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# **Corruption, Inequality of Income and Economic in the Nigeria**

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## **Abstract**

The paper examines empirically, the effects of corruption on inequality of income and economic growth. Firstly, the long run structural relationship is examined through the technique of Autoregressive distributed lag model (ARDL). Secondly, the causality relationship is measured empirical results suggest a long run relationship between corruption, inequality of income and economic growth in the Nigeria. Emphasizing on the channels of influence of growth, the finding, in the dynamic corruption equation indicates that the coefficient of the economic growth is significantly negative. This implies that despite much rhetoric to the contrary fighting corruption in Nigeria requires resources. More so, the finding suggests inequality of income directly impact on economic growth. This implies that economic growth rises with inequality of income. The policy implication is that Nigeria economic growth problems are structural as such fighting corruption require huge economic resources.

**Keywords:** Co-integration, Inequality of income, per -capita income, Poverty

## **1. Introduction**

The interconnectivity among corruption, inequality of income and economic growth has been an area of considerable debate. Since recently, in both research directions, an increasing attention has been made to measure the more precise channels, through which corruption and inequality of income impulse for growth could be generated. The major jolt to this development thinking emerged due to the practical experience reflected in the rate at which the economic growth of some the countries in Sub-Saharan Africa is growing rapidly in the midst of poor governance and corruptions (Yusuf, Malarvizhi & Khin 2013). A typical case here, is one of the oil rich country Nigeria, which recent data have indicated that economic growth of Nigeria rose to the average of 7% since 2006, and inequality rose from 0.429 in 2004 to 0.447 in 2010 (NBS, 2011). In the mist of these rising economic growth and inequality of income the country continues to show high rates of corruption and poor governance. In fact, a recent report of the International transparency global corruption ranking, ranked Nigeria the 3<sup>rd</sup> most corrupt country in the West African region. The report ranked Nigeria 144 of 177 countries out of which data are made available (IT 2013).

This apparent paradox of rising economic growth with high level of corruption raised the issues of concerned among different studies on whether corruption was beneficial or harmful to the growth and

under what circumstance the channels of influence does it affects economic growth. Thus, the dominant literature such as the study of (Mauro, 1995, Knack, & Keefer, 1997, Gupta, Davoodi & Alonso- term 2002) reports empirical evidences confirming that corruptions are much more damaging in a context where corruptions is higher as results of growth –retarding pattern of accumulation. They went further to argue that corruptions lowers investment and consequently, economic growth. But the findings of these studies are doubtful. For one hand, they failed to provide a clear transmission mechanism through which corruption retards economic growth. Secondly these types of studies heavily draw conclusion on cross- country panel data analysis ignoring the country unique context specificity. Even though there are quite a number of country specific case studies such as the studies of Adenike (2013), Uma and Eboh (2013), Ajie and Wokekoro (2012), Agba, (2010), Aliyu and, Elijah (2008) these studies are not far free from certain limitations. As most of these studies have failed to pay much attention to other channels of the transmission mechanism through which corruption affect economic growth such as inequality of income, which causes potential bias of endogeneity and missing variables.

This study contributes in various ways, in filling the existing gaps in the literature 1) including inequality of income in the channels of influence between corruption and economic growth

(2) Utilizing both conventional and structural break unit root test. (3) Employing the ARDL bound testing approach to Co integration for a long run relationship between the variables in the presence of structural breaks (4) Using Vector error correction mechanism to determine the causality relationship both in the long run and short causality.

The main objective of this paper is to determine the long run and causal relationships between corruption and economic growth by including inequality of income in the transmission mechanism. With this background introduction, the remaining parts of the paper is structured as follows: Section two of the paper consists of material and methods, while section three provides the empirical results and section four presents the discussions and the conclusion of the paper.

## **2. Literature Review**

Theoretically, the literature reaches no consensus about the effect of corruption on economic growth. Some of the studies hold the views that corruption might have been beneficial to economic growth ( Leff, 1964, Huntington 1968, Khan 1998, 2002 and Chang- Ju Huang 2012). Corruption stimulates bureaucrats to provide more efficient government services, and it enables an easiest ways for entrepreneurs to dodge inefficient regulations. Corruption could result in more efficient resource allocation. In the sense that every poor country could be analyzed as having restrictive rules in certain sectors and also in private monopolies

On the contrary corruption may corruption constrains economic growth by hindering both internal and external productive investments through tax and discouraging entrepreneur manpower development, which will, in turn, reduce economic growth and decline in economic growth. In another way, corruption reduces the quality of social infrastructures such as roads, electricity, housing, and water supply. Corruption also diverts marginal talent into rent seeking, which discourages the composition of public expenditure. Corruption also reduces tax revenue where entrepreneurs are diverted into an informal arrangement of excessive rent taking which reduces taxes in exchange due to excessive rent taking by the officials. In fact, corruption may lead to lower output due to low level of investment and low level of output (Mo, Pak Hung, 2001, Gupta et al 2002, Gyimah- Brempong 2002).

