Original Research Article

Does Corruption and Institutional Quality Impede Economic Performance in Nigeria?

Abstract

This study empirically interrogated the nexus among corruption, institutional quality and economic performance with the objective of determining if economic performance is impeded by corruption and institutional quality in Nigeria. The autoregressive distribution lag (ARDL) technique was employed to test the short-run and long-run relationship among the variables of interest. The data used for the analysis were obtained from the World Development Indicators and the Central Bank of Nigeria's Statistical Bulletin for the period 1970 to 2020. The study found that corruption has a negative and significant impact on economic performance in the long-run. In contrast, institutional quality was found to have a negative but insignificant effect on economic performance. This finding implies that despite the establishment of institutional structures and enactment of stringent laws to curb corruption, Nigeria still witnesses a decline in economic performance. As such, Nigeria has weak institutions and regulations to fight corruption. Contrastingly, the study revealed that human capital, trade openness and the working population exerted positive and significant impacts on economic performance. By implication, the Nigerian economy reacts positively to changes in human capital development, trade openness and working population in the long-run. This suggests that, with the availability of appropriate policies and resources, human capital development, trade openness, and population growth have the potential to enhance Nigeria's economic performance in the long-run.

Keywords: Corruption, Institutional Quality, Economic Performance, Nigeria and Autoregressive Distribution Lag (ARDL).

JEL Codes: B22, C19, C33, O43

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1. Introduction.

The consequences of corruption and institutional quality on national economies have been a subject of debate in economic literature in recent years [1]. The World Bank estimates the cost of corruption to the global economy as 1 trillion US Dollar per annum. The cost of corruption for Africa is estimated at 25% of the continent's gross domestic product GDP. While that of Nigeria is estimated to rise to 37% of the nation's GDP by 2030 if the hydra-headed menace is not curtailed. In the economic and social literature, there is an ongoing debate about the effects of corruption on economic performance. Some notable scholars [2, 3] who are the advocates of sand in the wheels' hypothesis contend that corruption stifles economic performance by destroying innovative activities because innovators need government-supplied goods which are exclusively provided by state institutions such as licenses, permits, and import quotas, more than established producers do. The demand for these commodities is high and inelastic; therefore, they become a primary target for corruption. On the flip side, the advocates of the grease to the wheels hypothesis contend that corruption could boost economic performance [4, 5]. They explained that corruption serves as compensation for bureaucrats, which enforce more effective and efficient facilitation of essential government services, and it provides a leeway for entrepreneurs to bypass inefficient government regulation.

Institutional quality is a broad concept that encompasses individual rights, the rule of law, and high-quality state regulations and services [6]. Institutional quality and economic performance reinforce each other on a long-term basis. However, some argue institutional quality leads to a vicious cycle of economic performance. Notably, rising standards in institutions open economic potentials and do not intrinsically suffer from diminishing returns [7]. Corruption and institutional failures swallowed about 40 percent of Nigeria's $20 billion annual oil income [8].

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Other adverse consequences of corruption and weak institutional quality on the Nigerian economy are dwindling level of investment, declining revenue profile, decreasing level of Foreign Direct Investment, and loss of viable businesses by Nigerians. Corruption and weak institutional quality lead to civil unrest, business failure, and unemployment, diminishes national prestige and respect, and above all, poor economic performance [8]. Since the 1960s, Nigeria has been bedevilled by the challenge of corruption and has been poorly rated in terms of institutional quality. Yet, the nation still managed to record impressive economic performances at some periods while the economy also suffered a decline in some other periods [9, 10, 11).

Considering the ongoing debate in literature and lack of consensus among scholars on how corruption and institutional quality affects economic performance, this study is motivated by the quest to investigate the mediating role of institutional quality on the relationship between corruption and economic performance in Nigeria by adopting an objective based approach in the measurement of corruption. Extant theoretical and empirical studies [12, 13, 14, 15] employed subjective and perception-based approach in the measurement of corruption. However, this study bridged the gap identified above by adopting an objective-based approach to measure corruption. The choice of an objective approach is based on its ability to look at the actual activities connected to corruption, and it is considered being more reliable [16]. Beyond the adoption of an objective-based approach in measuring corruption, this study widened the analytical gaze of corruption by employing a monetary approach to the objective-based measurement of corruption by using a composite variable comprising of different measure of corruption as an indicator for corruption [17]. This proposition is necessitated by the inherent transactive and extortive corrupt practices of bank officials and parallel market operators in the country.

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The second part of this study presents the literature review. The third and fourth parts deal with the methodology and discussion of results, while the fifth and sixth parts present the conclusion and policy implications.

2. Literature Review

- Empirical Literature

2.1 Corruption, Institutional Quality and Economic Performance Nexus

There is a conflicting report on the nexus between corruption, institutional quality and economic performance in the developed countries and developing economies to which Nigeria belongs. Some of the empirical studies show that corruption and institutional quality have a negative effect on economic performance [18, 19, 20, 21, 22, 23] as asserted by [24, 25]. Nevertheless, there have been reports of the positive effect of corruption and institutions on economic performance in some other studies [26, 27, 28, 29, 30]. This indicates a need to conduct further investigation in this research space to contribute to the ongoing debate about the effect of corruption and institutional quality on economic performance. Previous studies have extensively tested the direct effects of corruption, institutional quality, and the transmission channels through which corruption and instructional quality affect economic performance over the past few decades. Presented in Table 1 summarises the empirical evidence reviewed in the literature.

