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Article

Does economic growth, external debt, and institutional quality promote poverty and income inequality in Nigeria?

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Abstract: The United Nations sustainable development goal 10 (SDG10) aims to reduce inequality and by extension poverty within and between countries. However, issues of economic growth, external borrowing, and institutional quality could clog efforts at realising SDG10, particularly in a developing country. Thus, this study assessed the effect of economic growth, foreign debt, and institutional quality on poverty and income inequality in Nigeria between 1990 and 2022. The research applied the autoregressive distributed lag (ARDL) technique in its empirical analysis. Findings from the study indicated that economic prosperity does not have significant long-run impact on poverty and inequality. However, the short-run relationship showed that economic growth increases inequality in Nigeria. Foreign borrowing was revealed to further aggravate poverty and inequality in the long-run. Also, while government effectiveness demonstrated an enhancing effect on poverty in the short and long-run periods, its long-run impact on inequality is significantly decelerating. Thus, based on the aforesaid conclusions the study recommends the strengthening of small and medium enterprises through access to finance at lower interest rates and equitable distribution of national wealth through the payment of a living wage, provision of social and economic infrastructure, etc. Also, the agricultural sector should be made more attractive to the youths through encouraging export promotion policies. Leveraging financial technology, and encouraging start-up firms can further reduce the poverty and the inequality level in the country.

Keywords: poverty; income inequality; economic prosperity; government effectiveness; foreign debt; Nigeria
JEL Classification: D31; H53; I3

1. Introduction

Poverty has been a serious concern for most developing economies, including Nigeria since the turn of the 21th century. Conceptualising poverty extends beyond mere lack of income and productive resources, essential for the sustainability of livelihoods. It encompasses issues of well-being including malnutrition, hunger, inadequate access to education and other elementary services, social isolation and exclusion, and lack of involvement in decision-making process [1]. Nigeria is blessed with abundant natural resources and human capital, but many of its population live below the poverty line and survive on less than $1.9 per day. Poverty in Nigeria is rising with almost 85 million of its population living in less than 1.9 per day [2]. The National Bureau of Statistics [3] noted that the number of poor Nigerians increased by 24 million between 2018 and 2023, despite its economy being the largest in Africa. Furthermore, the percentage of Nigerians living in absolute poverty increase each day, that is, those who cannot afford the basic essential foods, shelter and clothing is 40 percent of the total population, or almost 83 million [4,5]. Consequently, Nigeria is ranked 61st in the world on the United Nations human development index due to the growing incidence of poverty which is pervasive in the country [6].

Furthermore, income inequality is a major economic problem in the country. Inequality refers to disparities and discrepancies in areas such as social identity, income, education, health, nutrition, space, politics, outcomes, and opportunities [7]. As with poverty, measurement of inequality has tended to focus on income, while progress on inequalities is uneven [8]. In recent years' income inequality globally and within many countries has decreased, but in some countries, it has risen [9,10]. In developing nations where decline in income inequality has been experienced the success is often attributed to the expansion of education and public transfers to the poor [11]. Nevertheless, inequalities between marginalized groups and the rest of the population have persisted in such developing economies including Nigeria [12].

Income inequality affects the pace at which economic growth enables poverty reduction [13]. Reducing inequality within countries has been 10th objective of the United Nations sustainable development goal (SDG10) in recent years. It is believed that reducing inequality will assist in eradicating other socioeconomic problems in developing nations [9,10]. Income inequality is created when the gap between the rich and the people living in poverty gets expanded. Higher levels of poverty and income inequality are detrimental to people's opportunity, quality of growth, and security [14,15]. Baumol and Blinder [16] states that the causes of income inequality could be differences in abilities because people have different capabilities. Hence, it should not be surprising that some people are more adept at earning income. Intuitively, it is clear that some types of inventiveness are richly rewarded by the market. The same is true of the elusive characteristic called entrepreneurial ability and differences in the intensity of work. Some people work longer hours than others or labour more intensely when they are on the job. Ability in risk-taking, luck, inherited wealth, schooling, and other types of training has also resulted in certain income differences that are largely voluntary.

The effects of economic growth on poverty and income inequality are not yet defined by empirical studies. Extant researches have established two unique stands on the association between income inequality and economic growth. Some scholars stressed that economic growth either diminishes or has no impact on income inequality and poverty [17]. Other researches emphasized that economic growth aggravates income inequalities and poverty due to the lopsided distribution in the gains of economic growth among members of the society at which few individuals get large share of economic growth at the expenses of the larger proportion of the society [18–20]. Thus, empirical studies on the impact of poverty and income inequality on economic growth have been yielding mixed results. In addition, Delbianco et al. [21] noted that the relationship between income inequality and economic growth depends on income level of the country. Available data on Nigeria suggests that the growth rate of the country has not been stable overtime; however, the extent of the influence of economic growth on the level of income inequality remained uncertain owing to the limited empirical studies on the issue [22].

External debt is another key element that might contribute to increased income disparity and poverty in Nigeria. In mid-1986, the Nigerian government implemented the Structural Adjustment Programme (SAP), which resulted in considerable deficit financing during the recession (1986–1990). To pay the shortfalls, the government intensified its dependence of external borrowing. To make matters worse, the country's external debt-to-export of goods and services ratio soared to 772.2% in 1986, up from 47.4% in 1980 [23]. This means that by 1986, Nigeria demanded in excess of seven times the value that it obtained in export profits for repayment of its debt. As a result, the 1980–1990 period was the most challenging in Nigeria's debt management history.

