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Poverty and Non-inclusive Growth in Nigeria

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Abstract

The paper examines the impact of poverty on non-inclusive growth using the Autoregressive Distributed Lag regression analysis on data collected from the Central Bank of Nigeria and the World Bank database from 1981 to 2020. The obtained result indicates that the initial economic growth level does not result in poverty reduction, while a positive change in economic growth results in poverty reduction. The paper concluded that inclusive economic growth is significant for poverty reduction when it increases employment and improves opportunities for productive activities among the poor. The article recommended measures, such as stable macroeconomic policies, huge investment in agriculture, infrastructural development, and good governance to sustain the inclusive economic growth rate and reduce poverty in Nigeria.

Keywords: Non-inclusive growth; Poverty; Trickle-down effect; ARDL

1. Introduction

Poverty reduction is important in the promotion of inclusive growth in developing countries. Strong evidence from literature has shown that rapid and sustained growth is the single most important way to reduce poverty. The description of poverty in Nigeria as a paradox by the World Bank (1996) is that the poverty level in Nigeria contradicts the country's immense wealth; the wealth includes enormous human capital, agricultural, petroleum, gas, and ample untapped solid mineral resources. Particularly worrisome is that country earned over US$300 billion from one resource, namely petroleum, during the last three decades of the twentieth century. But rather than remarkable record progress in national socio-economic development, Nigeria retrogressed to become one of the 25 poorest countries at the threshold of the twenty-first century. In contrast, she was among the wealthiest 50 in the early-1970s. Essentially, this situation becomes even more perplexing when viewed from the country's perspective has been growing over time. Still, instead, the citizens are suffering from social and economic exclusion (Bakare, 2014). The implication is that economic growth in the country has little or no trickling down effect on poverty and standard of living because a large number of poor and vulnerable people have remained exclusive from the benefits of this progress. For inclusive growth to take place, the distribution of growth is essential for poverty reduction and needs to be pursued.

Poverty is a multi-dimensional issue that affects many aspects of the human condition ranging from physical to moral and psychological (Ogwumike, 2002). Fields (2000)

conceptualizes poverty in absolute or relative terms as the inability of a person household or group to obtain or satisfy the most basic and elementary requirements for human survival in terms of food, clothing, shelter, health, and transport. Relative poverty exists when households have a per capita income of less than one-third of the average per capita income of the country concerned (World Bank, 1997). Herrick and Kindleberger (1983) argue that economic growth involves the provisions of inputs that lead to more significant outputs and improvements in the quality of life of a people. Ostry et al. (2014) suggest that some real development will occur when poverty, inequality, and unemployment are reduced to the barest minimum. Solow (1956) opines that growth and development will be attained during the growth process as a result of 'trickle-down effect'. In his justification for the growing fundamentalism, Keynesians argued that the pace of initial economic growth could only be increased by the rich because they have a high capacity of saving and justified the initial temporary inequality for a better growth in the future.

Other schools of thought like institutionalism, Marxist, and structuralism schools based their theoretical contributions on the pro-poor growth approach, which is labor abundant with accomplishing policies and programs that reduce inequalities (Thornton et al., 1978). Because a robust inclusive-growth strategy is pro-labor, this growth process would benefit more developing countries because they have abundant labor factors. With this approach, a country can easily attain redistribution and maximum social welfare directly without a trickle-down effect to achieve its developmental goals (Kakwani and Pernia, 2000). On the other hand, OECD (2008; 2018) finds that economic growth should be fairly distributed to create welfare opportunities. Ali and Son (2007) suggest that economic growth increases social opportunities shared among the population. Dollar and Kraay (2002) conclude that perception is growth is inclusive when the income of poor people grows relatively faster than the average income of the population.

The motivation of the study is that a majority of the citizens live in a state of poverty while the remaining relatively insignificant minority lives in affluence. These skewed economic relations do not reflect the geographic spread of resource endowment; instead, they result from classical greed, injustice, and selfishness, which is beyond any economic principle. Although the country has growing over time but such steady growth, however, failed to generate more equal income distribution during recent decades, indicating the importance of government policies which must aim at fostering inclusive growth. Also, the recent COVID-19 crisis is hurting people's employment opportunities and has aggravated the level of poverty in Nigeria. These suggest the need to carry out a study of this nature.

