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An Empirical study on the relationship between Poverty, Inequality and Economic Growth in Nigeria

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Abstract
The paper used bound testing approach to cointegration and Granger causality test to determine the relationship between poverty, inequality and economic growth in Nigeria. A secondary time series data were used in the study from 2000 to 2012. In examining the causal relation among the variables, the result shows that there is a unidirectional causal relationship running from RGDP to poverty, which means that an increase in GDP in Nigeria causes high level of poverty. In addition, the result revealed that the RGDP Granger causes the literacy level without a feedback. The result further infers that the bidirectional causal relationship existed between literacy and poverty. The paper also indicated that population growth Granger causes literacy without feedback while unidirectional causality exists between poverty and population. The policy implication is that demand management policies aim at reducing the gap between rich and poor should be vigorously pursued in order to minimise the rate of lingering inequality in the country and spur institutional change that will bring about betterment of people in the country. More so, concerted effort is needed to strengthen small and medium enterprises through tax holiday, access to finance and temporal protection so that more employment would be generated which in turn will reduce poverty and inequality.
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1. INTRODUCTION

Poverty eradication has been a major concern in Nigerian economy and the world at large. Poverty in rural area as against prosperity in urban area reflects what we call inequality within a country. Poverty has many dimensions which may include inadequate access to government utilities and services, environmental issues, poor infrastructure, illiteracy and ignorance, poor health, and insecurity. In urban areas, the burden of demand for services has negative effects on school enrolment, access to primary health care, and growth of unsanitary which in the long run resulted in poverty while in rural area poverty manifests itself more in the agricultural sector and dwindling food security (Ali and Tahir, 1999; Aliero and Abubakar 2007).

The concept of inequality means unfairness which usually manifest in terms of inequitable distribution. In an economic context, inequality referred to the outcome of skewed income distribution. Inequality of income distribution implies that there are some groups of people, which are referred to as capitalist, getting a bigger share of the total income while the other groups of people also referred to as workers, and are getting lesser share. This set in the debate of social justice where the workers may feel that their welfare is being scarified for the sake of industrial developments pioneered by the capitalist, thus creating inequality in the economy. There are some reasons associated with the causes of inequality which also related to poverty. One of the reasons is the dissimilitude of access to education. The variation in people's education level generates an income inequality within a country due to the fact that workers with high education level qualifications receive differential wage rate with workers with low educational attainment. Another cause of income inequality is capital mobility within or between the countries. Investors and firms would like to shift their investment to other places or countries to seek for cheaper labour in order to take advantage of lower cost of production. While the investors and firms take the benefits of this shift, this will probably cause a fall in income or unemployment in the country on the one hand, and will create inequality in the other country or place on the hand (Gelaw, 2009; Stephen and Simeon, 2013). Nigeria may portray a high level of income disparity between rural areas and urban centres owing to most rural communities depend on agriculture amidst downfall in demand for agricultural produce while urban centres engages mostly in more rewarding jobs.

Trade liberalization also has an effect on rising inequality in the country. The main reason to explain these circumstances is trade liberalization introduces the latest technology in the country and this highly requiring well educated labour more than their supply, and this raises the income of skilled labour and press down the wages of abundant unskilled labour due to the demand of unskilled labour is relatively low and thereby creating inequality in the country. Inequality can also be as a result of political bias in a country, whereby certain developmental projects and industrialization are being located in a particular area or region, which will result in

huge social problem such as a large number of workers migrate to those areas, which at the end causing unemployment in the region. Corruption is also a factor which causes an inequality in the country. According to Gupta, Davoodi and Alonso-Terme (2002) the causality from corruption to inequality can be as a result of a biased tax system and might lead to the tax evasion, defective tax administration and exemptions that favour the wealthy individual.