Thus, among the well-recognized development literature the pioneering work of Mauro (1995) suggests that corruption is harmful to economic growth. Mauro uses assembled data of a selected number of both advance and poor countries. The study employed the technique of single equation analysis through

the OLS using some instrumental variables. The findings provide evidence of negative impacts of corruption on economic growth. The transmission of mechanism was traced to human man capital development. The problem with Mauro study is the omission variable basis. [1] Eichengreen, and Gupta, (2011) use Meta study of 72 empirical findings through the method of fixed and random effects analysis. Equally he implored weighted means to test the precision effects. The empirical results of his study suggest that corruption causes a decline in per-capita income and that corruption relatively affects economic growth in mixed countries than the poor countries. In a more recent development Eichengreen, and Gupta, (2011) pointed out that human capital serves as a transmission mechanism through which corruption affects economic growth. However, their study is one of the recent studies that provide a synthesis of the existing evidence on the relationship between corruption and economic growth. However, the study of Eichengreen, and Gupta is not free from criticisms; their study was attacked on the basis of their inability to engage in the bigger debate on historical causality which almost impossible to establish using econometric data analysis.

Barbier, (2010) examines the causal linkage between corruption long run economic growth and adjusted saving rate within the sample of African countries and Asia economies from 1970 to 2003. Empirical evidence from his study reveals that corruption has been the major impediment affecting African countries to re-invest rent- driving investment in a short run period of time. Thus he pointed out that in Asian countries, corruption play insignificant role in undermining growth due to their focus on resource driven growth. His study suggests that African demand effective management strategy of combating corruption. However, the critics of Barbier study argue that reading too much into correlation regressions may have unintended consequences, understanding corruption in Africa goes beyond correlation regression, but demand historical explanation on how to address structural problems of corruption and economic growth.

Blackburn and Forgues-Puccio (2009) focused to find out why some countries with high corruption still experiencing high growth performance. They use the technique of dynamic general equilibrium model. The results of their findings reveal that whether corruption is detrimental to growth or no depend on the way bureaucrats organized and co-ordinate their rent-seeking attitudes. They went further to demonstrate that in a situation where corruption is well coordinated and properly managed, corruption can lead to higher rate of economic growth.

The work of Lambsdorff (2007) co-opted the ratio of GDP to capital stock to measure average capital productivity. His empirical finding reveals a negative impact of corruption on the average ration of capital productivity. This suggests that the role of inequality of income in corruption and economic growth relationship has been neglected in this literature Bardhan (2006, Mauro, 1995, Knack, and Keefer, 1997, Tanzi, and Davoodi 1997) examine the long run relationship between corruption and economic growth through the least square method. Thus, these studies did not consider the role of the integration and co- integration property of the series. This draws doubt, really, on what their model estimated. It is representing a structural long run equilibrium relationship or a spurious one? This study takes this issue seriously and considers the possibility of filling in the vacuum. This paper contributes to the existing body of literatures by introducing inequality of income into the competing debate. In this regards we also address the general methodological problems in the following ways:

Several studies have discussed a relationship between corruption and income inequality. The theoretical origin of this relationship is established from rent theory which came from the ideas of Rose-Ackerman (1978) and Krueger (1974). The point is that corruption may generate persistent distortion from which some certain categories of people gain more than the others.

Chiung-Ju Huang (2012) examines the relationship among corruption inequality of income and

economic growth in ten countries in Asia using panel vector error correction approach. The findings do not support the common views that corruption retard economic growth. The results reveal that increase in economic growth will cause an increase in income inequality. More so an increase in income inequality will cause an increase in economic growth.

Gyimah-Brempong (2002) uses panel data from African countries to investigate the effects of corruption on economic growth and income inequality. The findings of the study reveal that corruption decreases economic growth directly and indirectly through decreased investment in physical capital. The results also showed that increased corruption is positively correlated with income inequality.

