DOES CORRUPTION MATTER FOR NIGERIA LONG RUN GROWTH: EVIDENCE FROM COINTEGRATION ANALYSES AND CAUSALITY TESTS?

Olubanjo Taiwo Ajilore, Obafemi Awolowo University
D.O. Elumilade, Obafemi Awolowo University

ABSTRACT

The study examines the relationship between corruption and economic growth in the Nigeria economy for sample periods ranging from 1970 to 2004. Johansen's maximum likelihood cointegration techniques and Granger causality tests were applied to annual, national-level data. The results of this study indicate that corruption is cointegrated with Economic growth in Nigeria. In addition, for Nigeria, the study found a one-way causality from corruption to economic growth. These findings provide a statistical confirmation of unfavorable effects of corruption on economic performance as widely hypothesized in economic literature. For policy, the results of this study suggest that the current anti corruption drive in the country should be more vigorously pursued as this result indicated that it has important consequence on economic growth aspirations of the country.

INTRODUCTION

Corruption is a modern scourge that has become endemic in many societies, both developed and underdeveloped. Corruption is one of the most harmful phenomena of the age, its devastating social consequences threatening the safety and security of peoples, states and democratic institutions. This becomes more worrisome for most countries of Sub Saharan African (SSA) with reputation for enshrined institutionalized corruption that has become widespread to the extent that it is no longer considered an exception but the rule. The Nigeria economy has a reputation of being corrupt. Transparency International (TI) rated Nigeria the world's third most corrupt nation; it as well accused the country of being on the lead of African nations allegedly slowing down the fight against corruption in the continent. Raymond Baker, in a paper Money Laundering and Flight Capital: The Impact on Private Banking, wrote: "the biggest single thief in the world in the 1990s was almost certainly the late military dictator, Sane Abacha, with $12 to $16 billion passing out of Nigeria in corrupt and tax evading money during his murderous five year regime." Startling revelations of corrupt practices by key operators at all levels and arms of current Nigeria's fledging democracy point to the fact that corruption still poses serious threat to national survival.

The purpose of this paper is to seek an empirical understanding and an addition to current literature on the association between corruption and economic growth by using cointegration analyses to examine the relationship between these phenomenons in Nigeria. This method is quite common in the area of economics and finance in general, but has not been applied extensively to the study of corruption. In addition, causality tests will be performed to the Nigerian economy data to examine a causal link between corruption and economic growth.

The rest of the paper is organised as follows: Section two provides an outline of theoretical linkages between corruption and economic growth. It also contains a review of relevant empirical literature in the area. Section three examines definitional and measurement issues in empirical analyses of corruption. An operational measure of capital flight as a proxy for corruption in the Nigerian economy used in the study is also described in section three. Section four set out the methodological framework for the study. The

framework established in section four is subjected to econometric analysis in section five and section six concluded with summary and policy implications of the main findings.

THEORETICAL AND EMPIRICAL LITERATURE

Much of the concern over corruption in recent years has dealt with its effects upon economic development; hence, literature is replete with theoretical and empirical evidences on the relationship between corruption and economic growth. The general conclusion is that corruption slows down the long-term growth of an economy through a wide range of channels. Corruption is both a tax and source of uncertainty to investment decisions, and both diminish incentives to invest. Businesspersons interpret corruption as a species of tax. This is because they are often aware that a bribe is required before an enterprise can be started and, in addition, corrupt officials may also lay claims to part of the proceeds from the investment. In addition, since corruption is shrouded in secrecy, they face the uncertainty that the corrupt official will not fulfill his part of the bargain. Mauro (1995) presents some strong empirical evidence to help prove the negative relationship between corruption and long-term growth. Wei (1997) argues that corruption is much more costly than ordinary taxes because it generates uncertainty in addition to the tax burden.

Corruption is a form of seeking economic rents by creating artificial limitations. Every day private firms spend vast amounts of money attempting to convince legislators to grant monopolies or otherwise restrict competition so that some industry or individual can realize a rent. Throughout the world bureaucrats and people in authority are indefatigably maneuvering to position themselves in a tiny monopoly where they can be bribed for issuing a license, approving an expenditure, or allowing a shipment across a border. Studies have shown that these rent-seeking activities exact a heavy economic and social toll. Since rent seeking is often more lucrative than productive work, talents will be misallocated. Financial incentives may lure the more talented and better educated to engage in rent seeking rather than productive work, which in turn results in adverse consequences for the country's economic growth. Ehrlich and Lui (1999) present a balanced growth model to show that in some equilibrium officials spend a substantial amount of time and effort in seeking and accumulating political capital, which is not socially productive.

