

Relationship between Corruption and Inflation in Nigeria

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Abstract: *This study examines the relationship between corruption and inflation in Nigeria for the period 1996 – 2016. Annual time series data on corruption perception index for Nigeria were collected from Transparency International while inflation rate, broad money supply (M_2) and real GDP growth rate were collected from Central Bank of Nigeria Statistical Bulletin for the period. Dummy variable for democracy was also introduced. Autoregressive Distributed Lag (ARDL) approach, using bounds testing procedure to cointegration was adopted to test for the long run relationship between corruption and independent variables. Granger causality test was also conducted to detect the level of causation between corruption and inflation, broad money supply, real GDP growth rate and democracy respectively. The results show that a positive relationship exists between corruption and inflation, corruption and M_2 , implying that an increase in inflation and money supply increase corruption respectively. However, the relationship is not significant. A negative relationship is found between corruption and real GDP growth rate, corruption and democracy. This implies that democracy reduces corruption. It is also found that there is no causality relationship between corruption and inflation in Nigeria for the period. It is therefore recommended that monetary and fiscal policies towards reducing inflation should be pursued to reduce excess liquidity in the economy. Moreover, the on-going democracy in the country and the fight against corruption should be sustained.*

Keywords: Corruption, Inflation, Democracy, ARDL

1. Introduction

1.1 Background of the Study

Corruption has continued to be one of the major social issues affecting the growth and development in Nigeria. Hence, one of the cardinal objectives of the National Economic Empowerment and Development Strategy (NEEDS), which was initiated by the Obasanjo administration, is the fight against corruption. NEEDS (2004) envisions a prosperous Nigeria that is not only developed economically but infused with strong moral and ethical values.

To curb corruption in the country, NEEDS supports the following measures:

- 1) Reform, strengthen and modernize institutions whose duty it is to foster and enforce compliance. These institutions include the independent corrupt practices commission (ICPC) in 2000; the Economic and the Financial Crime Commission (EFCC) in 2003; the National Orientation Agency (NOE); the National Agency for food and Drug Administration (NAFDAC); the police, customs, the judiciary, prisons and immigration.
- 2) Fiscal responsibility Act was also enacted in 2004. The Act requires publication of annual audited accounts by all government agencies and public enterprises within six months of the end of their financial year.

Similarly, the present president of Nigeria, Muhammad Buhari, on assuming office in May, 2015, launched anti-corruption drive in Nigeria. This shows the endemic nature of corruption in Nigeria. Corruption in Nigeria affects public finance, business investment and standard of living. It also burdens the private sector, deters foreign investor, undermines trust in government and diminishes the effectiveness of public policy (Ulman & Bujanca, 2014).

The former president of Nigeria, Obasanjo (2000), notes that corruption has been responsible for the political instability of successive governments in Nigeria since the First Republic. In recent years, Nigeria has been rated as one of the most corrupt countries in the world by the Transparency International (TI). In 2008, Nigeria came 121st out of 150 countries that were assessed, in 2009, she came 130th out of 150 countries and in 2010, she came 134th out of 178 countries that were assessed. Its current ranking in 2017 is 148th out of 180 countries surveyed, a dip from the static ranking of 135th from 2014 to 2016.

Another source of worry is that corruption tends to rise with a rise in inflation (Braun & Di Tella, 2004). This is because inflation can make over-invoicing by procurement officers and under-invoicing by sales personnels easier because it makes auditing more expensive to the principal. Thus, corruption undermines the achievement of government's macroeconomic objective of price stability.

However, empirical works on corruption-inflation nexus are scanty in Nigeria. It is this problem that provokes and motivates this research.

1.2 Objectives of the Study

This research intends to achieve the following objectives:

- 1) To identify the relationship between corruption and inflation in Nigeria; and
- 2) To examine the causality relationship between corruption and inflation in Nigeria.

1.3 Hypotheses of the Study

This research is guided by the following hypotheses.

- 1) H_0 : corruption has no relationship with inflation in Nigeria

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2) H_0 : There is no causality relationship between corruption and inflation in Nigeria.