		Table 1: Summary of Empirical Evidence				
		Corruption, Institutional Quality and Economic Performance				
	Type of Data	**Method of Analysis**	**Variables**	**Reported effect**	**Weaknesses or Limitations**	**References**
1	Cross-country data of 58 developing countries 1980-1985	OLS	Red-tape, political stability, investment, per capita GDP	Insignific ant negative impact	The adoption of a subjective & perception based approach in the measurement of corruption is a critical analytical weakness	Mauro (1995)
2	Cross-country data from 101 to 1980-1985	OLS, 2SLS	Government expenditure on Education, Per capita GDP	Negative	The heterogeneity in the measurement of the variables found in the databases and used in the statistical analyses	Mauro (1996)

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3	Cross-country data of all countries of the World 1980-1995	OLS	Real per capita GDP, Public Investment-GDP ratio	Negative	The choice OLS as the post estimation techniques.	Tanzi and Davoodi (1998)
4	Panel data of 68 countries 1981-1992	OLS	GDP Per capita, Population growth, trade, Investment	Negative	No corruption measures were available for the command economies of former communist countries which were part of the study.	Ehrlich and Lui (1999)
5	Panel data of 25 transition economies 1994-1998	OLS	Structural reform factor, Inflation	Negative	Conceptualised corruption from global institutions viewpoint, which is described as mere technocratic	Abed and Davoodi (2002)
6	Cross-section of 84 Latin-American, African and Scandinavian countries 1960-2000	OLS	Population growth, investment, secondary school education, instability	Positive	Use of the time tax as a specific outcome of the institutional inefficiencies linked with corruption.	Méndez and Sepúlveda (2006).
7	Panel data of 61 LDCs 1980-1998	OLS	Income distribution, Per capita income and Regional dummies	Negative	The index of corruption used in the study is based on the *perception* of corruption. the index does not indicate whether corruption is organised or not, centralised or decentralised.	Gyimah-Brempong and Camacho (2006)
8	Panel data of 60 countries 1995-2004	OLS	Democracy, per capita income, employment	Positive (conditional on high Economic Freedom)	Reliability of the measurement of corruption used in this study is a critical methodological limitation.	Swaleheen and Stansel (2007)
9	Panel data of 83 countries 1995-2005	OLS	Political institutions, Democracy	Positive (conditional on low Economic Freedom)	The measures of corruption adopted in the study limits its ability to measure the specific forms of corruption occurring in different countries.	Heckelman and Powell (2008)
10	Panel data 1999-2004 all countries in the world	OLS		Positive	There are methodological issues on the reliability and comparability of CPI data used across all countries investigated in the study.	Podobnik et al. (2008)
11	60-80 countries 1970-2000	OLS	Initial GDP, Education, Population Growth, Investment	Negative	Reliability of the measurement of corruption used in this study is a critical methodological limitation.	Aidt (2009)
12	Meta-study	OLS, 2SLS, 3SLS, GMM	Investment, Population growth, GDP per capita	Negative	The study ignored the indirect effects of corruption on growth. The problem of multicollinearity was identified in the analysis	Ugur and Dasgupta (2011)

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13	Nigeria 1990-2010	OLS	FDI inflows, Gross fixed capital formation & Government Expenditure	Positive	The study failed to consider the role of institutional quality in corruption and growth.	Odubunmi and Agbelede (2014)
14	Nigeria 1980-2011	OLS	Government spending, Gross fixed capital formation, and Human Capital	Negative	Adoption of a subjective & perception based approach in the measurement of corruption.	Ogunlana *et al.* (2016)
15	Bangladesh 1984-2013	ARDL Bound Test	Domestic Investment, Government final consumption Expenditure and Human Capital	Negative	The use of International Country Risk Guide's (ICRG) corruption index as the proxy to measure the degree of corruption, which is subjective measure is methological limitation.	Pulok and Ahmed (2017)
16	Panel Data from Economic & Monetary community of central Africa (EMCCA) 2005-2015	OLS	Human capital, private investment, civil liberty, commercial opening & public spending	Negative	The measures of corruption in the study limit its ability to measure the specific forms of corruption occurring in different countries.	Ondo (2017)
17	Portugal (1980-2018)	VAR	GDP per capita, Gross Fixed Capital Formation, Total factor productivity	Positive but statistically not significant	Adoption of a subjective & perception based approach in the measurement of corruption.	Bacao *et al.* (2019)
18	Panel data of MENA countries	OLS	Private investments, Public Investment, Trade openness, External debt, Money supply, Trade balance and inflation rate.	Negative	The OLS technique is an inadequate analytical tool for a cross-country study of the magnitude	Sbaouelgi (2019)
19	Panel data of BRICS Countries	GMM	Investment, Literacy rate, population growth rate, Government consumption, Trade openness, Political stability & Real per capita income	Positive	The measure of corruption in the study limits its ability to measure the specific forms of corruption occurring in different countries.	Bitterhout and Simo-Kengne (2020)