Nigeria's significant foreign indebtedness persisted throughout the 1990s and into the mid-2000s, reaching levels that were unsustainable as a consequence, by 2005, the country was among the most indebted in the world. This spurred the federal government, led by President Olusegun Obasanjo, to seek a 'debt buy back' structure from Nigeria's largest creditors, the London and Paris Clubs, in 2005. The contract was later reached and executed in 2006. Thus, Nigeria was given the option of 'purchasing back' around $30 billion of her $32.6 billion external debt for a payment of $12.4 billion [24]. Despite the 2006 debt relief provided to Nigeria by the London and Paris Club of Creditors, the country's external debt has once again began ascending to dangerous heights. There are a number of reasons that contribute to such growth, including governance concerns and capital flight [25,26], as well as macroeconomic factors [27–29].

Another important culprit for the rising poverty and income inequality gap in Nigeria is the quality of government institutions. Institutional quality represents a gauge of the quality of a nation's governance and establishments regarding the calibre of contract enforcement, shareholder's protection, and property rights [30]. Institutional quality is a critical ingredient in any country's quest to achieve the United Nations (UN) sustainable development goals (SDGs), including enhancing peaceful communities, ensuring equal accessibility to justice and guarantying effective institutions [30]. Hence, poor financial management and allegations of public corruption might render the public sector's intervention in poverty and income inequality programmes ineffective. Furthermore, weak institutions have contributed to the elevated debt profile in Nigeria. As a result, the country's budget deficits have likewise continued to grow as a result of the need to service debts, and tackle poverty and inequality scourges. Hence, the weakness in government's effectiveness has encouraged the growing income disparity and exacerbated the challenge of multidimensional poverty in the country [2]. Different poverty alleviation initiatives by the government are often levelled with allegations of inefficiency and mirage results by the citizen. Thus, since the UNSDG goal 10 aims to reduce inequality and by extension poverty within and between countries; this study answered the query whether the failure to harness the benefits of economic growth, external borrowing, and institutional quality are actually clogging efforts at realising SDG10, particularly in a developing country like Nigeria.

Consequently, this research investigates whether economic growth, external borrowing, and institutional quality fuels the rise in poverty and income inequality between 1990 and 2022 for Nigeria. Extant studies have tried establishing impacts of income disparity and poverty on economic growth and vis versa [17,20,31–33]. Likewise, there are studies that have evaluated the public debt-inequality nexus [34–

39]. However, to the best of our knowledge, Nguyen [19] was the only close prior research to have tried examining the effects of public borrowing, institutional quality, and economic prosperity on income inequality, nevertheless, the study was for 30 advanced economies. Accordingly, this study bridges this empirical gap by examining whether economic growth, foreign debt, and institutional quality has been aiding the rise in poverty and income inequality for a developing country. Thus, this research leads in reversing the order of effects from economic growth, foreign debt, and institutional quality on poverty and income inequality for a developing economy, and specifically for Nigeria, extending the literature on this front.

The rest of this research structure reveals Section 2 to contain the reviewed literature; Section 3 the study's data and methodology; Section 4 findings and discussion; and Section 5 the concluding remarks.

2. Literature review

2.1. Theoretical review

Without doubt, the development and the distribution of income have been two of the most important policy objectives for almost every country in the world. Likewise, the relationship between the extent of income distribution and the level of economic growth has been the focus of many theoretical and empirical studies in the past decades. The Kuznets and New-Keynesian hypotheses formed the theoretical basis for this study. The Kuznet [40] hypothesis explained the link between income inequality and economic growth as inverted U shaped. Specifically, Kuznets argues that the distribution of income first worsens and then improves as a country develops. Stated differently, the Kuznet hypothesis noted that at the earlier stages of economic growth, inequality in income increases, as the economy grows further; inequality reaches its peak and then finally declines with continuous economic growth. Thus, the Kuznet hypothesis noted that in the short run there exist a positive relationship between income inequality and economic growth while in the long the relationship between income inequality and economic growth is negative.

On the other hand, the New-Keynesian theory adopts a money-center approach towards poverty; hence, the need for government intervention in the economy. The theory noted the role of excessive inflation, high sovereign debt and asset bubbles as other macro-economic factors, besides week aggregate demand believed to cause poverty [41]. Even though the New-Keynesian school followed a money-centered individual stance towards poverty, the importance assigned to the functions of the government allows for a greater focus on public goods and inequality. For instance, a more equal income distribution can facilitate the participation of disadvantaged groups of society in the type of activities that are deemed essential under broader notions of poverty.

Furthermore, the New-Keynesian premise hold the view that publicly provided capital (including education) has an important role to play with physical and human capital believed to be the foundation for economic prosperity. Unlike the classical approach, unemployment, viewed as a major cause of poverty, is largely seen as involuntary and in need of government intervention to combat it. The New-Keynesian theory stresses on the role of government in stimulating macro level variable such as aggregate investment, unemployment, inflation, debt and assets market bubbles to enhance growth and address issues of poverty (Jung and Smith, 2007), Moreover, according to this theorist, poor capital (human and physical), poor infrastructure, lack of suitable institution is considered as the main source of underdevelopment leading to poverty [42,43].