This research is divided into five sections. Section one is the introductory part, which includes the background of the study, objectives of the study and hypotheses of the study. Section two presents the literature review, which comprises the conceptual literature, theoretical literature and the empirical literature. Section three discusses the methodology adopted for the study. Section four presents and discusses the results, while the last section, section five, focuses on the summary of the findings, conclusion and recommendations.

The study period is 1996-2016. This period covers the time the transparency international started publishing information on CPI for Nigeria and the period the country operated without democracy and the period of stable democracy.

2. Literature Review

2.1 Conceptual Framework

2.2.1 Concept of Corruption

Corruption has been defined in various ways by different scholars. According to Rose-Ackerman (1999), corruption exists when institutions established to regulate the interrelationships between the citizens and the states are used instead for personal enrichment and provision of benefits to the corrupt and undeserving.

World Bank (1997) defines corruption as the abuse of public office for private gains. Public office, in this context, is abused when an official accepts, solicits and extorts a bribe. Similarly, it is also abused when private agents actively offer bribe to circumvent public policies and processes for competitive advantage and profit. From the sociological point of view, public office can be abused for personal benefit (if no bribe occurs), through patronage, nepotism, theft of state assets or diversion of state revenue. This latter definition is broader because it covers all facets of corruption.

The political Bureau of the Federal Republic of Nigeria, in its 1987 report, outlines the corruption characteristics to include: the inflation of government contracts in return for kickbacks; frauds and fabrications of account in the public service, examination malpractices in our educational institutions; taking of bribes and perversion of justice, and the various heinous crimes against the state in the business and industrial sections of the economy. These include collusion with multinational companies such as over-invoicing of goods and foreign exchange swindling, hoarding and smuggling. This definition covers all facets of corruption which have adverse consequences on the economy.

In line with the above definition, El-Rufai (2003) points out that corruption covers a wide range of social misconduct ranging from massive fraud, extortion, embezzlement, bribery, nepotism, influence peddling, bestowing of favour to friends, rigging of elections, abuse of public property, sale of fake or expired drugs, etc.

The Transparency International (TI), founded in 1995, is a non-profit and nongovernmental organization dedicated to curbing corruption in all countries of the world. The TI's corruption perception index (CPI), which is used as a proxy for corruption, categorizes corruption into three parts.

- a) **Grand corruption:** This refers to acts committed at high level of government that distort policies or the central functioning of the state, enabling leaders to benefit at the expenses of the public good.
- b) **Petty corruption:** This refers to everyday abuse of entrusted power by low- and mid-level public officials in their interactions with ordinary citizens... often trying to access basic public goods and services.
- c) **Political corruption:** This refers to manipulation of policies, institutions and rules of procedure in the allocation of resources and financing by political decision makers, who abuse their position to sustain their power, status and wealth.

2.1.2 Concept of Inflation

Inflation refers to a persistent rise in the general price level. Hence, price stability is one of the objectives of momentary policy. Marshal and Swanson (1974, as cited in Cioran, 2014) emphasize that price instability, which manifests as inflation, can have long and intense consequence on a national economy. Fisher (1993) operationally considers price stability to represent an inflation rate between 0 and 3%. High inflation is seen as an agent which leads to the revenue loss of individuals and groups, decay of the income distribution, increase in rent-seeking activities and emergency of ambiguity in an economy (Husted, 1999; Al-Marhubi, 2000 and Haider, Ud Din & Ghani, 2011).

Inflation rate in Nigeria has continued to be on the increase in recent years. From the CBN (2016) Annual report, the rate of inflation in 2011 is 10.8. This increased to 12.2 percent in 2012. Although the rate decreased to 8.5 percent in 2013 and 8.1 in 2014, it increased further to 9.0 percent in 2015 and 15.7 in 2016. If inflation rate rises, real money demand falls, as households protect themselves against the loss in purchasing power. Thus, inflation affects the purchasing power of individuals and groups negatively by lowering the real wage level (Tosun, 2002). This results in corruption because individuals and groups resort to illegal methods to compensate for the loss in their purchasing power.