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20	Nigeria 1987-2017	Seemingly Unrelated Regression (SUR) model	Per capita income, Gross fixed capital formation, Gross national saving, Human capital & Government expenditure	Negative	Adoption of a subjective & perception based approach in the measurement of corruption.	Lawal and George (2020)
21	Panel data of 34 OECD Countries 1999-2014	DOLS	Household consumption expenditure Growth, Investment Growth, Government Expenditure, Net Export, Human capital and Political Stability.	Negative	The study used corruption perception index as a measure of corruption which is subjective in nature as it fails to recognise the political, social and cultural challenges confronting countries in its computation	Linhartova and Zidova (2016)
22	Panel data of 88 Countries 1984-2011	OLS	FDI, Inflation and Trade Openness	Positive but negative beyond a particular threshold	The index of corruption used in the study is based on the *perception* of corruption. the index does not indicate whether corruption is organised or not, centralised or decentralised.	Trabelsi and Trabelsi (2020)
23	Panel data of South Asian Economies 2002-2017	Robust Least Square (RLS)	Financial Development, Trade Openness, Institutional quality and Political Stability	Positive	The study used corruption perception index as a measure of corruption which is subjective in nature as it fails to recognise the political, social and cultural challenges confronting countries in its computation	Khan *et al.*(2020)
24	Vietnamese data set 2000-2012	OLS	Human capital, government investment, private investment and institutional quality	Negative	The use of a subjective & perception based approach in the measurement of corruption is a	Anh *et al.* (2014)
25	Panel data of Five selected (SSA) countries 1990-2015	Dynamic OLS	Domestic investment and external debt	Positive	Completely ignored the mediating role of institutional quality in the relationship between corruption and economic performance.	Shitta *et al.* (2018)
26	Indonesia 2004-2015	2SLS	Private investment, government investment, consumption expenditure, trade openness and human capital	Negative	Defined corruption from the global institution perspective, which is mere technocratic in nature.	Alfada (2019)

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27	Cross-sectional and panel data 2000-2011	OLS	Investment, Government consumption expenditure, literacy rate, human capital, trade openness, freedom status and executive recruitment quality	Positive	The measures of corruption in the study limit its ability to measure the specific forms of corruption occurring in different countries	Chakravorty (2019)
28	Nigerian data set 1999-2016	Classical linear regression model (CLRM)	The unemployment rate, inflation rate and exchange rate.	Positive	The use of a subjective & perception based approach in the measurement of corruption.	Udo et al.(2018)
29	Panel data of 146 countries 1984-2009	System generalised methods of moments (SGMM)	Human capital, population growth rate, government final consumption expenditure, investment and trade openness.	Positive	The study used corruption perception index as a measure of corruption, which is subjective in nature as it fails to recognise the political, social, and cultural challenges confronting countries in its computation.	Mallik and Saha (2016)
30	Panel data of 20 developing countries 1996-2018	Panel ARDL	Public investments, real interest rate, inflation rate, FDI inflows, population growth and consumption expenditure	Negative	The index of corruption used in the study is based on the *perception* of corruption. the index does not indicate whether corruption is organised or not, centralised or decentralised.	Ibrahim (2020)
31	Cross-sectional data for 101 developing countries 2009-2015	OLS	GDP per capita, investment, inflation, trade openness and political stability	Negative	The use of a subjective & perception based approach in the measurement of corruption.	Agale-Kolgo (2018)

Source: Compiled by Author (2022)

2.2 Theoretical Foundation

-The Endogenous Growth theory

The endogenous growth theory propounded by [31] and [32] led to renewed interest in economic growth analysis. An essential advantage of the endogenous model over traditional growth models is that, through the assumption of constant or increasing returns to a factor input, in particular human capital, it is possible to define the absence of income and growth convergence between

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countries and to account for more fully for the residual factor in Solow-type analyses. The "growth accounting" exercises, popularised by Barro and others [33, 34, 35], fall within the generalised Solow-type growth model. The essential feature of this approach is the inclusion of various indicators of economic structure. Most empirical research using this approach has found evidence of "conditional" convergence, where convergence is conditional on the level of availability of complementary forms of investment, including human capital and a supportive policy environment. This suggests that developing countries' failure to converge on the income levels of developed countries may be attributed to institutional factors.

More importantly, variants of endogenous growth theories, including [32] Model, [36] Model, AK models of [37] and others, have demonstrated that policy variables can have a significant impact on long-run economic growth. This study adopted the [36] growth theory, which is an off-shoot of [31] theory. This is because the theory model permits the inclusion of a broader range of policy variables, including corruption and institutional quality. This theory provides both the theoretical foundation and analytical tool for examining the impact of corruption and institutional quality on economic performance in Nigeria. The theory assumes that the economy comprises the public sector (G) and the Private sector (P). Since the investment by the public sector in infrastructure can make the private sector more profitable, it is assumed that the output of (G) exerts some externalities on the output of the private sector. The model also assumes that the government levies an income tax and runs a balanced budget. It uses a production function of the form.

$$Y = G\beta K^{\alpha} L^{1-\alpha} \quad \text{..... (1)}$$

Where: Y = Total output of the economy

G = Public sector input

K = Private physical capital

L = Labor input

α = Contribution of capital to aggregate output

1- α = Share of output per worker

β = Contribution of the public sector to aggregate output

G = tY (the government is assumed to levy tax and run a balanced budget)

$tY = tG\beta K^{\alpha} LI^{-\alpha}$.

The production function of the Public Sector (G) is given as:

$G = g(Lg, Kg)$..... (2)

While that of the Private Sector is given as:

$P = p(Lp, Kp, G)$..... (3)

The Total factor inputs

$LT = Lg + Lp$..... (4)

$KT = Kg + Kp$..... (5)

Subscripts g, p and T, relate to the input of the public sector, private sector and aggregate economy.

Since the total output of the economy is a function of output in both the public and private sector

$Y = g(Lg + Kg) + p(Lp + Kp + G)$ ..... (6)

$Y = Lg + Lp + Kg + Kp + G$.