The paper examines a relationship between poverty and non-inclusive growth in Nigeria by establishing which poverty variables can help achieve different structural reform targets that can potentially contribute to inclusive growth in Nigeria; non-inclusive growth is defined as the exclusion and marginalization of vulnerable populations groups in the society. Doing so can lead to the success of future poverty alleviation programs. The study's contribution is that it joins a growing literature on aspirations and expectations of poverty and inclusive growth from both theoretical and empirical perspectives.

The rest of this paper proceeds as follows. Section two presents the model and methodology. Section three describes the results and discussion. The conclusions are presented in Section four.

2. Model and Methodology

The study made use of Autoregressive Distribution Lag regression (ARDL) method of analysis in estimating our model by using time series data collected from Central Bank of Nigeria Annual Statistical Bulletin and World Bank database for the period of 1981 to 2020 on household final consumption expenditure (annual % growth) proxies as a measure of poverty reduction and GDP per capita growth (annual %), proxies as a measure of economic growth in Nigeria. Other independent variables are unemployment rate, agriculture to GDP ratio and inflation rate.

Following theoretical framework in this study, we follow Solow (1956) growth model which is built around the familiar neo-classical aggregate production function given as:

$$Y = A^{u}K^{\alpha} L^{1-\alpha} \quad (1)$$

Where:
Y is Gross Domestic Product, K is the stock of human and physical capital, L is unskilled labour used in production, $1^{-\alpha}$ is the parameters that represent technology, A is constant reflecting the initial static endowment of capability and u is the rate of evolution of technology. As poverty reduction mechanism higher technological capabilities will permit greater amount of output from any given level of input, while the increase in output permitted by improve technology will go a long way to increase standard of living of the people and thereby reduce poverty.

Specification and ARDL Model
Therefore, the adopted production function model can be rewritten and specified as follows:

$$POV = f(GDP) \quad (2)$$

The study model is based on whether the nation's economic growth has any significant influence on poverty reduction. Having established this link, the first equation is formulated as:

$$lnPOVRt = f(lnEGt) \quad (3)$$

In line with Barro and Sala (1995), Grootaert et al. (1995), and Ijaiya et al. (2011) methods' of analysis that uses a time subscript (t) and first difference operator (Δ), we therefore model the relationship between poverty reduction and economic growth as follows:

$$ln\Delta POVRt = f(ln\Delta EGt) \quad (4)$$

Equation (4) thus describes the changes in poverty reduction as a function of changes in economic growth and the model was extended by including other variables which influences poverty reduction. In order to empirically test the long-run relationship between poverty and growth the transformation of equation (4) into a linear equation then becomes:

$$ln\Delta POVR\,t = \alpha + \omega\, ln\, \Delta EG_t + \psi\, ln\, \Delta UNEMPR_t + \gamma\, ln\, \Delta AGRIC\_GDP_t + \varphi ln\, \Delta INFLRt + \varepsilon t \quad (5)$$

where, *POVR* represents household final consumption expenditure (annual % growth), *EG* is GDP per capita growth (annual %), *UNEMPR* is unemployment rate, *AGRIC_GDP* is agriculture to GDP ratio and *INFLR* is inflation rate. Also, *ln* is the natural logarithm of the variables, and the estimates of α, ψ, γ, and φ represent elasticities. The error term ε_t is assumed to be white noise normally and identically distributed. The reasons for using ARDL technique are the followings: it has advantage of not requiring a specific identification of the order of the underlying data because it allows a mixture of I(1) and I(0) variables as regressors, that is, the order of integration of appropriate variables may not necessarily be the same. Also, it circumvents the low power of unit root tests and the resulting degree of uncertainty regarding the order of integration of the underlying variables. Additionally, it is also suitable for small or finite sample size (Pesaran et al., 2001).