2.2 Theoretical Framework

In literature, there are three major arguments showing the channels through which corruption impacts on inflation. The first argument is anchored in the theory of optimal taxation. According to this theory, as cited in Ben Ali and Sassi (2016), governments are generally prone to use their supremacy to print money and create inflation as a source of government income. This is referred to as the seigniorage channel. This seigniorage could be more important in country experiencing significant tax evasion. Thus, the higher the corruption, the higher will be the monetary growth and inflation.

The second argument, which links inflation to corruption, holds that corruption could lead to the capital flight, which

reduces the tax base and as a consequence, a decrease in government revenues below what is required. The decrease in revenue and increase in public spending will lead to large public deficits. This creates shortage of liquidities for the government and the easiest solution, which the government often adopts, is to print fiat money. This is more rampant in developing countries with inadequate deep financial markets.

The third argument states that businesses prone to corruption may go underground and rely more on inflation tax.

2.3 Empirical Literature

Studies have been carried out on the relationship between corruption and inflation, focusing on cross country regression particularly in non African countries. Getz and Volkman (2001) examine the interaction between corruption and economic adversity, measured by consumer price index. The result of the analysis shows that inflation is positively related to corruption. They recommend that fighting corruption must necessarily act directly on economic conditions in countries. However, the results of their analyses suffer from endogeneity problem due to reverse causality from corruption to inflation.

In a similar study, Paldam (2002) investigates the cross country pattern of corruption in 100 developed and developing countries in the scope of economic and cultural framework. Corruption perception indexes of the Transparency International for 1999 were regressed on growth, inflation, economic freedom and unfair distribution of income. Employing the method of least squares, the result shows that increase in inflation raises corruption.

In line with Paldam (2002), Tosun (2002) analyses the economic factors resulting in corruption for the period 1982-1995 for 44 countries using panel data techniques. The result reveals that there is a significant positive relationship between inflation and corruption.

Addressing the short-coming of Getz and Volkman (2001), Braun and Di Tella (2004) analyse the interaction between inflation and corruption in 75 countries for the period 1982-1994 through panel data technique. Using corruption index as the dependent variable and change in rate of inflation, import/GDP ratio and index of political right as independent variables and employing least squares method, they find that change in inflation rate causes a positive and statistical significant effect on corruption.

Ata (2009) examines the economic and social factors affecting corruption for the 25 European Union member countries for the period 2004-2007. Using cross-sectional data analysis, the result shows that inflation causes corruption.

Akca, Ata and Karaca (2012) investigate corruption-inflation relationship using panel data techniques from different economic level groups (underdeveloped, developing and developed countries) for the period 2002-2010. The results indicate that inflation has a statistical

significant positive effect on corruption in these three groups of countries investigated.

While the above study shows that the relationship is from inflation to corruption, other empirical works show that the relationship is from corruption to inflation. For example, Al-Marhubi (2000) examines the relationship between corruption and inflation using cross-sectional data for 41 countries for the period 1980-1995. The annual inflation values were used as the dependent variable while corruption indexes were used a proxy for corruption (independent variable). The result indicates a positive relationship between corruption and inflation. However Al-Marhubi (2000) was unable to show any clear empirical evidence that seigniorage channel is causing inflation.

In a similar study, Abed and Davoodi (2000) examine corruption, structural reform and economic performance in a sample of 25 transition economies over the period 1994-1998. They find that high corruption induces high inflation but this link becomes insignificant when the structural reform index is taken into account

In their investigation on the effect of corruption on inflation, Blackburn and Powell (2011) carried out the analysis from a public finance perspective. Employing a dynamic general equilibrium model, the result reveals that corruption causes a loss of revenues needed for the government to finance its expenditures thereby forcing the government to make usage of other sources of revenue, particularly seigniorage than increasing tax. This will induce a rise in inflation.