The model is modified in this study to include corruption; therefore, we have

$Y = KT + LT + G + C$..... (7)

$Y = \alpha KT + (1 - \alpha LT + \beta G + \lambda C$..... (8)

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Following the endogenous growth model, the emergence of two schools of thought connected to the effects of corruption on economic performance is identified in this study. One of the schools of thought embraces the fact that corruption leads to public sector efficiency and has a positive influence on economic performance because approval of projects are speedily given when bribes are paid to bureaucrats [26, 27, 28, 29, 30]. The second school of thought holds that corruption impede economic performance, increases transaction costs and reduces profits in business [18, 19, 20, 21, 22, 23].

3.0 Methodology

3.1 Sample and Data

This article used annual time series data spanning 50 years between 1970 and 2020 for its empirical analysis. The independent variables comprise corruption index obtained from the Transparency International (TI) data base. Contract intensive money (CIM) was used as the indicator of institutional quality. It is described as the degree to which a country's laws protect private property. The data was obtained from the Central Bank of Nigeria (CBN) data base. Investment was measured as capital formation as a percentage of GDP, government expenditure was measured as government consumption expenditure as a percentage of GDP, human capital was measured as human development as a percentage of GNI. Trade openness was measured as a trade as a percentage of GDP while working population was measured as the percentage growth rate of the working force. The data for the depended variable real gross domestic product growth rate and that some of the independent variable such as investment, government expenditure, human capita, and trade openness and population growth were all obtained from the published dataset statistics of the World Development Indicators of the World Bank.

- **3.2 Data Analysis Techniques**

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The empirical analysis in this study includes the preliminary analysis, estimation and post estimation. The preliminary analysis includes descriptive statistics, unit-roots test and co-integration test. Regarding the co-integration test (bounds co-integration test) and estimation, the study employed Autoregressive Distribution Lag (ADRL) to examine the short-run and long-run relationships. There is evidence of a long-run relationship if the computed F-statistics exceed the upper bound critical value. However, there is no co-integration if the F-statistic is below the lower bound, while the result will be inconclusive for a value within lower and upper bounds. The post estimation tests, which include serial correlation test, heteroscedasticity test, normality test and structural stability CUSUM test, were conducted to examine the adequacy and reliability of the specified model.

3.3 Model Specification

This study extends equation 8 in the theoretical foundation by incorporating other variables to produce the estimated model.

$$GDPG = (CORPT, INQ, GFCF, GEXP, HC, POPG, TOP) \quad (9)$$

$$GDPG = \beta_0 + \beta_1 CORPT + \beta_2 INQ + \beta_3 GFCF + \beta_4 GEXP + \beta_5 HC + \beta_6 POPG + \beta_7 TOP + \mu \quad (10)$$

In growth literature, the effect of corruption on growth is expressed in terms of the time lag for corruption to affect economic performance through relevant channels. This presupposes that corruption precedes economic performance. Thus, equation 10 metamorphoses into equation 11 with lagged explanatory variables.

$$GDPG = \beta_0 + \beta_1 (CORPT)_{t-1} + \beta_2 (INQ)_{t-1} + \beta_3 (GFCF)_{t-1} + \beta_4 (GEXP)_{t-1} + \beta_5 (HC)_{t-1} + \beta_6 (POPG)_{t-1} + \beta_7 (TOP)_{t-1} + \mu \quad (11)$$

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Where GDPG represents a growth rate of GDP, CORPT stands for corruption, GEXP is government expenditure, HC indicates a human capital variable, POPG means population growth rate, TOP implies trade openness, and GDPPC is per capita GDP.

β_0 represents the intercept of the model, $\beta_1 - \beta_7$ are the respective slope coefficients of the model. This shows the partial impact of each independent variable on economic growth μ depicts the error term in the mode; it accounts for omitted variables and measurement errors in the model and variables, respectively.

Apriori expectation: $\beta_1 < 0$; $\beta_2 > 0$; $\beta_3 > 0$; $\beta_4 > 0$; $\beta_5 < 0$; $\beta_6 > 0$; $\beta_7 > 0$

3.4 Data and Description of Variables

Table (2): Description of Variables and Sources of Data

Variable	Description	Measurement (Indicator)	Expected Effect	Source of Data
Economic Performance	Annual growth Gross Domestic Product	GDP growth (annual rate %)	Dependent Variable	The World Bank (WDI, 2020).
Corruption	Corruption perception index	Composite Indicator	Negative	Transparency International (TI) & Central Bank of Nigeria (CBN)
Institutional Quality	The degree to which a country's law protect private property	Contract intensive money	Negative	Central Bank of Nigeria (CBN), 2020).
Investment	Gross capital formation as a percentage of GDP	Capital Formation (% GDP)	Positive	The World Bank (WDI, 2020).
Government Expenditure	Government final consumption expenditure	Government consumption expenditure (%GDP)	Positive	The World Bank (WDI, 2020).
Human capital (Human Development Index)	Human development as a percentage of gross national income	Human development (%GNI)	Negative	The World Bank (WDI, 2020).
Trade Openness	Sum of trade in goods and services measured as a share of GDP	Trade Openness (% GDP)	Positive	The World Bank (WDI, 2020).
Working population growth rate	The percentage growth rate of the Population	Population growth (%)	Positive	The World Bank (WDI, 2020).

Source: Authors' Presentation

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4.0 Data Analysis and Results

This section of the study presents the empirical analysis, results, and discussion of findings. The section also includes descriptive analysis, unit root test analysis, co-integration test using bounds cointegration test, estimation using ARDL, and post estimation tests.