Li, Xu, and Zou (2000), Gupta et al (2002) and Chong and Calderon (2000a and 2000b) examine the effects of corruption on income inequality and poverty. Taking a sample data of a mixed group of countries which comprises low, middle and advance countries, the findings suggest a U shaped relationship between corruption and income inequality. Their studies reveal a positive relationship between corruption and income inequality in advance countries and a negative relationship in poor countries.

With regards to Nigeria some of the few empirical studies on corruption and economic growth include the study of Adenike (2013) who examined the impacts of corruption on economic growth in Nigeria using an annual time series data from 1980-2009, using regression analysis and granger causality test. The findings of his study suggest that corruption per worker impact negatively on output per worker directly and impacts indirectly, on the foreign private investment, expenditure on education and capital expenditure per worker. The study also reveals a one-way causality relationship from output per worker to corruption per worker.

Age and Wokekoro (2012) examine the inputs of corruption on sustainable economic development using ordinary least squares. The study finds out that weak institution of governance, dysfunctional legal system, lack of transparency, high poverty/unemployment rate political interferences in the operation of the anti corruption agencies constitute the major causes of systematic corruption in Nigeria.

In support of this views Agba, (2010) examines the different types of corruption and came to the conclusion that bureaucratic and political corruption weakens good governance in Nigeria. Therefore, argued that there is the possibility that corruption may continue to persist in Nigeria due to her low level of capitalist development.

Adogamhe (2010) provide indebt study on the relationship between institutional policies of fighting corruption and poverty reductions, his study focus on the analysis of the National economic empowerment development strategies (NEEDS) which was aimed at institutional reforms in Nigeria. His study demonstrates that poor segment of the Nigerian society are not fully involves in governance. This according to him may suggest why the level of inequality in income distribution is at a wide range. Therefore, the program of NEEDS which was aimed at fighting corruption does not deliver the goods. However, the problems with the work of Adogamhe is the lack of transmission mechanism between corruption to economic growth because the linkage between institutional policies and poverty is not direct one it pass through the economic growth that is to say economic growth is necessary even though not sufficient for poverty reductions it depend on the level of income distribution.

Aliyu and Elijah (2008) Study, confirms the long run co-integration among corruption and economic growth. The problem with this study is their inability to explain the interconnectivity of the channels of influence, addressing the fundamental problem of simultaneity bias. There are a number of concerns with the study of Aliyu and Elijah (2008). Although their study have considered the nature of 1 (1) variable as a condition of integrating the series based on a unit root test and co-integration. Insufficient sample size renders their analysis impotent and may lead to misguided conclusions. The study of (Agba

2010) is one of the current studies that used trivariate model but his study focused on causes of corruption and economic growth, and the authors found that there are many causes of corruption in Nigeria and that corruption is inversely related to economic growth. However, his study neglected the role of inequality of income which calls for the needs of including inequality of income to serve as a transmission mechanism in the relationship.

### 3. Data and Methodology

This study utilized both conventional and structural break unit root test and also employed the ARDL bound testing approach to Co integration due to the presence of structural breaks. More so this study utilizes VECM Granger causality test for testing of both long run and short causality. However, since the use of ARDL relied on the time series features of the data this study ensure that the integration order is not about 1 (2), because, 1 (2) series integration produces spurious regression. Similarly, if a series are found to be integrated in order of 1 (2) the estimated F- test became invalid. Therefore, for the sake of the identification of the order of the integration a unit root test is conducted (Narayan, 2006). This is specified below:

$$\Delta \ln GDP_t = \beta_1 + \beta_2 \ln EQ_t + \beta_3 \ln CC_t + \epsilon_t$$

$\ln GDP_t$  is the Per-capital GDP proxy for economic growth,  $\beta_1$  is the constant terms and  $\beta_2, \beta_3$  is the slope of the coefficients and  $\ln EQ_t$  is the Inequality of income,  $\ln CC$  is the control of corruption and  $\epsilon_t$  is the disturbance terms.

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In (2),(3),  $\Delta$  stand for the first difference operators. Variable definitions are as earlier defined in equation (1).

Thus the co-integrating long run relationship is established through the following estimate

$$\delta_1 = \delta_2 = \delta_3 = 0; \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0; \delta_8 = \delta_9 = \delta_{10} = 0 \text{ is based on (2), (3).}$$

The estimated result is obtained from the bound testing procedure which compares with a critical value obtained from the critical values table. The decision rule is that if the estimated F-test values of the joint significant obtained from the Wald test is greater than the upper critical value the null hypothesis of no long run relationship is rejected and concludes that there is the presence of long run relationship.