Omenka (2013) investigates the effect of corruption on development in Nigeria. The study uses descriptive analysis to explore incidences of corruption and its effects on Nigeria's development efforts. It identifies the causes of corruption to include, poverty, pressure from families, communities' ethnic loyalties, among others. The result also shows that corruption leads to the depletion of national wealth.

Ulman and Bujanca (2014), in their work on the influence of corruption on the macroeconomic environment, used countries grouped into three stages of development. Stage I include 38 factor-driven economies (which include Nigeria), stage 2 include 33 efficiency-driven economics while stage 3 include 35 innovation-driven economies. Macroeconomic environment is grouped into five subareas, namely, government budget balance, gross national savings, inflation, general government debt, and country credit rating. The results show that corruption is related with the levels of development of the macroeconomic environment.

Ben Ali and Sassi (2016) investigate the corruption-inflation nexus for a sample of 100 developing countries drawn from five regions (America, Europe, Middle East and North Africa, sub-Sahara Africa and Asia Pacific) over the period 2000-2012. They employ the two step system generalized method of moment (SGMM) estimation. The results indicate a significant positive relationship between all country corruption measures and inflation through seigniorage channel. However, after controlling for money supply (M_2),

the results indicate that corruption is affecting inflation via other channels.

Although, the above empirical works have contributed extensively on the corruption- inflation nexus, there are conflicting results. Empirical works such as Getz and Volkman (2001), Braun and Di Tella (2004), Paldam (2002) and Ata (2009) show causality from inflation to corruption. On the other hands, other empirical studies find reverse causality from corruption to inflation (Al-Marhubi, 2000; Abed & Davoodi, 2000; Blackburn & Powell, 2011, Ben Ali & Sassi, 2016). Again, most of the empirical works reviewed focus on cross country regression outside Nigeria. Empirical works on corruption-inflation nexus are scanty in Nigeria. This study will introduce democracy to identify the influence of this channel on inflation-corruption nexus in Nigeria.

3. Methodology

This research adopts Autoregressive Distributed lag model (ARDL) procedure. The choice of this model is guided by the fact that it is applied irrespective of the order of integration of the variables, I (0) or I (1); it is suitable for small samples; and it does not require pretesting for unit root before the cointegration (Pesaran, Shin & Smith, 2001).

3.1 Description of the Variables/Data

The variables employed in this study include:

- **Corruption (CORRUPT):** This is the dependent variable and it is the proxy for corruption perception index (PCI), published by the Transparency International (TI). CPI ranges between 0 and 10, where 0 means extreme case of a highly corrupt country and 10 means a perfect case of totally corruption free country. However, from 2012 to date, CPI is being scored out of 100.
- **Inflation (INF):** This is independent variable. Inflation rate with the consumer's prices index is used.
- **Broad Money Supply (M₂):** This is also an independent variable. M₂ is one of the channels through which monetary policy is transmitted to corruption. The log of M₂ is used.
- **Real GDP (RGDP):** This is independent variable. Annual growth rate of real GDP (RGDP_r) is used.
- **Democracy (DEMO):** DEMO is dummy variable for democracy which is used as a control variable. Since Nigeria adopted stable democracy in 1999, it is useful to see how democracy channel has helped to control corruption in the country. DEMO is assigned the value of 1 from 1999 to date and 0 for other years before 1999 (showing absence of stable democracy).

CPI was sourced from Transparency International while the independent variables (INF, M₂ and RGDP_r) were collected from Central Bank of Nigeria (CBN) Statistical Bulletin, 2016 edition.

3.2 Model Specification

Based on the empirical literature, the long-run relationship between corruption and inflation is specified below:

$$\text{CORRUPT}_t = \beta_0 + \beta_1 \text{INF}_t + \beta_2 \text{LM}_{2t} + \beta_3 \text{RGDP}_t + \beta_4 \text{DEMO}_t + \mu_t \dots (3.1)$$

Where, CORRUPT, INF, LM₂, RGDP_r and DEMO are as defined above.

β_0 is the constant intercept while $\beta_1 - \beta_4$ are the coefficients of the variables respectively.

μ is the error term and t the time period.