4.1 Descriptive Statistics

This section provides the descriptive or summary statistics of the variables being examined in the study, such as real GDP (*RGDP*), corruption (*CORPT*), institutional quality (*INQ*), gross fixed capital formation (*GFCF*), government expenditure (*GEXP*), human capital (*HC*), working population growth (*WPG*) and trade openness (*TOP*).

Table 3-: Summary Statistics
Sample Period: 1970 – 2020

Variable:	**Statistic:**								
	Obs.	Mean	Max.	Min.	Std. Dev.	Skewness	Kurtosis	JB Stat.	P-value
RGDPG	50	32553.93	72094.1	14306.12	18606.4	1.054	2.574	9.644	0.008
CORPT	50	0.1781	1.6805	-0.0071	0.346	3.048	12.340	259.15	0.000
INQ	50	0.7628	0.9151	0.6214	0.0859	0.380	2.068	3.017	0.221
GFCF	38	0.1593	40.3887	-30.1716	13.587	0.056	3.995	1.587	0.452
GEXP	39	3.7295	9.4483	0.9112	2.838	0.795	2.166	5.241	0.072
HC	39	0.4379	0.539	0.311	0.068	-0.241	1.943	2.192	0.334
WPG	50	2.5973	2.9940	1.8970	0.270	-0.743	2.776	4.699	0.095
TOP	50	33.281	53.278	9.1358	12.030	-0.450	2.279	2.769	0.250

***Source**: Authors' Computation Using Eviews*

Table 3 reports the summary statistics of the variables in the study. Reiterating the measurement units, *RGDP* is expressed in billions of Naira, *GFCF*, *GEXP*, *WPG* and *TOP* are expressed as percentages, while *CORPT*, *INQ*,*COR*,*INQ* and *HC* are given in indices. The mean values or averages recorded for *GDPG*, *CORPT*, and *INQ* are ₦32553.93 billion, 0.178, 0.762 and 0.150 respectively, for the given sample period. Thus, over the period of 50 years, the average index of institutional quality has surpassed that of the corruption. Similarly, the means of *GCFC*, *GEXP*, *HC*, *WPG* and *TOP* obtained for the sample period considered are 0.159%, 3.730%, 0.438,

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2.597% and 33.281% respectively. Apparently, *TOP* appears to have the largest average proportion when expressed percentage of GDP as compared with *GFCF* and *GEXP*.

The maximum *RGDP* of ₦72094.09 billion was recorded in 1970, while the minimum of ₦14306.12 billion was recorded in 1981. The minimum real GDP growth observed suggests the least value worth of economic performance witnessed in Nigeria. The maximum (1.685) and minimum (-0.007) *CORPT* was observed in 2019 and 1970. Apparently, this suggests that Nigeria had witnessed a substantially growing level of corruption during the period under consideration. Similarly, the maximum (0.915) and (0.621) *INQ* were recorded in 2019 and 1970. Seemingly, improvement in institutional quality appears to be concomitant with the rise in level of corruption during the given period under consideration. This implies the Nigerian government did often establish institutional control centres or strengthen existing centre in the event of rising corruption level.

The series R*GDPG*, *CORPT*, *INQ*, *GFCF* and *GEXP* appear to be positively skewed (long right tail) having positive coefficients of skewness (1.054, 3.048, 0.380, 3.249, 0.056 and 0.795 respectively). However, *HC*, *WPG* and *TOP* appear to negatively skewed (long left tail) having a negative coefficient of skewness (-0.241, 0.743 and 0.450 respectively).

Series such as *CORPT*, and *GFCF* appear to have peaked distributions (leptokurtic) having coefficients of kurtosis (12.240, and 3.995 respectively) greater threshold level of 3. Meanwhile, *RGDP*, *INQ*, *GEXP*, *HC*, *WPG* and *TOP* appear to be flat-topped distribution (platykurtic) relative to the normal distribution, having coefficients of kurtosis (2.574, 2.068, 2.166, 1.943, 2.776 and 2.279 respectively) less than the threshold level of 3 in the case of moment distribution. Apparently, corruption (*CORPT*) appears to have the highest peak relative to GDP growth rate and institutional quality for the given sample period.

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The Jarque-Bera statistics for normality test indicate that the series *INQ*, *GFCF*, *GEXP*, *HC*, WPG and *TOP* are normally distributed since their respective p-values (0.2213, 0.4523, 0.0728 0.3342, 0.095 and 0.2504 respectively) are greater than the 5% level of significance. However, *RGDP* and *CORPT* are not normally distributed, having their p-values (0.0081, and 0.0000) are below the 5% level of significance.

4.2. Unit Root Tests

The unit root tests were conducted prior to model estimation to ascertain the stationarity status of the variables in being investigated. Thus, the Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test were employed to evaluate the stationarity of the series.

Table 4 presents the result of the unit test using the aforesaid test methods. As revealed in the table, the results are consistent using both the ADF and PP tests for the variables, except for the W*PG* having conflicting results. Thus, the result of the ADF test was reported because it is a reliable choice of unit root testing [38]. However, series such as *GFCF* and *POPG* appear to be integrated of order zero, that is, they are *I(0)* series. This also implies that they are stationary in their level forms. Meanwhile, other series such as *RGDP*, *CORPT*, *INQ*, *GEXP*, *HC* and *TOP* are integrated of order one, they are *I(1)* processes. This suggests that the series had to be differenced once in order to become stationary. Thus, the combinations of *I(0)* and *I(1)*) orders of integration of the variables validate the use of bounds co-integration test to examine the existence of a linear combination among the variables as proposed by [39].