In order to conduct the bounds test, Equation (5) is converted into an unrestricted error correction model (UECM) form:

$$\begin{aligned} ln\,\Delta POV_t = \alpha + \sum_{k=1}^{n} \delta_1 ln\Delta POV_{t-k} + \sum_{k=0}^{n} \delta_2\, ln\,\Delta EG_{t-k} + \sum_{k=0}^{n} \delta_3 ln\Delta UNEMPR_{t-k} \\ + \sum_{k=0}^{n} \delta_4 ln\Delta AGRIC\_GDP_{t-k} + \sum_{k=0}^{n} \delta_5 ln\Delta INFLR_t + \alpha\, ln\, EG_{t-1} \\ + \psi\, ln\, UNEMPR_{t-1} + \gamma\, ln\, AGRIC\_GDP_{t-1} + \varphi\, ln\, INFLR_{t-1} + \varepsilon_t \end{aligned} \quad (6)$$

where, α is the drift component, Δ represents the first difference operator, and ε_t are white noise errors. In this setup, the short-run effects are inferred by the sign and significance of the estimates of δ_1, δ_2, δ_3, δ_4 and δ_5 while the long-run effects are inferred by the sign and significance of the estimates of α, ψ, γ, and φ. Equation (6) indicates that poverty tends to be influenced and explained by its past values. The structural lags are established by using minimum Akaike's information criteria (AIC). The Wald test (F-statistic) was also computed to differentiate the long-run relationship between the concerned variables.

Since all the variables in the model appear to be trended, a second ARDL-UECM including a trend term (ε_t) is presented in the form:

$$\begin{aligned} ln\,\Delta POV_t = \alpha + \xi_t + \sum_{k=1}^{n} \delta_1 ln\Delta POV_{t-k} + \sum_{k=0}^{n} \delta_2\, ln\,\Delta EG_{t-k} + \sum_{k=0}^{n} \delta_3 ln\Delta UNEMPR_{t-k} \\ + \sum_{k=0}^{n} \delta_4 ln\Delta AGRIC\_GDP_{t-k} + \sum_{k=0}^{n} \delta_5 ln\Delta INFLR_t + \alpha\, ln\, EG_{t-1} \\ + \psi\, ln\, UNEMPR_{t-1} + \gamma\, ln\, AGRIC\_GDP_{t-1} + \varphi\, ln\, INFLR_{t-1} + \xi_t \end{aligned} \quad (7)$$

In this case, the null hypothesis of no cointegration, that is, no long run relationship ($H_0 = \alpha = \psi = \gamma = \varphi = 0$) is tested against the alternative of long run relationship (H_1: $\alpha \neq \psi \neq \gamma \neq \varphi \neq 0$) using the familiar F-test with critical values tabulated by Pesaran et al. (2001). Accordingly, it is hypothesized that the estimates of α, ψ, γ, and φ are positive and statistically significant, thus confirming the diversification-led growth hypothesis.

A-priori expectations $ln\, EG_t > 0$, $ln\, \Delta EG_t > 0$. This indicates that an increase in the initial level of economic growth and a positive change in economic growth are expected to reduce poverty in Nigeria.

3. Results and Discussion

The results of descriptive statistics in Table 1 below show that the probability of some of the variables are not normally distributed, showing high values of standard deviation and Jarque Bera statistics are near zero probabilities. Since the probability value is less than the Jacque Bera chi-square at the 5% level of significance for some variables the null hypothesis that all the variables are normally distributed cannot be rejected since their probabilities are less than the Jarque Bera chi-square distribution. The nature of the data series calls for normalization of the variables. First, a correlation test was used to examine the degree of association among the variables.

All the variables except EG and AGRIC_GDP have skewness coefficients greater than zero, which implying that they may not be symmetrical around the mean and thus deviating from normal distribution. As for other variables their distributions are symmetrical around the mean and thus close to normal distribution. The kurtosis coefficient values of all the variables except AGRIC_GDP and UNEMPR are more than 3; therefore, these variables do not exhibit a normal distribution.