3.3 Economic a Priori Expectations of the Variables.

The coefficient of inflation (β_1) is expected to be positive; an increase in the rate of inflation will bring about an increase in corruption and vice versa. The coefficient of money supply (β_2) is expected to be positive; increase in money supply will lead to an increase in corruption and vice versa. Similarly, the coefficient of RGDP_r is expected to be positive; increase in domestic income affects corruption in the positive direction especially in the developing countries. The coefficient of Democracy (β_4) is expected to be negative; corruption is lower in countries with high political stability and higher in countries with lower political stability.

3.4 Data Analysis Techniques

Although ARDL approach does not require pre-testing for unit root before testing for cointegration, unit root test has to be conducted to ensure that none of the variables is I(2); ARDL cannot be applied when any of the variables is integrated at order two, I(2). Thus, Augmented Dickey – Fuller (ADF) and Philips – Perron (PP) unit root tests were applied to test for unit root before the application of ARDL approach to cointegration.

Following Pesaran et al (2001), the ARDL format of equation (3.1) above becomes:

$$\Delta \text{CORRUPT}_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta \text{CORRUPT}_{t-i} + \sum_{i=1}^p \beta_2 \Delta \text{INF}_{t-i} + \sum_{i=1}^p \beta_3 \Delta \text{LM}_{2t-i} + \sum_{i=1}^p \beta_4 \Delta \text{RGDP}_{t-i} + \sum_{i=1}^p \beta_5 \Delta \text{DEMO}_{t-i} + \lambda_1 \text{CORRUPT}_{t-1} + \lambda_2 \text{INF}_{t-1} + \lambda_3 \text{LM}_{2t-1} + \lambda_4 \text{RGDP}_{t-1} + \lambda_5 \text{DEMO}_{t-1} + \Sigma_t \dots (3.2)$$

Where, t is time period, Δ is first difference operator, β_0 is the constant intercept, $\beta_1 - \beta_5$ with the summation signs represent the short-run dynamics, while $\lambda_1 - \lambda_5$ represent the log-run relationship. Ps are the respective specific optimum lag orders and Σ_t the error term.

When cointegration between the dependent and independent variables is established, the error correction model (ECM), which describes the short-run dynamics or adjustment of cointegrated variables towards their equilibrium values has to be estimated. Thus, the general error correction representation of equation (3.2) is presented as:

$$\Delta \text{CORRUPT}_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta \text{CORRUPT}_{t-i} + \sum_{i=1}^p \beta_2 \Delta \text{INF}_{t-i} + \sum_{i=1}^p \beta_3 \Delta \text{LM}_{2t-i} + \sum_{i=1}^p \beta_4 \Delta \text{RGDP}_{t-i} + \sum_{i=1}^p \beta_5 \Delta \text{DEMO}_{t-i} + \theta \text{ECM}_{t-1} + \Sigma_t \dots (3.3)$$

The lagged residual term (ECM) in equation (3.3) shows the disequilibrium in long run relationship (u_t in equation 3.1).

In estimating equation (3.3), the null hypothesis of no cointegration among the variables is defined by:

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$$

Is tested against the alternative:

$$H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0.$$

Rejecting the null hypothesis means that there is long-run relationship among the variables irrespective whether the variables are I (0) or I (1). This is done by applying a Wald test or F-test. The F-test has two sets of critical values. One set assumes that all variables are of order I (0) and the other set assumes that they are I (1). If the computed F-statistic falls above the upper bound critical values which corresponds to I (1) variables, the null hypothesis of no cointegration is rejected, implying that cointegration exists. Conversely, if the computer F – statistic falls below the lower bound, which corresponds to I (0), the null hypothesis of no cointegration cannot be rejected. If the computed F-statistic falls between the two bounds, the result is inconclusive. The orders of the lags in the specification are selected by the Schwarz- Bayesian criterion (SBC). For annual data, Pesaran and Shin (1999) recommend choosing a maximum of 2 lags.