One specific channel through which corruption may harm economic performance is by distorting the composition of government expenditure. Corrupt politicians may be expected to spend more public resources on those items on which it is easier to exact large bribes and keep them secret, for example, items produced in markets where the degree of competition is low and items whose value is difficult to monitor. Corrupt politicians might therefore be more inclined to spend on fighter aircraft and large-scale investment projects than on textbooks and teachers' salaries, even though the latter may promote economic growth largely than the former. Mauro (1998) concludes that corruption affects the composition of government expenditure. When corruption is serious, there is much less government expenditure on education than on large infrastructure and defense projects. In addition, Mauro finds that corruption also lowers the quality of infrastructure projects and pubic services.

Definitional and Measurement Issues

Corruption is an illicit activity and hence is difficult to define, conceptualize, and measure. Corruption is defined in the literature in a variety of ways. When viewed from the perspective of public interest, corruption is defined as "the abuse of public power for private gain." From the political-economy angle, it is described as “charging of a price for the provision of a public service in excess of the official tariff.” When corruption is viewed as a behavioral phenomenon, it is defined as engaging in activities deemed illegal by society. Thus it becomes difficult to reduce the phenomenon to a single definition as it covers such a vast and growing assortment of activities which may include, but are not limited to, drugs

trafficking, money laundering, corporate crime, arms sales, sex trade and abuse, art and antique fraud, human trafficking, capital flight, etc. The only common denominator linking these activities together is that they are all undertaken outside the legality of the system.

Corruption is a classic example of an observable phenomenon that is not quantifiable since there cannot be statistics on a phenomenon, which by its very nature is concealed. Corruption is usually a clandestine activity and frequently does not have a direct victim. Moreover, those with knowledge of a corrupt act generally have an interest in concealing it. A related complication, as argued by Rose-Ackerman (1999) and Lamsdoff (1999), has to do with what is meant by "levels" of corruption. Is it the number of corrupt actions over time, the size of the stakes involved or the level of government at which they occur? For these reason corruption remains impossible to measure directly.

Attempts to measure corruption have involved several approaches. These include perception-based corruption indices, which draw upon opinion surveys and expert estimates of how corrupt various countries are. This index is widely associated with the Transparency International's Corruption Perception Index (Transparency International, 2001). Schlessinger and Meir (2002) made comparisons based upon arrest or conviction data for corruption offences. PriceWaterhouseCoopers (2001), provides an hybrid approach, known as the "Opacity Index", which incorporates a multi-component indices perceptual ratings of hard economic and social data and indicators such as interest premiums paid on sovereign debt by nations with transparency problems.

While these perceptual scales have helped in understanding the cause and effects of corruption, as well as put pressure on governments and society to address the corruption problem, they are obviously imperfect owing to their subjective nature. Perception data are just estimates of how corrupt a society are thought to be, and are thus open to influence and distortion from full range of factors affecting any human judgments. The more obvious limitation of these data sets is that it treats whole societies as units of analysis, and thus it becomes far removed from analysis that have specific country or provinces as focus. There are no obvious answers to these problems, yet finding useful ways to compare level of corruption over time remains a necessity for an empirical focused study such as the present study that need good data for building models and testing hypotheses.

The Measure of Corruption Used in This Study

To address the problems highlighted in the previous section, this paper adopts the residual method estimates of capital flight as a proxy for corruption in Nigeria. Klitgaard, Maclean-Abaroa and Parris (2000) contend that the most useful approach in measuring corruption is to track changes in aspects of governance that create incentives for corruption, or reveal its effects or both. One such incentive in Africa is the globalization of markets and developmental inequalities that have engendered cross-border corruption involving international interests, actors, capital and economic processes. Ample empirical evidence has demonstrated that incentives for cross-border corruption in form of illegal external capital / asset accumulation, or what economists term capital flight is associated with large-scale corruption among African leaders. Bardhan, (1997) opined that it is plausible that certain types of capital flight, defined as transfer of money abroad, usually in US dollars, often under questionable circumstances are functions of the government, or worse still governmental corruption.