Table 1: Descriptive statistics

	POV	EG	AGRIC_GDP	UNEMPR	INFLR
Mean	3.360541	-54.99354	30.79649	10.38378	19.30459
Median	0.610000	1.201000	32.27000	7.000000	12.90000
Maximum	61.40000	30.35700	47.10000	27.40000	72.80000
Minimum	-27.12000	-2067.000	19.99000	1.800000	5.400000
Std. Dev.	17.73100	340.0386	6.525056	7.807493	16.70039
Skewness	1.112511	-5.829042	0.026547	0.766157	1.680701
Kurtosis	5.102526	34.99546	2.648648	2.391711	4.952084
Jarque-Bera	14.44748	1787.748	0.194661	4.190249	23.29405
Probability	0.000729	0.000000	0.907256	0.123055	0.000009
Sum	124.3400	-2034.761	1139.470	384.2000	714.2700
SumSq. Dev.	11317.98	4162545.	1532.749	2194.450	10040.51
Observations	40	40	40	40	40

Source: Author's compilation, 2020

Correlation Test

In order to avoid the multi collinearity problem that most of the studies of this nature encountered, correlation test was carried out to examine the degree of association among the variables. The results show that all the variables have weak correlation with each other. Since the values of the correlation coefficients of all the variables were less than 0.5 in absolute terms, this shows an absence of a multi collinearity problem among the variables of the study.

Table 2: Correlation test

	POV	EG	AGRIC_GDP	UNEMP	INFLR
POV	1.000000				
EG	0.052944	1.000000			
AGRIC_GDP	0.021449	0.121374	1.000000		
UNEMPR	0.168292	0.156980	-0.481830	1.000000	
INFLR	0.072569	-0.257004	0.160458	-0.434450	1.000000

Source: Author's compilation, 2020

Unit Root Test

The Augmented Dickey Fuller (ADF) unit root test results in Table 3 below show that all the variables are integrated at different order. In other words, both POV and EG are integrated at level, i.e. I(0) while AGRIC_GDP, UNEMPR and INFLR are integrated at first difference, i.e. I(1). Since all series are integrated at different order, ARDL regression method is suitable for the analysis of this study.

Table 3: ADF unit root test

Variables	ADF test statistics	1% critical value ADF	Order of integration	Remarks
POV	-9.4635	-3.6268*	I(0)	Level Stationary
EG	-5.9808	-3.6268*	I(0)	Level Stationary
AGRIC_GDP	-6.4668	-3.6394*	I(1)	Difference Stationary
UNEMPR	-6.6355	-3.6329*	I(1)	Difference Stationary
INFLR	-5.7420	-3.6329*	I(1)	Difference Stationary

1% = -3.6463, 5% = -2.9540, 10% = -2.6158. *, **, *** significant at 1%, 5% and 10% respectively

Lag Length for the Series

The appropriate lag length for the series is lag 1 based on the minimum values of LR (sequential modified LR test statistic (each test at 5% level), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion) and HQ (Hannan-Quinn information criterion) and it is reflected in Table 4 below.

Table 4: Lag length order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-756.4182	NA	1.95e+13	44.78930	45.01377	44.86585
1	-709.8201	76.74981*	5.57e+12*	43.51883*	44.86562*	43.97812*
2	-697.3340	16.89290	1.29e+13	44.25494	46.72405	45.09698
3	-670.1389	28.79485	1.50e+13	44.12582	47.71725	45.35060

* indicates lag selection by the criterion

ARDL Bound Test

The F-statistics result in Table 5 below for all the variables of the study is higher than the critical bound at the 1 percent level of significance. Since the calculated F-statistic is higher than the Pesaran et al. (2001) upper bound critical value at 99% level of significance, so there is need to reject the null hypothesis which states that there is no cointegration, which suggests that the variables under consideration are cointegrated and they have the long-run relationship.