If cointegration exists, the lagged error correction term (ECM_{t-1}) is created from the fitted values of the lagged long-run values (the λ terms). The coefficient of ECM_{t-1} is expected to be negative and it measures the speed of adjustment to equilibrium after a shock. If there is no cointegration among the variables, the regression has to be performed using the variables at their different orders of integration respectively.

Granger causality test was also conducted to identify the causality relationship between corruption and independent variables.

3.5 Post Estimation Tests.

Robustness residual tests such as Autocorrelation Lagrange Multipliers (LM) test, ARCH heteroscedasticity test and Ramsey Reset for model specification were also conducted.

3.6 Period of the Study

The study period covers 1996 – 2016. Transparency International started publishing data on CPI for Nigeria in 1996.

E – View 9.0 version was the econometric software used to estimate the data.

4. Presentation and Analysis of Results

4.1 Descriptive Statistics

Table 4.1: Below shows the result of descriptive statistics computed for all the series.

Descriptive Statistics					
	Corrupt	INF	LM2	RGDPR	DEMO
Mean	7.716667	12.06571	8.375425	6.204762	0.857143
Median	2.200000	11.54000	8.242206	6.220000	1.000000
Maximum	28.00000	29.27000	14.45216	14.60000	1.000000
Minimum	0.690000	5.380000	5.846005	-1.580000	0.000000
Std. Dev.	10.84004	5.377262	1.928164	3.566489	0.358569
Skewness	1.230233	1.606959	1.304512	0.024088	-2.041241
Kurtosis	2.536894	6.026747	5.696464	3.480473	5.166667
Jarque-Bera	5.484819	17.05416	12.31818	0.204028	18.69097
Probability	0.064415	0.000198	0.002114	0.903017	0.000087
Sum	162.0500	253.3800	175.8839	130.3000	18.00000
Sum Sq. Dev.	2350.128	578.2989	74.35631	254.3969	2.571429
Observations	21	21	21	21	21

Sources: Authors' computation from E-View, Version 9.0

The result of the descriptive statistics above shows that inflation (INF) has the highest mean, followed by broad money supply (M_2), corruption and real GDP growth rate respectively. Democracy has the lowest mean. Corruption has the highest standard deviation while democracy has the least standard deviation. The larger the standard deviation, the larger the variability among the items. Thus, corruption and inflation have the highest variability while democracy has the least variability. All the variables, except democracy, have positive skewness while the values of the kurtosis statistic are different from 3 across the series. The existence of positive and negative skewness and the values of the kurtosis statistic different from 3 across the series is an indication of non-normal distributions. The low probability values of the Jarque – Bera statistic further confirm non-normal distribution.

4.2 Unit Root Tests

Unit root tests were conducted to ensure that none of the series is integrated at order 2, that is, I (2), which is the condition for the application of ARDL procedure. Augmented Dickey – Fuller (ADF) and Philips – Perron (PP) unit root tests were adopted to test for the unit root in the series. The results of both the ADF and PP are presented in Table 4.2 below.

Table 4.2: Results of Unit Root Tests. Augmented Dickey – Fuller (ADF) and Philips – Perron (PP)

Variables	ADF Statistic (with Trend & Intercept) @			PP Statistic (with Trend & Intercept) @			Order integration
	Level	1 st difference	Critical Region	Level	1 st difference	Critical Region	
CORRUPT	-1.695150	-5.031613	1% = -4.532598 5% = -3.673616	-1.695150	-5.282004	1% = 4.532598 5% = 3.673616	I (1)
INF	-5.617556	-	1% = -4.498307 5% = -3.658446	-5.446632	-	1% = 4.498307 5% = 3.658446	I (0)
LM ₂	-4.216757	-	1% = -4.667883 5% = - 3.733200	-6.102232	-	1% = -4.498307 5% = 3.657446	I (0)
RGDPr	-1.993844	- 5.505363	1% = - 4.532598 5% = - 3.673616	-1.806794	-5.542807	1% = -4.532598 5% = -3.673616	I (1)

Source: Authors' Computation from E-Vew, Version 9.0

The results of unit root tests from both ADF and PP tests indicate that the variables are stationary at different orders of integration. Inflation Rates (INF) and Broad Money Supply (M_2) are stationary at levels. In other words, they are I (0) variables, implying that they do not have unit root problem. On the other hand, corruption and growth rate of real GDP are stationary at first difference, that is, I (1). Thus, they are considered to have unit root. The existence of unit root in some of the series necessitates the test for cointegration. This is to identify whether a linear combination of non-stationary variables could yield stationary and indicate properties of long run equilibrium and feedback mechanism.