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Table 4-: Unit Root Test Results
Sample Period: 1970 – 2020

Variable	Test form	ADF-Test Statistics			PP-Test Statistics			*I*(*d*)
		Constant	Constant & Trend	None	Constant	Constant & Trend	None	
GDPG	***Level***	0.6526	-1.3679	2.4482	2.2223	-1.2136	2.9542	***I(1)***
	Δ*GDPG*	-2.2661	-2.4717	-2.6538***	-5.3870***	-5.5115***	-4.6103***	
CORPT	***Level***	1.2591	--0.0449	1.9012	-0.1435	-1.8999	0.3600	***I(1)***
	Δ*CORPT*	-9.1596***	-9.5739***	-8.9267***	-5.6059***	-7.2199***	-5.6380***	
INQ	***Level***	-1.0852	-1.4724	1.3780	-1.2818	-1.9831	1.2742	***I(1)***
	Δ*INQ*	-9.5411***	-9.4265***	-9.2989***	-9.3577***	-9.2541***	-9.0886***	
GFCF	***Level***	--5.1334***	-5.5622***	-5.1900***	-5.7114***	-6.1222***	-5.7930***	***I(0)***
	Δ*GFCF*	-	-	-	-	-	-	
GEXP	***Level***	-1.1130	-2.8549	-0.1761	-1.2948	-1.9936	-0.3328	***I(1)***
	Δ*GEXP*	-5.6976***	-5.6169***	-5.7276***	-5.7444***	-5.6700***	-5.7760***	
HC	***Level***	-1.6670	-2.3488	6.2628	-5.4098***	-1.6255	5.8129	***I(1)***
	Δ*HC*	-5.1874***	-5.2353***	-3.1067***	-5.4465***	-8.6056***	-3.0798***	
POPG	***Level***	-5.1783***	-2.6172	-5.1643***	-2.3785	-2.9270	0..8566	***I(0)***
	Δ*POPG*	-	-	-	-	-	-	
TOP	***Level***	-2.8381	-2.7923	-0.6856	-2.9370**	-2.9094	-0.6161	***I(1)***
	Δ*TOP*	-7.8635***	-7.7898***	-7.9435***	-7.8635***	-7.7898***	-7.9435***	

Source*: Authors' Computation Using Eviews.*
*Note: ***, ** and * denote statistical significance at 1%, 5% and 10% respectively*

4.3 Bounds cointegration Test

The model examines the impacts of corruption (*CORPT*) and institutional quality (*INQ*) on economic performance.

Table 5-: Result Bounds Co-Integration Test
Sample Period: 1970 – 2019

F – Statistic:	10.2960	
Level of significance	**Lower bounds – *I(0)***	**Upper bounds – *I(1)***
1%	3.31	4.63
5%	2.69	3.83
10%	2.38	3.45

Source*: Authors' Computation Using Eviews*

The table 5 presents the results of the bounds co-integration test of the ARDL approach. Thus, since the F-statistic (10.296) exceeds all the critical value bounds at all the 1%, 5% and 10%

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levels of significance for the upper bounds, I(1). This suggests that there is a strong evidence of long run relationship or linear combination among the variables. In other words, real (*RGDP*), corruption (*CORPT*), institutional quality (*INQ*), gross fixed capital formation (*GFCF*), government expenditure (*GEXP*), human capital (*HC*), population growth (*WPG*) and trade openness (*TOP*) appear to have a long-run relationship despite having different orders of integration among the variables.

4.4 Model Estimation (Real GDP Equation)

The study examined the impacts of corruption and institutional quality on economic performance in Nigeria.

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Table 6-: Estimated ARDL Short Run Coefficients
Sample Period: 1970 – 2020
Dependent Variable: *RGDP*

Independent Variable	Coefficient	Std. Error	t-Statistic	*p*-value
C	1.8044	0.1354	13.323	0.0000
Trend	-0.0362	0.0027	-13.265	0.0000
$\Delta RGDP_{t-1}$	0.9001	0.0945	9.5281	0.0001
$\Delta RGDP_{t-2}$	-0.5084	0.0633	-8.0257	0.0002
$\Delta CORPT$	0.0564	0.0078	7.2367	0.0004
$\Delta CORPT_{t-1}$	-0.1079	0.0117	-9.1978	0.0001
ΔINQ	0.3441	0.0740	4.6497	0.0035
ΔINQ_{t-1}	-0.8403	0.0845	-9.9406	0.0001
ΔINQ_{t-2}	-0.6654	0.0731	-9.1051	0.0001
$\Delta GFCF$	0.0009	0.0002	4.0485	0.0067
$\Delta GFCF_{t-1}$	0.0007	0.0002	2.9655	0.0251
$\Delta GFCF_{t-2}$	0.0011	0.0003	4.1563	0.0060
ΔHC	5.4169	0.5992	9.0397	0.0001
ΔHC_{t-1}	-4.0861	0.6398	-6.3861	0.0007
ΔHC_{t-2}	-5.3832	0.5903	-9.1199	0.0001
ΔWPG	0.0886	0.0182	4.8709	0.0028
ΔWPG_{t-1}	0.0763	0.0198	3.8487	0.0085
ΔWPG_{t-2}	0.2711	0.0216	12.537	0.0000
ΔTOP	0.0007	0.0003	2.4483	0.0499
ΔTOP_{t-1}	-0.0019	0.0004	-4.8028	0.0030
ΔTOP_{t-2}	-0.0051	0.0004	-12.3916	0.0000
ECT_{t-1}	-0.4716	0.0353	-13.359	0.0000
R-squared	0.9740			
Adjusted R-squared	0.9317			