Table 5: ARDL bounds test

Test Statistic	Value	K
F-statistic	17.32012	4

Critical value bounds

Significance	I0 bound	I1 bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's compilation, 2020

The results of equation (6) above and Table 6 below show that all independent variables (EG, AGRIC_GDP, UNEMPR and INFLR) exhibit a negative relationship with the POV. This is an indication that there exist an inverse relationship between all the independent variables and poverty. Furthermore, all these variables do not have significant impact on poverty. Thus, in line with theoretical postulations, one percent increase in economic growth (EG) and agriculture (ARIC_GD) will decrease poverty (POV) by 0.0003 percent and 0.1932 percent respectively. Also, in contrast to theoretical proposition one percent increase in unemployment rate (UNEMPR) and inflation rate (INFLR) decreases poverty by 0.5800 percent and 0.1686 percent respectively. Overall, the results show that in the long-run, all the components contribute to the reduction of poverty level in Nigeria as both variables have positive but insignificant effect on poverty over the period of the study. The ECM, which is speed of adjustment coefficient, is negative and statistically significant at 1 percent shows that there is 148.9 percent point adjustment taking place each year towards the long run periods. Also, the past year of EG causes current POV to decrease by 0.288 units, the immediate past year of AGRIC_GDP component had a positive impact on poverty level because agriculture contributes significantly to the economy. More so, a large chunk of the population especially in the rural areas still depends on agriculture. In addition, immediate past record of UNEMP and INFLR had a positive impact on economic growth.

Table 6: Long and short run estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EG	0.000299	0.005699	0.052460	0.9585
AGRIC_GDP	0.193152	0.336579	0.573867	0.5703
UNEMP	0.580048	0.304635	1.904076	0.0665
INFLR	0.168628	0.123816	1.361922	0.1834
C	-11.769543	13.073754	-0.900242	0.3752
D(EG)	0.000445	0.008484	0.052478	0.9585
D(AGRIC_GDP)	0.287627	0.499138	0.576248	0.5687
D(UNEMP)	0.863764	0.455526	1.896189	0.0676
D(INFLR)	0.251107	0.184501	1.361005	0.1836
ECM(-1)*	-1.489124	0.154957	-9.609925	0.0000

Source: Author's compilation, 2020

Cointeq = POV - (0.0003*EG + 0.1932*AGRIC_GDP + 0.5800*UNEMP + 0.1686*INFLR
-11.7695)

POV = 11.7695 - 0.0003*EG - 0.1932*AGRIC_GDP - 0.5800*UNEMP - 0.1686*INFLR

In Table 7 below the results of diagnostic test carried out to determine the robustness of the model showed that Breusch- Godfrey serial correlation LM test, ARCH test, Breusch-Pagan-Godfrey test, Jacque-Bera normality test show that the model does not suffer from the problem of heteroskedasticity because their probability values are higher than 5% level of significance. Also, Ramsey RESET specification test reflected that the model does not suffer from the problem of omitted variables and linearity assumption at 5% level of significance. Generally, the model has a correct functional form and its residuals are serially uncorrelated, normally distributed and homoscedastic. Therefore, the results are valid for reliable interpretation and policy implication.

Table 7: Diagnostic test results

Breusch Godfrey Serial Correlation LM Test = 0.300220 [0.7430]; Heteroskedasticity Test: ARCH = 0.233446 [0.6322]; Heteroskedasticity Test: Breusch Pagan Godfrey = 1.097990 [0.3820]; Jacque Bera normality test = 4.7625 [0.0924; Ramsey RESET Test = 1.310499 [0.2617]

*, ** and *** indicate significance at 0.01, 0.05 and 0.10 level respectively. Probability values are quoted in square brackets.
Source: Author's compilation, 2020

4. Conclusions

The results of empirically study on poverty and non-inclusive growth in Nigeria showed that economic growth, agriculture to GDP ratio, unemployment rate and inflation rate components affected poverty (POV) level in Nigeria. In terms of unemployment rate and inflation, the findings from this study are inconsistent with economic theory, which stipulates that high level of unemployment and inflation rates will lead to high poverty rate. So, with the celebrated profile of increase in GDP growth rates over the years the solution for the reduction of poverty in Nigeria remains elusive. Therefore, it is evident that non inclusive growth has contributed to high level of poverty rate in Nigeria. The findings suggest that (1) there is need for government to embrace stable, consistent and sustainable agricultural policies that would help to improve agricultural performance in the country, (2) immediate action to stem down high unemployment rate in the country is required, and (3) measures to reduce high inflation rate in the country need to be put in place.

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