However, on the other hand if the computed F-test of a joint significant obtained from the Wald test results lies below the lower critical value, we conclude that there is no long run relationship, but should in case it fall in between then it become indeterminate. Thus, it should be noted that the existence of long run co-integration relationship does not simply imply causality. To determine the direction of the causality error correction test must be conducted through the signing of the ECM then there causality is determined both in the short run and long run. Therefore, in order to establish the direction of causation amongst variables, we took the next step of estimating the Error Correction Model (ECM) as suggested by PSS (Pesaran, H. H., & Shin, Y. 1998) which is specified in equations as follows:

$$\text{et- - -} \\ \text{------(5)}$$

$$\text{et- - -} \\ \text{------(6)}$$

$$\text{et -- -} \\ \text{-----(7)}$$

All equations are definitions follow earlier defined in equation (2), (3), (4) above.

*Sensitivity test for the stability of the parameters*

A stability test is also conducted in order to determine the stability of the coefficient of the series in the equation. The stability of the series was conducted through the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of recursive residuals of square (CUSUMSQ) introduced by (Pesaran and Shin, 1998). The decision rule is that, if the plot parallel line of the two tests is found within the 5% critical bounds the null hypothesis of stability cannot be rejected. On the contrary if the plot parallel lines are crossed the null hypothesis of the parameter stability is rejected at the 5 % level.

Data are collected from different sources, the GDP per-capita income data is collected from the World Development indicators extracted for Nigeria. The Inequality of income data is obtained from the National Bureau of statistics of Nigeria. Data on Control of corruption were sourced from the Freedom house now known as transparency international (IT)

#### 4.0 Estimation of the Results

**Table 1 Test for the Unit Root (Augmented Dickey Fuller and Phillips Perron Test**

Series	ADF test		Phillips Perron test	
	At level	First Difference	At level	First Difference
LnGDP	-1.911448	-2.164056*	-1.911448	-1.881715*
LnEQ	-1.067306	-3.778710*	-1.058397	-3.778818*
LnCC	-3.141732	-5.819301*	-3.141732	-11.49360*

Note\*\* \* \*\*\* Indicate the level of significance at 1%, 5% and 10% respectively

However, it should be noted from the table above the null hypothesis of not unit root cannot be rejected at level. After first differencing the integration of the series where achieved as the variables become stationary at 5% level of significance.

Bound Testing results for the existence of Long run relationship

**Table 2. the Bound Testing Critical Values**

Test statistics	Level Significant	ofCritical Values with trend	
		1(0)	1(1)
	1%	5.754	6.483
	5%	3.993	4.533
	10%	3.247	3.773



**Table 3 F statistics**

LnGDP	16.4707*
LnEQ	9.46*
LnCC	9.50*

Note: \* \*\* \*\*\* reveals the level of significance of rejecting a null hypothesis 1%, 5%, 10% level accordingly.

Based on the result in table 2 and table 3 these indicate that the estimated F-test for the joint significant of two of the variables is greater than the upper critical values at 5%. Therefore, we can reject the null hypothesis of no co-integration and concludes that there is a long run relationship between the series under estimation. However, it is also evident that the estimated F-test does not fall below the critical value. Thus, it is noted that the series of LnCC does not co- integrate because it value has fallen below the critical value t 5% level of significant.

**Table 4 Computed Long run Relationship Taking LnGDP as a Dependent Variable**

Regressors	Coefficient	Standard Error	T-Ratio [Prob]
LnEQ	5.8373	1.2284	4.7519 [0.005]
LnCC	8.120107	2.877024	2.8224[0.004]
T	3.17524	1.44002	2.2050 [0.008]

ARDL (1, 0, 1, and 0) selected based on Hannan-Quinn Criterion

From the above table 5 the LnEQ is statistically significant implying that inequality of income causes economic growth in the long run. However, it was similarly found that LnCC which stand for corruption also causes economic growth in the long run. T stands for the trend which is also statistically significant

**Table 5 Dynamic Error Correction Mechanism Based on the Selected ARDL Models**

	Dynamic LnGDP <sub>t</sub>	Dynamic LnEQ <sub>t</sub>	Dynamic LnCC <sub>t</sub>
Regressors	Coefficient	Coefficient	Coefficient
DlnGDP <sub>t-1</sub>	1.6472** (5.1699)	0.6386** (-2.6225)	-0.0096779** (-2.9493)
DlnEQ <sub>t-1</sub>	1.152838** (-5.0188)	0.18893** (2.4187)	23.5554 (0.92988)
DlnCC <sub>t-1</sub>	8.9598** (2.5820)	0.007208 (1.2826)	70.5544** (2.8265)
Ecm <sub>t-1</sub>	0.28218** (-2.9319)	0.22567** (-2.64452)	1.4650** (-5.5879)