2.2. Empirical review

Failed economic growth of many countries which lead to reduce income and human poverty**:** It needs to be pointed out however, that while economic growth does contribute to poverty reduction there are still losers from the adjustments that growth requires. Moreover, economic growth explains only about half of poverty reduction. The rest depends on good policy to harness the growth poverty reduction. In many countries growth failed to reduce poverty, either because growth had been too slow or stagnant or because its quality and structure has been insufficiently pro-poor [44].

Bridging the gap between people living in poverty and the rich is very essential to the growth of the society by encouraging the people living in poverty to participate in pro-poor activities which will help them to reduce the gap between the rich and the poor [45]. One of the effects of unequal distribution of income and wealth in the country is that it will result in poverty, which is reflected in low consumption levels, low per capita income, and low standard of living of the mass of the people, despite more than two decades of development planning, hunger, malnourishment and suffering from the chronic and debilitating disease are still the bane of the majority of the population in India [46]. The elimination of widespread poverty and even high growing income inequality are the core of all development problems and define for many people the principal objective of development policy. Inequality is a challenge to the eradication of extreme poverty and tends to reduce the pace and durability of growth [47,48].

Ben [18] used trends tables and graphical illustrations to analyse the economic growth-inequality-poverty relationship in Nigeria from (1982–2006). Empirically, the research tested for the growth-inequality-poverty nexus in the Nigeria context. By using two level of analysis, first, a simple correlation analysis in which the correlation between growth and poverty was done; followed by an estimation of growth elasticity of poverty. Findings from the study showed that despite the economy's strong growth performance, poverty incidence has remained high as well as income inequality. Breunig and Majeed [31] in their research they used panel data for 152 countries for which have income inequality and gross domestic product data, only 5 years from 1956–2011 was sample with simplest growth regression on inequality, poverty and economic growth has highlighted a negative impact of inequality on economic growth, especially in countries with high poverty.

Okafor [17] examined the existing relationship among economic growth, poverty and income inequality in Nigeria. Using the Vector Auto-regressive (VAR) model and the Engle-Granger technique to test for the causality existing among the variables, the results revealed that economic growth had no impact on poverty reduction and income distribution in Nigeria due its non-inclusive nature. There was, however, evidence of a unidirectional causality, running from income inequality to increased poverty. This implied that inequality would lead to increase in poverty in Nigeria. Therefore, the paper recommended that government should develop stronger economic institutions that are capable of reorganizing the productive base and reward system in the economy so as to promote and guarantee economic efficiency, equity and macroeconomic stability and inclusive growth.

Onwuka [49] empirically examined the relationship between poverty, income inequality and economic growth in Nigeria. The study findings revealed that income inequality has a negative relationship with economic growth. Furthermore, poverty and income inequality were demonstrated to exert an insignificant effect on economic growth in Nigeria. Thus, the study concluded that poverty and income inequality have no significant relationship with economic growth in Nigeria. A similar study by Carrera and De la Vaga [36] examined the effect of income inequality on government borrowing for 158 economies. The applied various panel data techniques and found that inequality Granger-causes government debt. It was further revealed by the study that a rise in inequality is usually followed by an increase in public debt in the studied countries. In contrast, Biglaiser and McGauvran [35] showed the association between debt restructuring and income inequality in 71 developing economies. Their findings revealed that countries engaging in debt restructurings are likely to deploy their acquired economic flexibility to lower social expenditure and taxes, aggravating income inequality.

Also, Jin and Hong [50] demonstrated that the more income an individual receives the better the quality of human live and happiness enjoyed. Likewise, Severino et al. [51] revealed in their study an unequal concentration of QoL associated to uneven income levels in Chile. Inequalities have also been found to hinder social cohesion and increase the risk of violent conflict [12]. Inequality undermines social justice and human rights. Inequalities have resulted in the poorest people–including many women, young and older people, persons with disabilities, indigenous peoples, and rural populations making less progress towards development goals [52,53]. Economic, political, and social inequalities tend to reproduce themselves over time and across generations [54]. There is some overlap between those affected by poverty and those negatively affected by inequality, although it is important to note that certain groups and individuals are disproportionally affected. Deprivation or inequality in one dimension can influence other dimensions: for example, social inequality can lead to economic inequality [52]. It is important to understand the drivers of poverty and inequality to combat them effectively.

In the study by Seher [32], the effect of income inequality on economic growth is realized through transmission channel theoretically expressed. The analysis used panel data econometrics techniques in which 143 countries were divided into two groups by considering their income levels for the period between 1980 and 2017 through positive and negative channels. The study found out that high inequality adversely affects economic growth. However, the study noted that inequality in the absence of poverty does not appear to have a statistically significant effect on economic growth. Thus, as poverty increase, the effect of poverty inequality on economic growth become negative and statistically significant. Furthermore, Obiero and Topuz [39] in their study determined the impact of public and domestic indebtedness on income inequality for Kenya. By applying the ARDL method, the study submitted that both domestic and public borrowing are detrimental to income inequality in the long-run for Kenya.