***Source**: Authors' Computation Using Eviews*

Table 6 presents the result of the short run form (error correction model) of the ARDL. The coefficient (-0.4716) of the ECT term (error correction term or speed of adjustment coefficient) is negative and statistically significant (p-value = 0.0000) at 1% level of significance. As expected, the ECT coefficient lies between -1 and 0 for convergence. Thus, this suggests that *RGDP* adjusts to *CORPT*, *GFCF*, *GEXP*, *HC*, *WPG* and *TOP* in the long run. In other words, the system corrects its disequilibrium in the previous period at a speed of 47.16%, thereby restoring to equilibrium in the current period. Therefore, equilibrium or long-run relationship has been restored among the variables. In addition, all the short-run coefficients exert statistically significant impacts on economic performance (real *GDP* as the proxy) in the short-run. The

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explanatory power (adjusted R-Squared) of the model is considerably higher (93.17%) and thus, suggests that *CORPT*, *INQ*, *GFCF*, *GEXP*, *HC*, *WPG* and *TOP* are good predictors or determinants economic performance in the short-run.

4.5 Estimation of ARDL Long-Run Coefficients

Table 7-: Estimated ARDL Long-Run Coefficients
Sample Period: 1970 – 2020
Dependent Variable: *RGDP*

Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
CORPT	-0.3322**	0.1219	-2.7258	0.0344
INQ	2.9505***	0.3962	7.4468	0.0003
GFCF	-0.0020	0.0057	-0.3505	0.7379
GEXP	-0.0114	0.0177	-0.6429	0.5441
HC	17.3509**	5.8535	2.9642	0.0251
WPG	0.5557	0.4738	1.1728	0.2853
TOP	0.0162**	0.0054	3.0300	0.0231

***Source**: Authors' Computation Using Eviews*
*Note: *** and ** denote statistical significance at 1% and 5% respectively*

Table 7 reports the result of the estimated long run form of the ARDL for the given sample period. The estimated long-run equation shows corruption (*CORPT*, *p*-value = 0.0344 < 0.05) appears to have negative and statistically significant long-run impacts on *RGDP* (economic performance). Meanwhile, institutional quality (*INQ*), *HC* and *TOP* exert positive and statistically significant impact on *RGDP* exert positively significant long-run impacts on real GDP (*GDPG*). Although *WPG* impacts positively on economic performance (*RGDP*) in the long-run, its impact is not statistically significant. Similarly, *GFCF* and *GEXP* appear to have negative but insignificant impacts on economic real GDP. Emphatically, economic performance responds negatively to the changes in the corruption and positively to institutional quality in the long-run in Nigeria. Thus, a unit rise (fall) in of corruption (*CORPT*) has the potential to lead to a fall (rise) in *RGDP* by about 0.33% while a unit rise (fall) institutional quality (*INQ*) may results

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in *RGDP* by about 2.95% (on average). However, in absolute term, economic performance responds more to institutional quality than corruption.

4.6 Post Estimation tests (Residual Diagnostics)

The post estimation tests include serial correlation test, Heteroscedasticity test, normality test, linearity or specification error test (Ramsey RESET test) and stability test (CUSUM test).

Table 8-: Results of Post Estimation tests
Sample Period: 1970 – 2020

Serial correlation test:		***p*-value**
F-statistic	**1.3907**	0.3479
LM Statistic	**21.3555**	0.1008
Heteroscedasticity test:		***p*-value**
F-statistic	**1.3791**	0.3669
LM Statistic	**30.2937**	0.3493
Normality Test:		***p*-value**
Jarque-Bera	**0.2372**	0.8881
Linearity Test		***p*-value**
t-statistic	1.5505	0.1817
F-statistic	2.4039	0.1817

***Source**: Authors' Computation Using Eviews*

Table 8 presents the results of the serial correlation test, Heteroscedasticity test, normality test and linearity test. For the serial correlation test, since the p-values (0.3479 and 0.1008 respectively) of both the F-statistic (1.3907) and LM statistic (24.3555) are greater than 5% or 10% level of significance, the null hypothesis of no serial correlation cannot be rejected since the test statistics are statistically insignificant. Thus, the model estimated does not suffer from a serial correlation for the considered sample period. The result of the heteroscedasticity test suggests the acceptance of the null hypothesis of homoscedasticity (i.e. absence of heteroscedasticity) since the p-values (0.3669 and 0.3493) of both the F-statistic (1.3791) and LM statistic (30.2937) respectively are greater than 10% level of significance (statistically insignificant). Thus, the model estimated does not suffer from heteroscedasticity for the

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considered sample period. Similarly, the normality test result reveals that the residuals of the estimated model are normally distributed as the p-value (0.8881) of the Jarque-Bera statistic (0.2372) is greater than 10% level of significance (statistically insignificant).