4.3 Cointegration Test.

Since the above series contain a mixture of I (0) and I (1) variables, ARDL approach is considered appropriate for testing for cointegration between the dependent variable (corruption) and independent variables. The choice of ARDL model is also guided by the small sample size of the study. The result of ARDL, employing the bounds test is resented in Table 4.3 below.

Tables 4.3: Result of Bounds Test
 Bounds test

ARDL Bounds Test		
Date: 08/30/18 Time: 13:27		
Sample: 1997 2016		
Included observations: 20		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	0.693575	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Sources: Authors' Computation from E-view, Version 9.0

The result of the bound test shows that the value of F-statistic is 0.693575. This value is below the value of the lower bound, which in I(0) at 5 percent level of significance. This implies that there is no cointegration between the dependent variable (corruption) and independent variables (inflation, broad money supply, real GDP and democracy).

Since there is no cointegration between the dependent and independent variables, it is not necessary to conduct Error Correction Mechanism (ECM) to test for the short run dynamics of the series. Hence, regression has to be performed using the variables at their different orders of integration. The empirical result of OLS is presented below.

Table 4.4 Result of OLS

Dependent Variable: D(CORRUPT)				
Method: Least Squares				
Date: 08/30/18 Time: 13:43				
Sample (adjusted): 1997 2016				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.539756	8.151463	-0.311571	0.7597
INF	0.122707	0.405327	0.302737	0.7662

LM2	0.317139	0.852016	0.372222	0.7149
D(RGDPR)	-0.091593	0.393363	-0.232845	0.8190
DEMO	-0.213122	5.296141	-0.040241	0.9684
R-squared	0.024068	Mean dependent var		1.365500
Adjusted R-squared	-0.236181	S.D. dependent var		5.540486
S.E. of regression	6.160116	Akaike info criterion		6.686386
Sum squared resid	569.2054	Schwarz criterion		6.935319
Log likelihood	-61.86386	Hannan-Quinn criter.		6.734981
F-statistic	0.092479	Durbin-Watson stat		2.361861
Prob(F-statistic)	0.983369			

Sources: Authors' Computation from E-view, Version 9.0

4.4 Evaluation of the Results/Congruence with Empirical Studies

The result of OLS presented in Table 4.4 above shows that inflation is correctly signed (positive); an increase in inflation by 1 percent increases corruption by 12.27 percent. This result is in line with the findings of Getz and Volkman (2001), Braun and Di Tella (2004), Paldam (2002), Tosun (2002), Acka, Ata and Karaca (2012), Ben Ali and Sassi (2016).

Broad money supply (M_2) is correctly-signed (positive). Increase in money supply by 1 percent increases corruption by 31.71 percent; this finding is in line with Ben Ali and Sassi (2016) who note that the higher the corruption, the higher the monetary growth because of the seigniorage channel.

The coefficient of real GDP growth rate is wrongly – signed (negative). An increase in real GDP by 1 percent decreases corruption by 9.0 percent. This is in line with Omenka (2013), who finds that corruption leads to the depletion of national wealth.

The coefficient of democracy conforms to expectation, that is, negative. The result indicates that 1 per cent increase in democracy lowers corruption by 21.3 per cent. However, the effect of democracy on corruption is not significant.

The result shows that corruption picks up at – 254 per cent when other variables are held constant (or equated to zero).

The above result on the relationship between corruption and inflation shows that inflation has positive but insignificant effect on corruption. Therefore, the null hypothesis is not rejected.