In a study for Vietnam, Zhu et al. [33] demonstrated that poverty and inequality significantly and negatively impacted economic growth for the country. Specifically, the effect was found to be severe among the highly poverty prone population of the country. Nguyen [19] employed the system-generalised method of moments (GMM) and panel mean group (PMG) techniques to determine the effect of public debt, institutional quality, and economic growth on income inequality in 30 developed countries. Result from the research revealed that while government borrowing and institutional quality reduces income inequality, economic growth widens it. In another study, Okere et al. [20] noted that drivers of poverty include shocks; lack of inclusive economic growth and jobs; insecure jobs and low wages; limited opportunities; low capabilities; inequality; poor governance; weak civil society; lack of respect for human rights; climate change; the global recession; violent conflict and displacement; and an individual's human capital, physical and social assets, and behaviour.

Andoh et al. [34] tried to determine the level at which public indebtedness elevates inequality in African countries, hence estimating a debt-inequality threshold. The outcome of the study showed that government debt promotes inequality, and the impact doubles when public borrowing hits 57.47%. While tax burden was found to aggravate the effect of public debt on inequality, control of corruption actually lessens it for the 38 African economies examined. Similarly, Mutascu et al. [37] used the Bayesian model averaging technique to examine the effect of public debt on inequality different SSA economies. The study expressed that government debt actually lowered inequality among the poor, while harming the wealthy in the WAEMU region. Furthermore, the research observed that public borrowing was neutral on inequality in EMCCA countries but could aid income redistribution under strict corruption control.

Also, Nguyen [38] tried to analyse the nexus between public debt and inequality in developing and developed countries. By applying the GMM estimation approach, the study demonstrated that while government borrowing deflates inequality in advanced economies, it widens same in developing economies. In contrast, the study expressed that economic prosperity widens inequality in advanced countries but reduces it in developing nations.

In summary, the above empirical researches have examined the effects of income inequality and poverty on economic growth, the nexus between poverty and income inequality, public debt, economic growth and income inequality. Seldom are their researches that investigated the simultaneous impacts of external debt, institutional quality, and economic prosperity on poverty and income inequality, particularly for developing economies. Nguyen 19] was the only close empirical study to have tried determining the impacts of public borrowing, institutional quality, and economic prosperity on income inequality, however, the study was for 30 advanced economies. Accordingly, this study bridges this empirical gap by examining whether economic growth, foreign debt, and institutional quality has been aiding the rise in poverty and income inequality for a developing country. Thus, this research extends the literature on the determinant of poverty and income inequality in Nigeria.

The empirical lacuna in extant studies have shown that studies examining the effect of economic prosperity, foreign indebtedness, and institutional quality on poverty and inequality gap, particularly for Nigeria are scant. Thus, this research fills this lacuna in the literature.

3. Data and Methodology

3.1. Data

Represented in **Table 1** is the list of variables, and their measurement used for empirical analysis in the study. This data consisted of annual series sourced from 1990 to 2022 for Nigeria. Two dependent variables comprising poverty and inequality were used in the study. To measure for economic growth, the study applied the gross domestic product (GDP) per capita measure. This measure is preferred to conventional GDP indicator since it captures the individual contribution of the population to the growth of the economy [55,56].

Table 1. Variable description.

Variable	Measurement	Sources	Symbol
Poverty	Poverty gap index	World Bank Poverty and Inequality Platform (2023)	PGI
Inequality	Gini coefficient	WDI (2023)	INQ
Economic growth	GDP per capita growth rate	WDI (2023)	GDP
External debt	Total external debt in US$ million	WDI (2023)	EDGDP
Institutional control	Government effectiveness	WGI (2023)	GOVEF

Source: authors' computation.

Furthermore, the Nigerian government often anchor the need for foreign borrowing on poverty and income inequality reduction programmes, hence; external debt constitutes a crucial economic variable [57]. The persistent demand for imported goods in the economy, has had the government relying on foreign borrowing for finance [58]. For instance, as a means of bridging the poverty and income inequality gap, the Federal Government had been solely responsible for the payment of subsidies on imported petroleum products, electricity, and fertilizers for over two decades. Also, institutional control and its significance to reducing the level of poverty and inequality cannot be overemphasized. A weak institution is believed could promote the growth of inequality and widen the poverty gap in any society, especially when the government's policies at combating both ills are ineffective.

3.2. Methodology

In order to specifically fulfill the objective of this research, the responses of poverty and income inequality to economic growth, foreign debt, and institutional quality are disengaged into two equations:

$$PGI_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 EDGDP_t + \alpha_3 GOVEF_t + \mu_{t1} \tag{1}$$

$$INQ_t = \beta_0 + \beta_1 GDP_t + \beta_2 EDGDP_t + \beta_3 GOVEF_t + \mu_{t2} \tag{2}$$

In the event that the Equations (1) and (2) are estimated directly by means of Ordinary Least Square (OLS), the likelihood of a bias or spurious estimates is very significant given that the variables were specified in their non-stationary form [59,60].