Boyce and Ndikumana (2002) noted that in most African countries, instead of financing investment or consumption with public funds, a substantial fraction was captured by African political elites and channeled abroad in the form of capital flight. Through this process public funds, as well as public external debts (contracted via borrowing by African government or by private firms with government guarantees) were transformed into private external assets. Activities and actions of political office holders, especially the military elites, in Nigeria in the last three decades perfectly fits in the mechanisms

by which resources are channeled abroad as capital flight. These include embezzlement of borrowed funds, kickbacks on government contracts, trade mis-invoicing, misappropriation of revenues from state-owned enterprises and smuggling of natural resources. As the government they headed incurred large external debts, a number of individual military rulers amassed large personal fortunes. A substantial part of which were held abroad. For instance, the Swiss bank accounts of the family of General Sani Abacha, who ruled Nigeria for five years, reportedly contain as much as $2billion US dollars at the time it was frozen in 1999 (Onishi, 1999). In addition, a US Senate enquiry in the same year revealed that the Abacha family also held multi-million dollar accounts with Citibank in London and New York (Gerth, 1999; O'Brien, 1999).

The residual method measures capital flight indirectly by comparing the sources of capital inflows (i.e. net increases in external debt and the net inflow of foreign investment) with the uses of these inflows (i.e., the current account deficit and additions to foreign reserves). This approach starts from the standard balance of payments framework. In principle, if the balance of payments statistics were to be used (reported by the International Monetary Fund Balance of Payments Statistics), the uses and sources of funds should be equal. However, since these statistics may not accurately measure flows, and in particular private capital flows, World Bank statistics on the change in the external debt are used instead. If the sources, calculated by using World Bank debt data, exceed the uses of capital inflows, the difference is termed as capital flight. The residual method acknowledges the difficulties of separating abnormal from normal capital outflows and, therefore, measures all unrecorded private capital outflows as being capital flight.

According to the residual method, capital flight is calculated as follows:

$$KF_r =)ED + FI - CAD -)FR \quad (1)$$

where KF_r is capital flight according to the residual method, $)$ denotes change, ED is stock of gross external debt reported in the World Bank data, FI is the net foreign investment inflows, CAD is the current account deficit and FR is the stock of official foreign reserves. Annual data series on these variables for the period 1970 to 2004 are sourced from International Financial Statistics (IFS) publications of the International Monetary Fund (IMF)

METHODOLOGY, DATA AND ESTIMATION TECHNIQUES

We set out a simple model to test for the existence of any long-run relationship and potential causality between corruption and GDP growth rate. Equation 2 specifies our simple model:

$$LRGDP = \alpha + \beta LCORt + Ut \quad (2)$$

Where LRGDP denotes the logarithm of real GDP, α and β are estimated constants and LCOR is the logarithms of the *capital flight* proxy for corruption estimated from equation (1). For modeling purposes, the variables are in natural logarithms; thus, the first differences can be interpreted as the rate of growth.

The study analyzes the link between corruption and economic growth in a time series data of Nigeria for the 1970-2004 periods, via the cointegration tests and granger causality analyses. The data on corruption is proxy by an estimate of capital flight flows from Nigeria. The data, sources and estimates of capital flight are as presented in section 3.1. Economic growth is proxy by the percentage rate of growth of real gross domestic product. Data on this variable is sourced from Statistical Bulletin publications of the Central Bank of Nigeria.

Co-integration analysis provides potential information about the long-term equilibrium relationship of the model. It is now widely recognized following Granger and Newbold (1974) that most economic series exhibit a non-stationary (unit-root) pattern in their levels, i.e. the means and variances are time dependent and such variables are said to be I(1) (Holdenand Perman, 1994). The implication is that all computed statistics in a regression model, which use these means and variances are also time dependent. It implies that such variables fail to converge to their true values as the sample size increases (Rao, 1994). If, after differencing, the variables become stationary then they are referred to as being I(0). The technique of co-integration is not only essential, but also necessary in estimating an equilibrium relationship with unit root or non-stationary variables to determine the presence of a long-run relationship.