4.5 Granger Causality Test

Table 4.5: Below shows the result of Granger causality test

Pairwise Granger Causality Tests			
Date: 08/30/18 Time: 13:41			
Sample: 1996 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause CORRUPT	19	0.00066	0.9993
CORRUPT does not Granger Cause INF		0.41274	0.6696
LM2 does not Granger Cause CORRUPT	19	1.63385	0.2303
CORRUPT does not Granger Cause LM2		3.04478	0.0798
RGDPR does not Granger Cause CORRUPT	19	0.93413	0.4161

CORRUPT does not Granger Cause RGDP	0.65489	0.5347
DEMO does not Granger Cause CORRUPT	19	0.15829
CORRUPT does not Granger Cause DEMO	0.00705	0.9930

Source: Authors' computation from E-View, Version 9.0

The result of Granger causality test shows that there is no causality relationship between corruption and inflation in Nigeria during the period covered.

Thus, the null hypothesis is not rejected. This findings contradicts the findings of Getz and Volkman (2001), Paldam (2002) and Ata (2009), who found causality from inflation to corruption; others found reverse causality from corruption to inflation (Al-Marhubi, 2000; Abed & Davoodi, 2000; Ben Ali & Sassi, 2016).

4.6 Robustness Tests

The diagnostic tests conducted for the robustness of the model include Lagrange Multiplier (LM) for serial correlation, ARCH heteroscedasticity test and Ramsey Reset test for model specification.

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.187507	Prob. F(2,12)	0.8314
Obs*R-squared	0.606083	Prob. Chi-Square(2)	0.7386
ARCH Heteroscedasticity Test			
F-statistic	0.016386	Prob. F(1,17)	0.8996
Obs*R-squared	0.606083	Prob. Chi-Square d ²	0.8924

Ramsey Reset Test			
t-statistic	0.84449	Prob. F(13)	0.4356
F-statistic	0.647139	Prob. (1.13)	0.4356

Sources: Authors' Computation from E-view, Version 9.0.

The probability values of the various diagnostic tests above are greater than 0.05 respectively. This implies that there is no serial correlation, heteroscedasticity problem and the functional form of the model appears well specified.

5. Conclusion/ Recommendations

This study examines the relationship between corruption and inflation in Nigeria for the period 1996 – 2016. Annual time series data on corruption perception index, which was collected from the Transparency International (TI) were used to measure corruption. Data for the independent variables (Inflation rate, broad money supply (M₂), and growth rate of real GDP) were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin, 2016 edition. A dummy variable for democracy was also introduced to assess how democracy has helped to reduce corruption in Nigeria. ARDL approach, employing bounds test to cointegration was adopted to establish the long run relationship between corruption and independent variables. Granger causality test was also conducted to identify the level of causation between corruption and each of the independent variables.

The empirical results show that there is no long run relationship between corruption and independent variables (Inflation rate, broad money supply, economic growth and

democracy) in Nigeria during the period of the study. It is also found that increase in inflation increases corruption. However, the effect of inflation on corruption is insignificant.

The results also show that increase in broad money supply increases corruption. On the contrary, increases in real GDP growth rate decreases corruption. Democracy is found to have a negative effect on corruption, which implies that democracy reduces corruption. However, the effect of democracy towards reducing corruption is not significant. The result of Granger causality test shows that there is no causality relationship between corruption and inflation in Nigeria during the study period.

Based on the findings, the following recommendations are made. Increase in inflation and broad money supply increases corruption. Excess liquidity in the economy increases inflation and inflation in turn reduces real wage. Reduction in real wage reduces the purchasing power of money. This leads to income loss of individuals and groups. Thus, the individuals and groups adopt different methods, such as bribery, lobbying and rent seeking activities. Therefore, the government should implement living wages for the people that reflect the inflationary trend and at the same time adopts contraction monetary and fiscal policies to reduce inflation in the country. The study indentifies that democracy lowers corruption; however, its effect on corruption is insignificant. It is recommended that the present government should sustain the on-going democracy in the country and empowers the anti-graft agencies to continue in their fight against corruption in the country, especially in high places.

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