Thus, pretesting for unit root or stationarity to determine the order of integration of variables is imperative. In light of the above, this research adopted the Auto Regressive Distributive Lag (ARDL) bounds technique developed by Pesaran et al. [61]. The justification for the selection of this approach is based on its certain econometric advantages in comparison to other single cointegration procedures. Furthermore, the technique permits testing for the presence of a long-run association between variables, irrespective of their order of integration; which could either be purely I(0) or purely I(1), or a combination of both, but definitely not I(2). Likewise, endogeneity problems and inability to test hypotheses on the estimated coefficients in the long run associated with the Engle-Granger [62] method is prevented. Therefore, the ARDL specifications for Equation 1 and 2 is given as:

$$\Delta PGI_t = \alpha_0 + \alpha_1 PGI_{t-1} + \alpha_2 GDP_{t-1} + \alpha_3 EDGDP_{t-1} + \alpha_4 GOVEF_{t-1} + \sum_{j=1}^{p} \pi_{i1} \Delta PGI_{t-j} + \sum_{j=0}^{p} \sigma_{i1} \Delta GDP_{t-j} + \sum_{j=0}^{p} \tau_{i1} \Delta EDGDP_{t-j} + \sum_{j=0}^{p} \delta_{i1} \Delta GOVEF_{t-j} + \emptyset_1 ecm_{t-1} + \varepsilon_{t1} \tag{3}$$

$$\Delta INQ_t = \beta_0 + \beta_1 INQ_{t-1} + \beta_2 GDP_{t-1} + \beta_3 EDGDP_{t-1} + \beta_4 GOVEF_{t-1} + \sum_{j=1}^{p} \pi_{i2} \Delta INQ_{t-j} + \sum_{j=0}^{p} \sigma_{i2} \Delta GDP_{t-j} + \sum_{j=0}^{p} \tau_{i2} \Delta EDGDP_{t-j} + \sum_{j=0}^{p} \delta_{i2} \Delta GOVEF_{t-j} + \emptyset_2 ecm_{t-1} + \varepsilon_{t2} \ (Equ.4) \tag{4}$$

where the error correction mechanism (ECM) is the speed of adjustment coefficient, showing the time it takes the economy to correct from short-term distortion to long-term equilibrium.

4. Results and discussion of findings

4.1. Descriptive and correlation analyses

Contained in **Table 2** is the descriptive statistics for the study variables. The mean PGI for the study is revealed as 17.7, indicating that the prevalence of poverty between 1990 and 2022 has not been severe. However, the inequality measure (Gini coefficient) shows an average of 40.1, suggesting a high level of income inequality in the country. Furthermore, the growth rate of GDP per capita has a negative mean of −1.3% approximately. This result indicates that average productivity growth for the economy has been retrogressing between 1990 and 2022. External debt to GDP ratio averaged 32.2% and is below the 40% benchmark for emerging and developing countries [63]. Governance effectiveness for the country has been weak as captured by the mean value of -0.98 for the study period. This weakness suggest that the citizens may not have been benefiting from the dividends of good governance, which could further worsen the poverty and inequality situation in the country.

Table 2. Descriptive summary statistics.

	Mean	Max.	Min.	Std. Dev.
PGI	17.721	27.900	9.000	7.488
INQ	40.139	51.900	35.100	3.997
GDP	−1.295	7.242	−12.889	4.942
EDGDP	32.246	110.619	4.713	29.572
GOVEF	−0.984	−0.485	−1.210	0.173
Obs.	33	33	33	33

Source: authors' computation.

Captured in **Table 3** is the correlation matrix for the study variables. Evidences from the table demonstrates weak correlation between the study regressors (GDP, EDGDP, GOVEF). Hence, implying the presence of weak multi-collinearity between the variables and reliability of deduced inferences from the study's model.

Table 3. Correlation test result.

	PGI	INQ	GDP	EDGDP	GOVEF
PGI	1				
INQ	0.121	1			
GDP	0.257	0.065	1		
EDGDP	0.708	0.229	0.003	1	
GOVEF	0.590	−0.037	0.299	0.376	1

Source: authors' computation.

4.2. Unit root test

Table 4. Unit root tests output.

	PP unit root test			ADF unit root test		
	With constant	With constant and trend	Without constant and trend	With constant	With constant and trend	Without constant and trend
PGI	−5.462***b	−5.557***b	−5.477***b	−5.462***b	−5.556***b	−5.477***b
INQ	−15.536***b	−16.746***b	−15.579***b	−6.847***b	−7.097***b	−6.985***b
GDP	−4.497***a	−4.606***a	−4.311***a	−4.477***a	−4.590***a	−4.293***a
EDGDP	−5.812***b	−6.033***b	−5.656***b	−5.655***b	−5.615***b	−5.623***b
GOVEF	−5.337***a	−6.558***a	−21.121***b	−16.462***b	−16.176***b	−16.723***b

Where *** indicate significance at 1%, "a" and "b" represent stationarity at level and first difference.
Source: authors' estimated output.

Captured in **Table 4** is the test for unit root conducted on each series used in the study. The stationarity of the series was determined through the Philips-Perron (PP) and augmented Dickey-Fuller (ADF) unit root tests methods. Ascertaining the stationarity status of the variables can eliminate the potential impact from spurious regression output. Thus, as demonstrated in **Table 4**, while the poverty gap index, inequality, and external debt measures attained stationary at first difference, the GDP indicator attained stationarity at level. In contrast, government effectiveness was a mixture of level and first difference stationarity. Nevertheless, the combination of both level and first difference stationarity of the study series further lend credence to the adoption of the ARDL methodology for the study.

4.3. Cointegration test

After ascertaining the stationarity of the variables, the following step entailed determining the presence of long-run association between the variables through the bounds approach. **Table 5** shows the long-run nexus between the variables. The *F*-statistic of the bounds test was compared to the upper bounds critical values I(1) as a yardstick to reject the null of no cointegration. Conventionally, having the bounds I(1) critical value falls below the *F*-statistic will indicate the presence of cointegration. Thus, considering the *F*-statistic for Equation (1) (3.929) which is higher than the upper bounds at 5% significance level suggest a long-run relationship. Likewise, the *F*-statistic for Equation (2) (5.218) is higher than the upper bounds at 5% significance level, and indicates long-run nexus between the variables.