The linearity test using Ramsey RESET test examines whether there is an existence of a linear relationship between the dependent variable (*GDPG*) and the explanatory variables (*CORPT*, *INQ*, *GFCF*, *GEXP*, *HC*, *WPG* and *TOP*) as well as whether the model is correctly specified. The null hypothesis is that the model is linear and correctly. Thus, since the t-statistic (1.5505) and F-statistic (2.4039) are not statistically significant (that is, having their respective p-values above 10% level of significance), the null hypothesis for linearity cannot be rejected. This suggests that the estimated model in this is linear and correctly specified. Meanwhile, the CUSUM test result is presented as figure 1 below:

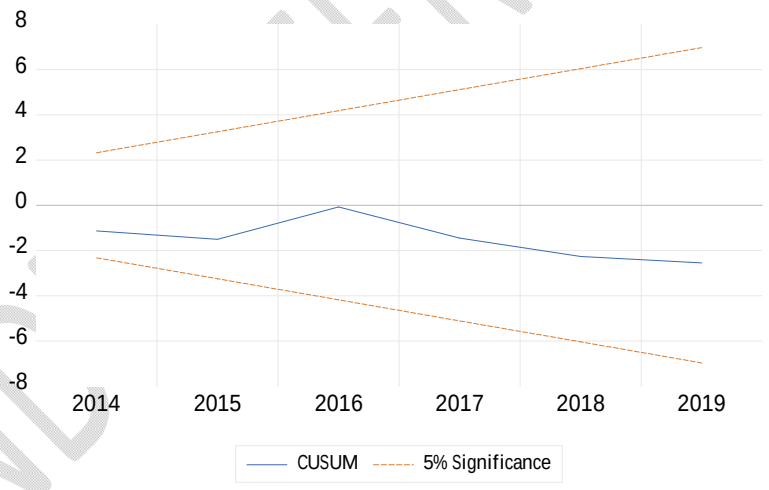

Figure 1-: Plot of Cumulative Sum (CUSUM) of Recursive Residuals

Figure 1 presents the result of the test of stability using CUSUM criterion. Since the plot remains within the critical bounds at 5% level of significant, thus, the model is structurally stable. In other words, the estimated ARDL parameters are stable and appropriate for long run decision making. Therefore, all the post estimation test results suggest that the short-run and long-run

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estimates from the estimated ARDL model are valid and reliable for forecasting and policy making.

5.1 Discussion of Findings

The study examines the impacts of corruption and institutional quality on economic performance, while the second model examines the impact of the interaction of corruption and institutional quality on economic performance (GDP growth as a measure). In the first estimated GDP growth equation for the first and second objectives, corruption was found to negatively significant impact on economic performance in the long-run while institutional quality was found to negative but insignificant impact on economic performance. This finding implies that despite the establishment of institutional centres and laws against corruption to curb corruption, Nigeria still witnesses a decline in economic performance. Therefore, Nigeria seems to have weak institutions and laws to fight corruption. Meanwhile, these findings support the outcomes obtained in the study by [40] on emerging economies. [40] Also found that corruption had a negative effect on the growth of per capita GDP. Also, out of the 41 empirical studies conducted by [41], 32% of the studies revealed that corruption exerts a significant and negative impact on growth, 62% of the studies found that corruption had a statistically insignificant on economic performance, while about 6% of the studies had a contrary outcome that corruption had a positive and significant on economic performance. The finding of this study is consistent with [42], whose findings revealed that corruption had a negative impact on the economic growth in selected OIC countries. The finding of [8] supports the assertion that corruption has a negative and significant impact on economic performance. However, it revealed that institutional quality exerted a significant impact on economic performance, which contradicts the findings of this current study.

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6.1 Conclusion

This study examined the dynamic relationship between twin variables of corruption and institutional quality and economic performance to provide a framework for evidence-based policies designed to puncture the menace of corruption and weak institutional quality in Nigeria. This is essential because the cost of corruption and weak institutional quality is rising among emerging economies where Nigeria belongs, and this has become a topical issue in the social and economic literature in recent years. The data analysis was carried out using the Auto-regressive distributed lag (ARDL), which is appropriate for long-run decision-making and reliable for forecasting and policymaking.

Corruption can be either harmful or beneficial to growth, depending on the quality of the institutional environment. Several studies have found that corruption and weak institutional quality retards economic performance, but most of these findings are based on cross-country analysis, which prompted a country-specific assessment in this present study. Recent attempts to control for the quality of institutions when ascertaining the impact of corruption on economic performance have pointed to a potential nonlinear relationship among them that depends on the quality of the institutions. However, most of the institutional measures previously employed control for the quality of political rather than economic institutions. This study's result established a link between corruption, institutional quality, and economic performance in Nigeria. The existence of this relationship has been and continues to be an antithesis to economic progress in Nigeria. Conclusively, corruption was found to have an adverse and statistically significant long-run impact on economic performance. However, institutional quality exerts a negative but insignificant effect on economic performance. Emphatically, economic performance

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responds negatively to corruption and institutional quality changes on a long-term basis in Nigeria.

Policy Recommendation

The trajectory of Nigeria's economic performance is impeded by high level of corruption and low institutional quality overtime. Therefore, this study revealed that human capital development, trade openness and population growth exerted positive and significant impacts on Nigeria's economic performance. By implication, the Nigerian economy reacts positively to changes in human capital development, trade openness and population growth in the long-run. This suggests that, with the availability of appropriate policies and resources, human capital development, trade openness and population growth have the potential to enhance Nigeria's economic performance in the long-run. Therefore, this study recommends policy interventions aimed at tackling the incidence of corruption, improving institutional qualities and human capital development as well as policies that can stimulate trade expansion which would have ripple positive effects on Nigeria's economic performance.

Direction for Future Research

Future research endeavour can focus on exploring the economic losses attributable to corruption and institutional quality. This present study focused on bureaucratic corruption; it did not analyze political and grand corruption. Political and grand corruption has several complex power relationships, and this type of corruption may have a destructive effect on economic performance. Therefore, assessing the motivations and the environment behind political and grand corruption cases can provide interesting results.

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