Appropriate tests to determine whether a time series is integrated of order one against the alternative of zero order integration include those developed by Fuller (1976), Dickey and Fuller (1981), Phillips (1987), and Perron (1988) and others. In addition, there are various approaches to estimating cointegrating regressions. Two broad approaches are available: (a) Engle-Granger (1987), (b) Johansen (1988), and Johansen-Juselius (1990). The approach developed by Johansen (1988) and Johansen-Juselius (1990), which is based on the full information Johansen Maximum Likelihood method (JML) is preferred and used in this study. The first approach is popular due to its simplicity and ease of calculation. However, there are some problems with the Engle and Granger (1987) procedure. With the Engle-Granger approach, the estimation of the long-run equilibrium regression requires that the researcher place' one variable on the left-hand side and use the other as regressors. For example, in the case of two variables, it is possible to run the Engle-Granger test for co-integration by using the residuals from either of the following two 'equilibrium' regressions:

$$y_t + \beta_{10} + \beta_{11} z_t + e_{1t} \quad \text{and} \quad z_t + \beta_{20} + \beta_{21} y_t + e_{2t}.$$

However, a problem arises from finite samples. As the sample size increases, asymptotic theory indicates that the test for a unit root in the first error sequence becomes equivalent to the test for a unit root in the second error sequence (Enders, 1995). Furthermore, it is possible to find that one regression indicates the variables are co-integrated, whereas reversing the order indicates no cointegration (Enders, 1995). The VAR approach considers this possibility and treats all variables as potentially endogenous. Moreover, recent Monte Carlo evidence strongly favors the Johansen Maximum Likelihood method (JML) approach over the Engle-Granger's (Dejong, 1992). The Hypothesis is that "If variables are co-integrated, they share a long-run relationship and will move closely together over time."

Johansen's approach is to estimate the Vector Error Correction Mechanism (VECM) by maximum likelihood, under various assumptions about the trend or intercept parameters and the number r of cointegrating vectors, and then conduct likelihood ratio tests. Assuming that the VECM errors U_t are independent $N_k[0,S]$ distribution, and given the cointegrating restrictions on the trend or intercept parameters, the maximum likelihood $L_{max}(r)$ is a function of the cointegration rank r. Johansen proposes two types of tests for r:

The lamda-max test: This test is based on the log-likelihood ratio $\ln[L_{max}(r)/L_{max}(r+1)]$, and is conducted sequentially for $r = 0,1,..,k-1$. The name comes from the fact that the test statistic involved is a maximum generalized eigenvalue. This test tests the null hypothesis that the cointegration rank is equal to r against the alternative that the cointegration rank is equal to $r+1$.

The trace test: This test is based on the log-likelihood ratio $\ln[L_{max}(r)/L_{max}(k)]$, and is conducted sequentially for $r = k-1,...,1,0$. The name comes from the fact that the test statistic involved is the trace (= the sum of the diagonal elements) of a diagonal matrix of generalized eigenvalues. This

test tests the null hypothesis that the cointegration rank is equal to *r* against the alternative that the cointegration rank is *k*. The latter implies that X_t is trend stationary.

Both tests have non-standard asymptotic null distributions. Moreover, given the cointegration rank *r* Johansen also derives likelihood ratio tests of the cointegrating restrictions on the intercept or trend parameters.

In addition to cointegration analyses, this study also conducts the Granger causality tests of the same variables to detect any causal link between economic performance and corruption. Traditionally, causality tests between two stationary series are based on Granger's (1969) definition for causality. Formally, series y_t "Granger-causes" series x_t if series x_t can be predicted better by using past values of series y_t than by using only the historical values of series x_t. In other words, y_t fails to Granger-cause x_t if, for all s > 0, the conditional probability distribution of x_{t+s} given $(x_t, x_{t-1},...)$ is the same as the conditional probability distribution of x_{t+s} given both $(x_t, x_{t-1},...)$ and $(y_t, y_{t-1},...)$. That is, y_t does not Granger-cause x_t if : $Pr(x_{t+s}|\boldsymbol{X}_{t,-l}) = Pr(x_{t+s}|\boldsymbol{X}_{t,-l},\boldsymbol{Y}_{t,-l})$ where $Pr(\cdot)$ denotes conditional probability, $\boldsymbol{X}_{t,-l}$? $(x_t, x_{t-1},..., x_{t-l})$ and $\boldsymbol{Y}_{t,-l}$? $(y_t, y_{t-1},..., y_{t-l})$. Granger (1969) proposes the test for causality between x_t and y_t by running a set of regressions:

$$X t = \theta 0 + \sum_{i=1}^{n} \theta a i x t-i + \sum_{i=1}^{n} \theta b i y t-i + u t \qquad 3$$

$$y t = \theta 1 + \sum_{i=1}^{n} \theta a i x t-i + \sum_{i=1}^{n} \theta d i y t-i + v t \qquad 4$$

where a_0 and a_1 are constants, a_i, b_i, c_i, and d_i are parameters, and u_t and v_t are uncorrelated error terms with zero means and finite variances. The null hypothesis that y_t (x_t) does not Granger-cause x_t (y_t) is rejected if the b_i (c_i) coefficients are jointly significantly different from zero, using a standard *F* test. Bi-directional causality (or feedback) exists if both the b_i and c_i coefficients are jointly different from zero.