ARDL (1, 0, 1, and 0) selected based on Hannan-Quinn Criterion

Residuals Diagnostic Checking

R-Squared 0.95365 R-Bar-Squared 0.91658

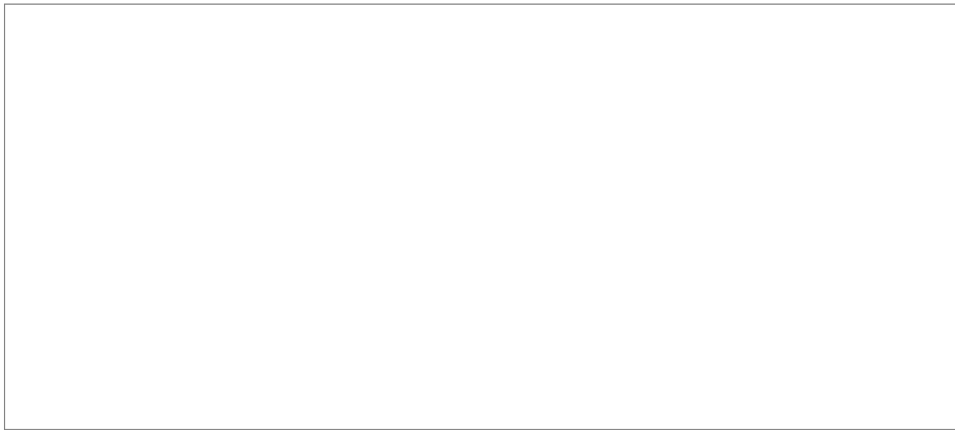
F ( 3, 6) 34.2939 [.000] DW-statistic 2.4583

The results from table 5 above reveals that the error correction term has a significant positive coefficient on the dynamic economic growth model implying that past changes in the economic growth will be corrected back to the stable equilibrium stage by the current changes.

In the Dynamic economic growth model with the dependent variable DlnGDP<sub>t-1</sub> the estimated coefficient of DlnEQ<sub>t-1</sub> is significantly positive implies that inequality of income rise together with rising economic growth. This implies that in the case of Nigeria, inequality of income does not take the inverted U shape Kuznet hypothesis. In addition, the estimated coefficient of DlnCC<sub>t-1</sub> is significantly positive. This implies that corruption has a negative impact on economic growth in other word

corruption in Nigeria is damaging to economic growth because an increase in the CPI scores means a decrease in corruption. In the dynamic inequality of income equation the estimated coefficient of the  $D\ln GDP_{t-1}$  is significantly positive, indicating that increase in economic growth will cause and increase in inequality of income. Lastly, in the corruption dynamic equation the estimated coefficient of  $D\ln GDP_{t-1}$  is significantly negative. Indicating that an increase in economic growth will cause a decrease in corruption in Nigeria, this is an interesting revelation to the Nigeria economy that fighting corruption requires economic resource. Though the evidence of reverse causality does not solve an intense dispute on the direction of the relationship between economic growth and corruption this remain inconclusive.

### **Figure 1. Stability Test of the Residuals**



From figure 1 the sensitivity test was carried out and the result suggests that the parameters of economic growth has passed the test. In other words there is stability in the coefficient of economic growth. Following the decision rules that the CUSUM and CUSUMSQ of the GDP per-capita of income are found to have parallel lines within the 5% level of significance and does not crossed each other.

### **5: Conclusions**

This study examines the competing corruption growth hypothesis by including inequality of income. The study addresses the methodological issues through the application of the ARDL approach to co-integration. The results indicate that corruption in Nigeria is negatively affecting economic growth in other word corruption is damaging the growth of the Nigerian economy. On the inequality of income the results suggest that inequality of income increases with economic growth. This implies that the structural shift in the process of economic growth in Nigeria does not follow the common assumption in the economic theory which say that when an economic growth process generates movement of labor from low productivity agriculture to the high productivity industrial sector this will improve the income and welfare of the labor force and caused a client in the inequality of income. This also suggests in the case of Nigeria inequality of income is moving with economic growth. We therefore, recommend that for effective policy, careful understanding of different types of corruption and their linkage to economic growth is important as each type of corruption deserves different types of policy subscription. Specific governance capacities are required in Nigeria that can enable state to enforce specific critical governance's capacities on critical sectors that are growth enhancing. Economic growth needs to be propoor and inclusive.

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