autocorrelation.

4.4 Heteroscedasticity Test

This test is designed to determine whether or not error term variability is constant. Heteroscedasticity indicates that the residuals are unstable and may have an impact on the inferences.

Table 5. Summary of the ARDL Result

ECM regression			
Case 3: unrestricted constant and no trend			
Variable	Coefficient	S.E	P-Value
UNEMP	0.834433	0.83443	0.0004
POVR _{T-1}	0.977535	0.604112	0.1296
INQ	-1.487908	0.612780	0.0304
INFL	1.503575	0.715992	0.0558
ECM(-1)	-0.165567	0.029245	0.0001

Table 6. Granger Causality results

Pairwise Granger causality tests			
Date: 04/16/23 Time: 16:53			
Sample: 1980 2021			
Lags: 2			
Granger Causality	Obs	F-statistic	Prob.
POVR does not granger cause INFL	37	0.18190	0.8345
INFL does not granger cause POVR		0.46263	0.6338
UNEMP does not granger cause INFL	37	1.95737	0.1578
INFL does not granger cause UNEMP		1.13967	0.3326
INQ does not granger cause POVR	37	0.26232	0.7709
POVR does not granger cause INQ		0.19119	0.8269
UNEMP does not granger cause INQ	37	0.14230	0.8679
INQ does not granger cause UNEMP		1.15954	0.3265

*Nb: * means rejection of the null hypothesis of non-granger causality.*

Source: Author's Computation, E-views, 10.0, 2023

Table 7. Breusch-godfrey serial correlation Im test

Breusch-Godfrey Serial Correlation Im Test:			
F-statistic	0.637390	prob. F(2, 20)	0.5391
Obs*r-squared	1.617833	prob. Chi-square(2)	0.4452

Source: Authors Computation Using E-views, 10.0, 2023

Table 8. Heteroskedasticity test: Breusch-pagan-godfrey

F-statistic	1.181472	prob. F(4,22)	0.3463
Obs*r-squared	4.774357	prob. Chi-square(4)	0.3112
Scaled Explained ss	2.398449	prob. Chi-square(4)	0.6629

Source: Authors Computation Using E-views, 10.0, 2023

Table 9. Ramsey reset test

Equation: untitled
 Specification: POVR UNEMP POVT_{T-1} INQ INFL
 Omitted variables: squares of fitted values

	Value	Df	Probability
T-statistic	2.075822	21	0.0504
F-statistic	4.309036	(1, 21)	0.0504
Likelihood ratio	5.039254	1	0.0248

Source: Authors Computation Using E-views, 10.0, 2023

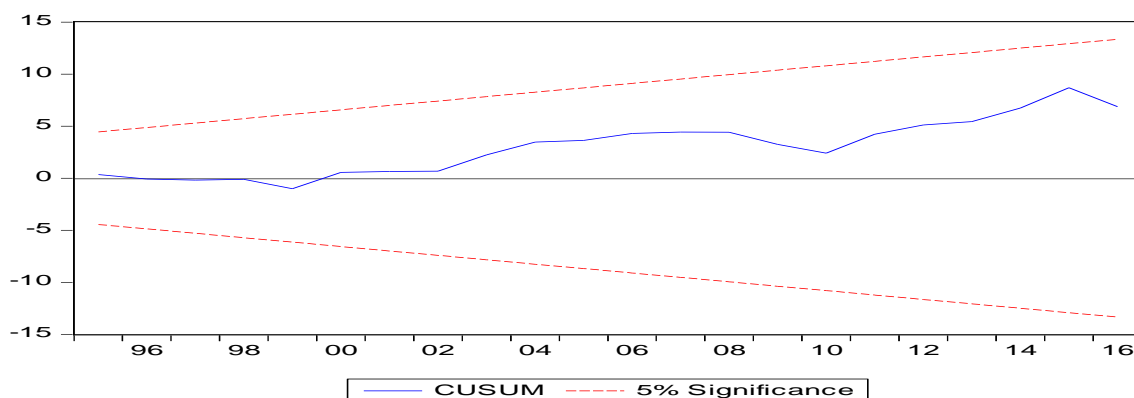


Fig. 1. Cumulative Sum (Cusum)