EMPIRICAL ESTIMATION AND INTERPRETATION OF RESULTS

Unit Roots Tests

Before we estimate the equation, we determine the underlying properties of process that generate our time series variables, that is, a test of the stationary properties of the variables. Macroeconomic data often appear to possess stochastic trend that can be removed by differencing the variables. We use the Augumented Dickey Fuller (ADF) t-test for testing the order of integration. Assuming there is no trend, the ADF test can be formulated as follows:

$$\Delta y_t = \delta . y_{t-1} + \sum_{i=1}^{k} \delta . \Delta y_{t-1} + e_t \qquad 5$$

The null hypothesis being tested is that ∗ = 0 (random walk with a drift) against the alternative of stationarity. The results are as presented in Table 1. As shown in the table, the ADF test indicated that our series are non-stationary at their levels. However, all the first differenced series turn out to be stationary at the 5% level of significance, the critical value computed by McKinnon is -3.02. All the first differenced test results have t-statistics exceeding McKinnon's critical value, so that the hypothesis ∗ = 0 could now be rejected.

Table 1: Augmented Dickey Fuller Test of Unit Roots

Variables	**ADF Test Statistics**
A. Series in Levels	
RGDP	-2.5734
COR	-2.7548
B. Series in First Differences	
RGDP	-3.7424*
COR	-4.0426*

*ADF is the Augmented Dickey- Fuller test; it gives the t-statistics from a specification that includes a constant, trend and two (2) lagged changes in the dependent variable. A * indicates rejection of the null hypothesis (□ = 0) of non-stationarity at the 5% level of significance. MacKinnon critical value for rejection of a unit root for ADF at 5% is -3.02.*

Tests for Cointegration

We employed the Johansen Cointegration test to check for cointegration among the time series. This become necessary because our variables contain unit roots in the level, cointegration is the appropriate dynamic modeling technique for them. A linear combination of these variables is identified such that this combination is stationary. If such combination exists, then the variables are said to be cointegrated. If variables are co-integrated, they share a long-run relationship and will move closely together over time. This means that the difference between such variables was stable over time and there is some degree of convergence in the long run. The estimation of a VAR model requires the explicit choice of lag length in the equation of the model. Following Judge et.al (1988), Akaike's AIC criterion was used to determine the lag length of the VAR model. The chosen lag length is one that minimized the following: $AIC_{(n)} = \ln\det\Sigma_n + \{ 2d^2n\}/ T$…where d is number of variables, T is the sample size, and Σ_n is the estimate of the residuals of the variance-covariance matrix obtained with a VAR. The model that minimized AIC turns out to be the one with 2 lag lengths. It is hypothesized that there exists a long-run relationship between real GDP and corruption proxied with the residual estimate of capital flight from the Nigerian economy.

The results of the test are as shown in Table 2 below. Panel A reports the so-called trace statistics, while Panel B reports the maximal eigenvalue statistics. The first column shows the number of cointegration relations under the null hypothesis, the second is the ordered eigenvalue of the *II* matrix, the third column is the trace statistic, and the last columns are the 5% and 1% critical values. It should be noted that the (nonstandard) critical values are taken from Osterwald-Lenum (1992), which differ slightly from those reported in Johansen and Juselius (1990). The trace statistic tests the null hypothesis of r cointegrating relations against the alternative of k cointegrating relations, where k is the number of endogenous variables, for R = 0, 1,….., K – 1. Using these trace statistic, we test for the number of co-integrating relationship between LRGDP and LCOR. Given that we only have two variables, we expect that at least one cointegrating vector is present.

To test the null hypothesis r =zero against the general alternative r =1, or 2 we use the λ-trace statistic and the Eigen value. Since the null hypothesis is r=0 and there are two variables (i.e. n =2), the summation in the estimated equations runs from 1 to 2. The calculated value for the trace statistics is 19.95054 and comparing this calculated values to the critical values provided by Johansen and Juselius (1990), the null hypothesis of cointegration can be accepted at both 5% and 1% critical levels. Thus, at the 90% level, the restriction is binding and we conclude that the variables are cointegrated.