Table 5. ARDL test result for long-run relationship.

Equation	Test statistic	Value of *F*-statistic	*K*	Sign.	I(0)	I(1)
$\mathrm{PGI} = \mathrm{f}(\mathrm{GDP}, \mathrm{EDGDP}, \mathrm{GOVEF})$	Sample size (*n*) = 32	3.929	3	10%	2.37	3.2
				5%	2.79	3.67
$\mathrm{INQ} = \mathrm{f}(\mathrm{GDP}, \mathrm{EDGDP}, \mathrm{GOVEF})$	Sample size (*n*) = 31	5.218	3	2.5%	3.15	4.08
				1%	3.65	4.66

Source: authors' estimated output.

4.4. Results and discussions of findings

Captured in **Table 6** is the regression output for the effects of economic growth, foreign borrowing, and institutional quality on poverty. Results in the first row represents the long-term output, revealing that although economic growth has a positive impact on poverty, the effect is insignificant. This result contrast the significant positive effect of economic growth on poverty in Okere et al. [20]. Consequently, the implication of the outcome is that economic prosperity has not been effective in reducing the level of poverty in the long-run, indicating the applicability of an exclusive growth process in Nigeria. When the economic prosperity path tends more towards an exclusive nature, it is motivated by foreign forces including, tax and tariffs, macroeconomic elements, and technological development, all of which are presently applicable to the Nigerian economic growth system. In contrast, external debt shows a significant positive effect on poverty levels; suggesting that higher sovereign borrowings have significantly translated to higher poverty levels in the country. This result agrees with studies such as Obiero and Topuz [39] and Andoh et al. [34]. In essence, this behaviour infers that a significant amount of funds often borrowed are expended on projects that seldom improves the quality of life of the people [64]. Similarly, higher level of government effectiveness has an overwhelming level of positive impact on poverty levels. Thus, indicating that increasing the number of government agencies to tackle poverty in the country has not reduced but further aggravated poverty. The inefficiency of these government bodies at reducing poverty may be due to the increase bureaucracies that their operations are embedded in, as well as the overlapping of duties which can make response to poverty issues challenging. Hence, based on the aforesaid, the New-Keynesian theory is validated for Nigeria.

In the second panel, the short-run outcomes are presented. Unlike the long-run output, external debt has an insignificant positive effect on poverty levels; implying that it takes the long-term for external debt to impact on poverty in the country. However, similar to the long-term output, government effectiveness increases the level of poverty in the short-term. The speed of adjustment parameter is rightly signed and significant. Its value suggests that in the event of short-run disequilibrium, about 41% distortion will be corrected for annually.

Table 6. Effects of economic growth, foreign debt, and institutional quality on poverty.

Long run output: dependent variable (PGI)				
Variables	**Coefficient**	**Std. error**	***t*- statistics**	**Prob.**
GDP	0.062	0.205	0.305	0.763
EDGDP	0.140	0.039	3.596	0.001***
GOVEF	36.743	8.926	4.117	0.000***
Intercept	48.958	9.447	5.182	0.000***
Short run output				
Δ(EDGDP)	0.003	0.031	0.104	0.918
Δ(GOVEF)	6.175	2.089	2.956	0.007***
ECM(-1)	−0.412	0.086	−4.774	0.000***
Diagnostic test				
Normality	0.895		R^2	0.44
Serial-correlation	0.559		$Adj. R^2$	0.40
Heteroscedasticity	10.787			

Source: authors' estimated output.

Demonstrated in **Table 7** is the effects of economic growth, external borrowing, and institutional quality on inequality. Results in the first row represents the long-term output and shows that although economic growth has an adverse impact on inequality, the effect is insignificant. The result aligns with Okafor [17], but disagrees with Nguyen [19] who reported a significant adverse relationship. This result suggests that although economic growth has the potential to reduce income disparity, its effectiveness in achieving this purpose may be insignificant in the long-run for the country. Consequently, the long-term effect of the Kuznets hypothesis is not significantly validated. One critical element responsible for this behaviour is the inefficiency in public policy to support the growing migration of labour from primary to advance sectors like manufacturing, information communication technology, and services in the country. It thus becomes difficult for these sectors to adequately absorb the growing productive labour force in the long-term. In contrast, external debt demonstrates a significant positive impact on inequality levels; indicating that higher sovereign borrowings have significantly translated to higher divide between the rich and the poor, instead of bridging the gap in the country. This finding supports Obiero and Topuz [39] and Andoh et al. [34], but contradicts studies including Biglaiser and

McGauvran [35], Nguyen [19], Nguyen [38]. Hence, the implication is that foreign borrowing has been used to support programmes that further widen instead of bridging inequality gap in the long term. However, higher level of government effectiveness is shown to have a substantial negative impact on inequality in the country. Thus, indicating that as the level of government effectiveness increases, inequality declines. These outcomes imply the relevance of the New-Keynesian premise for Nigeria. This outcome agrees with the study by Nguyen [19] that institutional quality significantly diminishes income inequality.