Source: Authors Computation Using E-views, 10.0, 2023

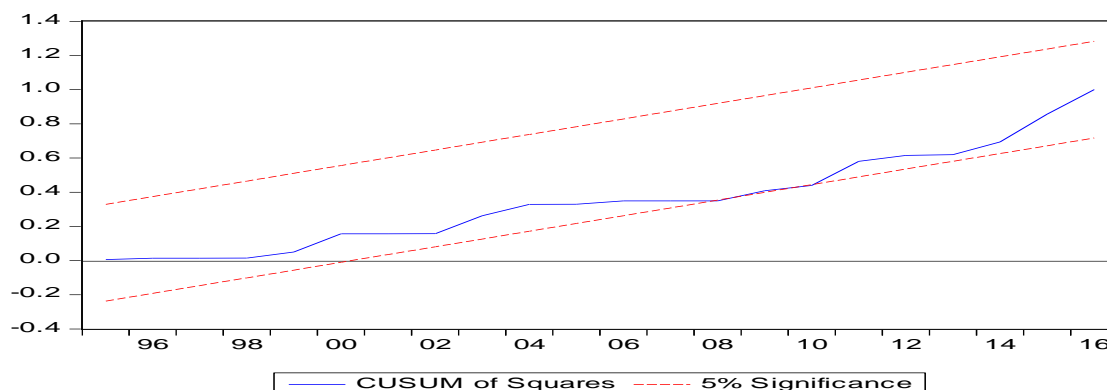


Fig. 2. cumulative sum of squares (Cusumsq)

Source: Authors Computation Using E-views, 10, 2023

Table 8 demonstrates that the values of 1.18 and 4.77 for the f-statistic and obs*r-square, respectively, with p-values of 0.35 and 0.31, indicate that there is no heteroskedasticity in the model because these values are higher than the critical values at the 1% level of significance. As a result, we may say that the model does not contain any heteroskedasticity.

4.5 Ramsey Reset Test

A general specification test for the linear regression model is the Ramsey regression equation specification error test (reset) in statistics. It especially examines if the fitted values' non-linear combinations can be used to further the explanation of the response variables.

The f-statistic of 4.409036 with a p-value of 0.0504 in Table 9 demonstrates that the model is appropriately described because it exceeds the critical values at the $p > 0.05$ level of significance. We can draw the conclusion that the model was correctly specified and that there was no misspecification.

4.6 Stability Tests

The stability of the long-run coefficients alone with the short-run dynamics is tested using the cumulative sum (cusum) and cumulative sum of squares (cusumsq).

Graphic representations of Cusum and Cusumsq are presented in Figs. 1 and 2. Due to the fact that the plots of both the Cusum and the Cusumsq are contained inside the borders, the statistics show the stability of the long-run coefficients of the repressors that hinder inclusive growth in Nigeria. The model appears to be stable and well-described given that none of the two test statistics vary from the bounds of the 5% level of significance.

5. CONCLUSION

In light of the data and outcomes of this investigation, the following logical, sequential conclusions are drawn:

The Gini coefficient of income inequality in Nigeria and the employment rate have a long-term positive association. In other words, the employment rate widens the income gap in Nigeria. Since inflation expands the gap between the rich and the poor, there is a long-term

positive relationship between the inflation rate and the Gini coefficient of income inequality in Nigeria. The junior workers' purchasing power is also decreased by the inflation rate, exacerbating the income disparity in Nigeria. The Gini coefficient of income inequality in Nigeria has a long-term, inverse relationship with inequality. The rate of poverty rises when there is income inequality. This is based on the idea that the high poverty rate is caused by the fact that a sizable share of money (about 3%) is concentrated in a small number of people. The study came to the further conclusion that the true causes of income disparity in Nigeria are the employment rate, inflation rate, and inequality. The existence of the long-run relationship between income inequality and its determinants is further supported by a negative coefficient of the over-parameterized ECM, which demonstrates that changes in the Gini coefficient of income inequality depend on changes in all the variables as well as on the equilibrium error term.

The following suggestions are made to improve a more evenly distributed income, which would in turn reduce income gaps and poverty in Nigeria, based on the empirical findings in this research work and the relationship each determinant of income displayed with the Gini coefficient of income inequality in Nigeria's economy. The government should concentrate its efforts on developing and implementing more realistic employment programs in Nigeria. Since the empirical results of this study have demonstrated that decreasing income disparity in Nigeria by an increase in the employment rate has not been sufficient. A more practical approach to employment would allow people to use their money to build wealth rather than just get by, which would increase the level of income distribution. A program to lower the current inflation rate of two digits to one digit must be prioritized if the Nigerian government's efforts to improve wages are to have more positive effects. A significant rate of inflation would contribute to raising the real worth of income in workers' hands, especially low-income earners, and help narrow the wealth gap. Our empirical research showed that the income disparity in Nigeria worsens when the inflation rate increases. Therefore, simultaneous wage rise policies and those that limit the rate of inflation growth should be given greater attention in Nigeria. To help people out of poverty, development strategies that address severe and pervasive income inequality must be put in place in addition to higher growth rates. Better distribution of human

capital, well-targeted social protection, better distribution of socioeconomic amenities like roads, electricity, schools, and hospitals, more progressive taxation, implementation of the increased minimum wage, and a set of policies intended to promote a more equitable distribution of income are some examples of such policies. In Nigeria, priority should be given to ensuring that all people have access to education and the associated income-generating opportunities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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