Table 2: Unrestricted Cointegration Rank Test

Panel A: Trace Statistics				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 Percent Critical Value	1 Percent Critical Value
None*	0.384686	19.95054	15.41	20.04
At Most 1 *	0.183172	19.95054	3.76	6.65
Panel B: Maximal Eigenvalue Statistics				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	5 Percent Critical Value	1 Percent Critical Value
None*	0.384686	19.95054	14.07	18.63
At Most 1 *	0.183172	5.867474	3.76	6.65

**(**) denotes rejection of the hypothesis at 5% (1%) significance level. Trace statistics indicates 2 cointegrating equation(s) at 5% (1%) significance level. Max-Eigen Statistic indicates 2 cointegrating equation(s) at 5% significance level*

Since the trace test has a very general alternative hypothesis, we need to test a more specific hypothesis. To do so, we apply the lambda-maximal test. Here we test the null hypothesis r=0 against the specific alternative of r=1. The calculated and critical values for n-r =2 is as shown in the table. The null hypothesis of cointegration can still be accepted at both 5% and 1% critical levels.

As reported in Table 2 above, both the trace and the maximal eigenvalues statistics show that the VAR has two cointegrating vectors. This implies that a long run relationship exists among the variables. Hence, the second cointegrating vector is normalized as the growth of real GDP. Thus, the result of the cointegrating vector is given as:

$$RGDP = 2.45 + 0.18COR$$
$$(0.261)$$

The standard error is indicated in parenthesis. The cointegrating vector indicated that long-run growth of real GDP in Nigeria is negatively and significantly related to levels of corruption. The coefficient suggests that an increase of corruption level by 1 million Naira would reduce economic growth by 18%. This finding provides statistical confirmation of the hypothesized negative impact of corruption on growth in economic literature.

Granger Causality Tests

The Granger causality test requires that all data series involved are stationary. Otherwise, the inference from the *F*-statistic might be spurious because the test will have nonstandard distributions. As shown in Table 1, both the real GDP and corruption series are shown to be I(1). Accordingly, the first-difference series are used to perform the Granger causality tests. The results of the tests are reported in Table 3.

Table 3: Granger Causality Tests Results

Dependent Variable	**F-Statistics**
Corruption	1.079
Economic growth	5.052*

Reported values are the F-statistics..
** Rejection of the null hypothesis at the 5% level of significance.*

In the corruption equation, there is no causal relationship from economic growth to corruption as the F-statistic was insignificant. In the long run, there is unidirectional causality running from corruption to economic growth as evidenced by statistical significance of F-statistic of the economic growth equation as shown in Table 3 above. Thus, it can be concluded that for Nigeria data, there is uni-directional causality between corruption and economic growth and the causal direction runs from corruption to economic growth.

SUMMARY AND CONCLUSION

A burgeoning empirical literature suggests that the absence of corruption accelerate economic growth, while anecdotal evidences confirmed that corruption is endemic in the Nigeria socio-economic and political polity. This paper therefore seeks an empirical understanding of the association between corruption and economic growth in Nigeria. We achieved this by applying Johansen's maximum likelihood cointegration method and Granger causality test for corruption and economic growth indices from the Nigerian economy, for sample periods from 1970 to 2004.

Both the trace and the maximal eigenvalues statistics show that a long run relationship exists between corruption and economic growth indices in Nigeria. The cointegrating vector indicated that long-run growth of real GDP in Nigeria is negatively and significantly related to levels of corruption. The coefficient suggests that an increase of corruption level by one million Naira would reduce economic growth by 18%. This finding provides statistical confirmation of the hypothesized negative impact of corruption on growth in economic literature.

The Granger causality tests support uni-directional causality between corruption and economic growth and the causal direction runs from corruption to economic growth to further lend credence to the results from cointegration analyses.

These findings provide empirical support for the postulates of negative growth impact of corruption on growth as contained in theoretical and empirical literature. Furthermore, the results of this study appear to suggest that cointegration analysis may be a fruitful way to investigate the issue. For policy, the results of this study suggest that the current anti corruption drive in the country should be pursued very vigorously as this result indicated that it has important consequence on economic growth aspirations of the country. The creation of popular expectations about standards of public service and the right to be free of corruption are important elements of an anti-corruption strategy.

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