In the second panel, the short-run results are captured, and the lagged inequality has a significant positive effect on current inequality levels. This result implies that previous levels of inequality further aggravate the current level of inequality in the country. Similarly, economic growth was revealed to have a significant enhancing effect on income disparity in the short-run. The result indicates that the growth of the economy can significantly and further broaden inequality in the short-run. This result aligns with the initial stage of the Kuznets premise that economic growth can promote inequality. Currently, the Nigerian economy is characterised by the movement of labour from the agricultural to the industrial sector, the development of the density of talents in technologically sophisticated sectors, variation in the urban informal sector employment ratio, and upgrading from a financially simple or less-complex environment to an advanced financial system. All of these elements can create rapid inequality given the rapid disparity in income attached to such labour transfers in the economy.

Unlike the long-run output, current sovereign debt has an insignificant negative effect on inequality. However, its lagged value has a substantial and negative effect on inequality. Thus, the implication of this outcome is that even though external debt takes a long while to significantly impact inequality, previous debt levels have a reducing effect on inequality in the short-run for the country. The speed of adjustment parameter is rightly signed and significant. Its value suggests that it takes less than a year, in the event of short-run disequilibrium for long-run equilibrium path to be restored.

Table 7. Effects of economic growth, external debt, and institutional quality on inequality.

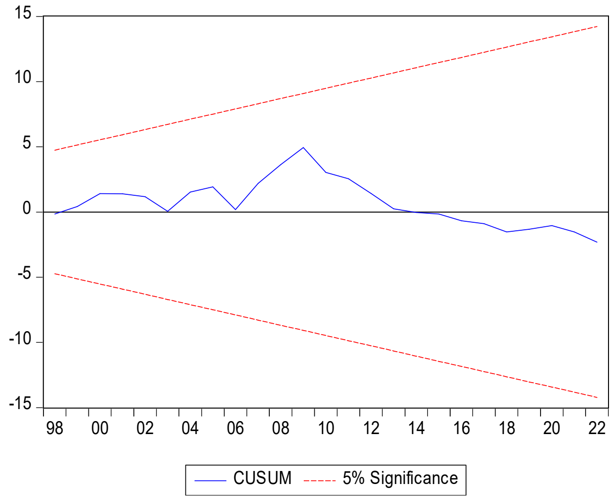
Long run Output: dependent variable (INQ)				
Variables	**Coefficient**	**Std. Error**	***t*-statistics**	**Prob.**
GDP	−0.085	0.150	−0.568	0.576
EDGDP	0.057	0.022	2.640	0.015***
GOVEF	−8.417	4.105	−2.051	0.052*
Intercept	29.607	4.529	6.537	0.000***
Short run output				
$\Delta(\mathrm{INQ}_{-1})$	0.415	0.206	2.016	0.056*
$\Delta(\mathrm{GDP})$	0.192	0.108	1.782	0.089*
$\Delta(\mathrm{EDGDP})$	−0.002	0.058	−0.041	0.967
$\Delta(\mathrm{EDGDP}_{-1})$	−0.109	0.060	−1.819	0.083*
$\mathrm{ECM}(-1)$	−1.335	0.240	−5.553	0.000***

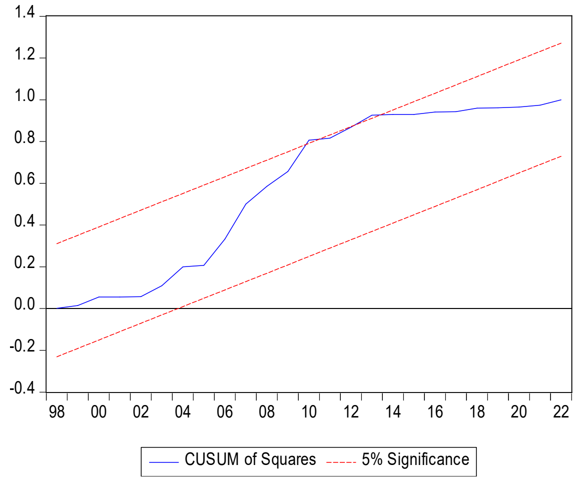
Table 7. (*Continued*).

Long run Output: dependent variable (INQ)				
Variables	**Coefficient**	**Std. Error**	***t*-statistics**	**Prob.**
Diagnostic test				
Normality	4.735		R^2	0.64
Serial-correlation	4.811		$Adj.R^2$	0.59
Heteroscedasticity	11.304			