The world economy grows constantly, but the growth pattern can change over time and among the countries, and this growth is due to technological change, increased efficiency and capacity in the use of resources and creation of material wealth. The aim of economic growth in every country is the betterment of the living condition of the poor. Economic growth that does not lead to a sharp and sustained reduction, poverty may create problems than it solves. Similarly, if rapid growth is achieved at the expense of a worsening the in the distribution of resources, the growth will become unsustainable and resulted in inequality. Economic growth is considered to be a powerful force for reducing income inequality and then reducing poverty. The objective of this study is to examine the causal relation between inequality, poverty, and economic growth in Nigeria. To achieve the objective, the paper is structured into five sections. Section two contained the review of both theoretical and empirical literature while section three is the material and method. The results were discussed in section four and the last section concludes the study.

2. LITERATURE REVIEW

The studies on the relationship between poverty, inequality and economic growth have always been an important one in the developing countries like Nigeria and it generates lots of debates on whether the relationship is positive or negative. Some scholars have argued that unequal distribution of income stimulates economic growth while others hold a view that income inequality affects growth and contributes to rise in poverty level.

According to Deininger and Squire (1996) to reduce poverty and promote growth, it is necessary that public authorities reinforce their efforts to distribute the income within an egalitarian manner. Along this line, Bourguignon (2003) argued that reducing inequality causes the reduction of poverty. Piketty and Saez (2003) suggest that countries with large number of poor and unequal distribution of income cannot benefit from economic growth and based on which Barro (2000) concluded that the effect of income inequality can be positive or negative depending on the level of economic developments. Income inequality in poor countries retards economic growth, while income inequality in rich countries stimulates growth. Peroti (1993) argued that a high level of income allows the state to allocate more tax in different sectors, health, education and social protection. According to Dalton (1920) inequality increases when there is a transfer of income from a poorer to a richer. Moreover, Wilkinson and Pickett (2012) contended that greater inequality seems to lead to general social dysfunction. Homicides rates are lower and children experience less violence in more equal societies, people trust each other less in more unequal societies and less equal societies tend to do worse when it comes to health, education and general wellbeing. Rajan (2010) argued that the growing income inequality was a key factor leading to the financial crises and the perennial economic downturn.

Many studies were conducted to verify the theoretical postulation relating to poverty and growth nexus in both developed and underdeveloping countries. However, their finding is far from unanimous. For instance, Aigbokhan (2000) conducted a research on the relationship between poverty, inequality and economic growth in Nigeria for the period 1986 to 1996 and found a significant positive relationship between growth and poverty, meaning that the impressive growth of the economy from 1986 to 1992 exacerbated the level of poverty in the country. His findings suggest that the so-called “trickle down” phenomenon, underlying the view that growth reduces poverty and inequality, is not supported by Nigeria’s data. Similarly, Cheema and Sial (2012) conducted a research in Pakistan for the period between 1992/93 and 2007/2008 and their result shows that inequality plays a significant role in affecting poverty. Deininger and Squire (1998) and Bruno, Ravallion and Squire, (1996), conducted a research using cross section data and have argued that, on average within country inequality is stable over time, or changes too slowly to make a significant difference in poverty reduction. Kanbur and Lustig (1999) have argued that, large increases in income inequality in countries like Sub-Sahara Africa, Latin America, Eastern Europe and central Asia over the 1990s increased the negative effects of growth on poverty. Stephen and Simeon (2013) conducted a research on economic growth and poverty in Nigeria and the results revealed that there is positive and significant relationship between economic growth and poverty, which implies that economic growth does not reduce poverty.

From the above peruse literature review, it could be seen as little studies have been conducted in Nigeria regarding the causal relationship between poverty, inequality and economic growth. Those little studies related to our research work were carried out a long time ago, and there were a number of structural changes in the economy that were made which may have reduced poverty or inequality in Nigeria between the time these studies were carried out and the current situation in Nigeria. In view of this problem in mind, it is the intent of this paper to fill in the identified gap.

3.1 METHODOLOGY

This paper used secondary time-series data sourced mainly from Central Bank of Nigeria (CBN) and National Bureau of Statistic (NBS) covering 2000 and 2012 periods. The data consist of Real Gross Domestic Product (RGDP), Poverty rate, Population Growth, Literacy level.