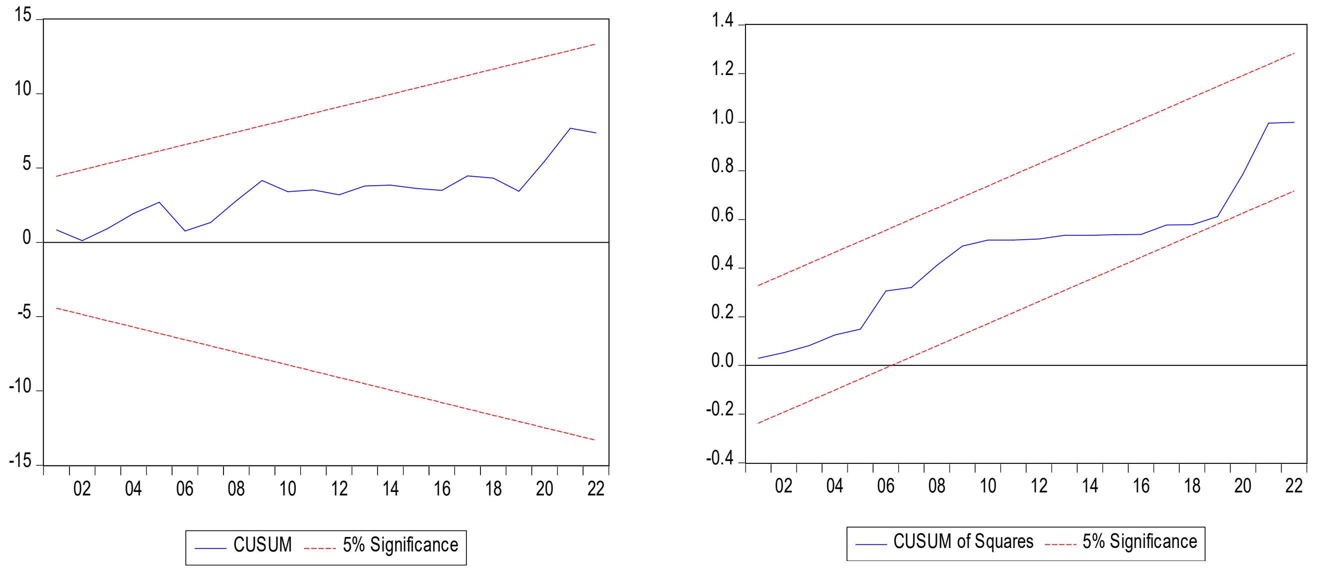
Source: authors' estimated output.

The last rows in **Tables 6** and **7** are the diagnostic tests including normality, serial correlation, and heteroscedasticity. These tests were conducted to ensure the validity and robustness of the study model's estimates for policy formulation. Based on the outputs in **Tables 6** and **7**, the study residuals are normally distributed, and free from serial correlation and heteroscedasticity issues. Furthermore, stability tests were conducted on the model's residuals. The essence of determining the stability of the ARDL model cannot be overemphasized because it aids in the assertion of the estimate's reliability. Hence, the cumulative sum (CUSUM) and CUSUM of square plots are revealed in **Figure 1a,b** to be well within the critical bounds at 5% level of statistically significance; thus, justifying the ARDL estimate robustness and their reliability and consistency for policy recommendations.





(a)



(b)

Figure 1: CUSUM and CUSUMSQ residual stability tests **(a)** CUSUM and CUMSQ for Equation (1); **(b)** CUSUM and CUMSQ for Equation (2).

5. Conclusion and recommendation

This study assessed the effect of economic growth, external borrowing, and institutional quality on poverty and inequality in Nigeria between 1990 and 2022. The research applied the ARDL technique in its empirical analysis. Findings from the study indicated that economic growth does not have significant long-run impact on poverty and inequality. However, the short-run relationship showed that economic growth increases inequality in Nigeria. External debt was revealed to further aggravate poverty and inequality in the long-run. Also, while government effectiveness demonstrated an enhancing effect on poverty in the short and long-run periods, its long-run impact on inequality is significantly decelerating.

Thus, based on the aforesaid conclusions the study recommends an inclusive growth process in tackling the challenges of poverty and inequality in Nigeria. Policymakers need to rethink the exclusive growth path, and instead, adopt an economic prosperity path that promotes productivity alongside reduction in poverty, inequality, and ensures sustainability (inclusive growth). For this purpose, there is the need to strengthen small and medium enterprises through access to finance at lower interest rates and equitable distribution of national wealth through the payment of a living wage, provision of social and economic infrastructure. Also, the agricultural sector should be made more attractive to the youths through encouraging export promotion policies. Leveraging financial technology, and encouraging start-up firms can further reduce the poverty and the inequality level in the country.

Public borrowing should be used to eliminate factors that aid poverty and inequality gap in the economy. Thus, external debt should be invested in poverty and inequality reduction measures such as engaging in well-designed social transfers; provision of social amenities, and economic infrastructure. These measures are bound to reduce the high rate of rural poverty, promote strategic urbanisation, and by extension will reduce urban poverty and inequality rate through less rural-urban migration. Also, the percentage of external debt in human capital development should be increased. Foreign debt should be used to improve the access to, and quality of education and health for the youths, comprising over 70 percent of the nation's population. Consequently, the budgetary allocation for both sectors should be enhanced significantly. Even in infrastructure financing, funding both sectors should form the core of foreign borrowing due to their critical role in tackling poverty and inequality in the country.

Also, institutional responses to poverty and inequality challenge in the country needs to match the complexity and many dimensions of its drivers and require strong consensus at all levels. Government effectiveness is required to support quality education and job creation that will benefit all. Furthermore, the State institutions should be effective at enabling a fair distribution and redistribution of the natural wealth; support fiscal policies that promote equality; guarantee open and responsive governments; support actions to challenge prejudices and cultural norms that underpin discrimination; promote the realization of human rights for all; universal, good quality essential services; well-designed social protection; and investment in all children.

Nevertheless, this study is constrained by sufficient data for a sub-national level analysis of economic growth, foreign debt, and institutional quality on poverty and income inequality in Nigeria. Hence, future studies can explore this limitation for a more robust analysis of the relationship between the variables.

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