3.2 MODEL SPECIFICATION

The model of this paper expresses economic growth, which is proxy by the RGD as the function of various components of inequality and poverty (represented as the variables that determine the relationship between inequality and poverty). These variables include poverty itself, population and literacy level. The model is express in linear form as follows-

RGDP = F (POV, POP, LIT)……..(1)

The model is also expressed in the logarithmic form which will allow us to interpret the results in elasticity. The below is double-log form of the model.

$LNRGDP = \beta + \beta_2 LNPOV + \beta_3 LNPOP + \beta_4 LNLIT + \varepsilon_{t}$ …….... (2)

Where:

LNRGDP = Natural log of real GDP

LNPOV= Poverty rate

LNPOP= Population

LNLIT= Literacy level

ε_t = error term

β2, β3, β4 are the coefficient of percentage change in the level of poverty, population and literacy level respectively.

3.3 Estimation Procedure

Property of the series would first be examined In order to determine their order of integration among the variables. Basically, there are various ways of detecting the order of integration of series. Owing to its flexibility, Augmented Dickey Fuller (ADF) is one of the most widely applied econometric methods for testing unit root in time series research. A series which is stationary after being differenced once is said to be integrated of order 1 and was denoted by I (1). In general a series, that is stationary after being differenced *n* times is integrated of order *n*, denoted by I (*n*) while a series that appears stationary without differencing, is said to be I (0) (Shabbir, Anwar, Hussan and Imam, 2012). ADF unit root test for stationarity test is based on the following regression model:

$$\Delta Y_t = \beta_0 + \beta_1 T + aY_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t-j} + \varepsilon_t \text{.....(3)}$$

Where Y_t , T and Δ respectively confers a time series, a linear time trend and first difference operator, β_0 is a constant, k is respecting the optimum number of lags on the dependent variable, and ϵ_t is random error term. The null hypothesis for testing non-stationarity is H_0: α = 0 meaning economic series are non-stationary. If the hypothesis of non-stationary is established for the underlying variables, it permits the assessments for co-integration relations.

The bounds testing for cointegration proposed by Pesaran, Shin and Smith (2001) is used. This test is based on Autoregressive Distributed Lag (ARDL) and the test could yet produce robust result in the event of the mixture in order of integration among the series. The ARDL model for equation (2) is specified as the following equation.

$$\Delta RGDP = \alpha_0 + \sum_{i=1}^{p} \beta_1 \Delta RGDP_{t-1} + \sum_{j=0}^{q} \lambda_j \Delta LNPOV_{t-j} + \sum_{k=0}^{r} \varphi_k LNPOP_{t-k} + \sum_{l=0}^{s} \vartheta_l LNLIT_{t-l} + \varepsilon_t \text{.....(4)}$$

From the above equation *p, q, r*, and *s* denotes to the respective optimal lagged differences of *LNRGDP, LNPOV, LNPOP and LNLIT*. Given that the appropriate ARDL model is specified, adding the lagged level of variables into the equation (4) will yield the suitable equation for testing cointegration relation among the variable.

$$\Delta RGDP = \alpha_0 + \sum_{i=1}^{p} \beta_1 \Delta RGDP_{t-1} + \sum_{j=0}^{q} \lambda_j \Delta LNPOV_{t-j} + \sum_{k=0}^{r} \varphi_k LNPOP_{t-k} + \sum_{l=0}^{s} \vartheta_l LNLIT_{t-l} + \mu_1 LNRGDP_{t-1} +$$

$$\mu_2 LNPOV_{t-1} \mu_3 + LNPOP_{t-1} + \mu_4 LNLIT_{t-1} + \nu_t \text{.....(5)}$$

According to Jiranyakul (2013) the computed F-statistic obtained from estimating the preceding two equations could be compared with the critical F-statistic. If cointegration exists, replacing the lagged level variables with one-period lagged residual from the estimate of the equation (2) will give the coefficient of the error correction term.

4. RESULTS AND DISCUSSION

Having described the methodology of this study in the preceding section, the current section begins with the result of Augmented Dickey Fuller unit root test and is presented in Table 1 as follows:

Table1: ADF Test

	Augmented Dickey-Fuller (ADF) Test	
Variables	Levels	1st Difference
RGDP	5.795	-1.449
POVERTY	0.173	-4.632***
POPULATION	-0.266	-3.329**
LITERACY	0.689	-7.850***

***& ** indicate significance at 1% and 5% level

It could be observed from Table 1 above that all the variables are not stationary at their level at 1% level of significance. Nevertheless, they attained stationarity when first differenced. Therefore the series satisfies precondition for bound testing cointegration which requires a degree of integration of any series not to exceed one. All variable can either be I(0) or I(1) or mixture of I(0) and I(1). The result of a bound testing approach for cointegration is presented in the Table 2:

Table 2: Bound testing for co-integration

Critical value	f-statistics = 1.372	
	Lower Bound	Upper Bound
1%	5.08	8.86
5%	3.19	6.07
10%	2.42	4.95

The lag length k=2 was selected based on the SIC. Critical values are obtained Turner (2006).

The result of the bound testing for cointegration in Table 2 reveals that the calculated F-value is less than lower bound even at the 10% level of significance (critical value). This indicates that there is no evidence of the long run relation among the variables.

Table3: Granger Causality test

Dependent Variable	Independent Variables			
	RGDP	POVERTY	POPULATION	LITERACY
RGDP	-	0.272	0.102*	0.115
POVERTY	0.001***	-	0.666	0.051**
POPULATION	0.902	0.010***	-	0.544
LITERACY	0.002***	0.000***	0.051**	-

***** &* Denotes to significance at 1%, 5% level and 10% probability levels

The results in Table 3 indicate that a unidirectional causality runs between RGDP and poverty, meaning that increase in RGDP trickles up the middle and high income group thereby exacerbating inequality within the country. Poor people are gaining very meagre from the growth of the Nigerian economy. The finding from this study supported the assertion that economic growth brought about modernization through an increase in literacy level as it reveals in the study that RGDP Granger cause literacy without a feedback. One way causality existed between population growth and RGDP and so population growth is a salient factor in enhancing the performance of the Nigerian economy. Bidirectional causality existed between literacy and poverty. This is a call for concern because the literacy level is increasing vis-à-vis the rate of poverty which a jobless growth in Nigeria. Population growth Granger cause literacy rate without feedback. Unidirectional causality runs between poverty and population, which loosely confirm the micro-household theory of population of Nigeria. Due to the high level of poverty in the country some parents are being considered children as an investment good (for child labour) in one hand and insurance (take care of them against old age) on the other hand. .

5. CONCLUSIONS

This study examines the causal relationship between poverty, inequality and economic growth in Nigeria from 2000 to 2012 periods. The result of bound testing for cointegration reveals that there is no evidence of long run relationship among the variables. In examining the causal relation the, result shows that there is a unidirectional causal relationship running from RGDP to poverty, which means an increase in GDP in Nigeria causes high level of poverty. In addition, the result revealed that the RGDP Granger causes literacy level, but literacy does not Granger cause RGDP. This confirms the current situation in Nigeria that as GDP increases government tends to build more schools which results in an increase in the level of literacy. However, labour market is not

responding to the pressure of labour supply thereby leading high rate of unemployment of both skills and semi-skills labourers. Unidirectional causal relationship existed between population growth and RGDP which means a population growth causes RGDP to increase in Nigeria. The result further reveals that the bidirectional causal relationship existed between literacy and poverty. The paper also indicated that population growth causes literacy without feedback while unidirectional causality exists between poverty and population. The policy implication is that demand management policies that will aim at reducing the gap between rich and poor should be vigorously pursued in order to minimise the rate of inequality in the country. More so, concerted effort is needed to strengthen small and medium enterprises through tax holiday, access to finance and temporal protection so that more employment would be generated which in turn will reduced poverty and inequality.

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