

# The Effect of Corruption and Pipeline Vandalization on Nigeria's Per Capita Income

<sup>1</sup> Okezie, Amachukwu Chibuzo  
Chartered Institute of Bankers Consultant, Lagos

<sup>2</sup> Marcus, Samuel Nnamdi  
Department of Economics, Achievers University, Owo

## Abstract

There is no consensus on the macroeconomic consequences of corruption, neither is there, on the parts of the world more prone to it. To some corruption greases the economy while to others corruption sands the economy. This study, therefore, investigates the effect of corruption on per capita income of Nigeria. It also studies the impact of crude oil pipeline vandalisation (which is a brand of corruption), on the per capita income of Nigeria. The period of study spanned 1995 to 2015, covering different government regimes, in the country. The Vector error correction and long run Johansen co-integrating equation approach, useful for estimating both short-term and long-term effects of one time series on another are used in the analysis. Findings revealed that both corruption and pipeline vandalization have an inverse relationship as well as a significant effect on per capita income in the long run. Pipeline vandalization however, showed an inverse relationship in the first period of the short run. The short run dynamics revealed that the economy will return to equilibrium at rate of 30 percent. The study recommends the building of truly independent institutions to curb corruption, the stigmatization of corrupt persons and their families, strong economic policies to check pipeline vandalization.

**Key words:** *Corruption, Pipeline vandalization, Per capita income.*

## Introduction

Corruption is a hydra-headed monster. Most people have an idea of what it is, but may not necessarily share the same idea or view about it. Some authors believe corruption is a disease common with the poor or developing countries. For instance, Nauro, Ralitz and Ahmad (2010) argue that corruption is common with poor countries while Gupta, Davoodi and Alonso (2002) opine that it is now widely accepted that corruption is not restricted to specific regions or levels of economic development. Corruption is a global phenomenon. It is not the exclusive preserve of any nation, race or section of the world but transcends national boundaries and frontiers and symbolizes phenomenal universal unwholesomeness politically (Aluko, 2009).

Corruption is the bane to socio-economic development in Nigeria. However, it has truly become people's choice of priority to work or carry out their duties for personal gains to the detriment of our dearly growing economy. Bad management and misappropriation of public funds as part of corruption has long contributed largely to this menace of decadence, thereby ensuring that people's needs are not met. As a result, people are now dying of hunger. Not only that, there is no good road network, of which people cannot have access to the few food crops made available by the peasant farmers in the rural areas. And the poor health facilities as can be witnessed in the public hospitals, whereby people die in numbers daily out of ordinary ailments. Unemployment is increasing even as the country continues yearly to produce a chunk of graduates without deeming it necessary for job creation to meet up with the graduates. In short, infrastructure development in the country is at zero level. And all these things mentioned and more are still the consequences of corruption to Nigeria (Igbaekemen, Abbah, and Geidam, 2014).

To this end an understanding of the issues that boarders around corruption are pertinent. For instance, giving money to hasten the processing of an application, awarding contracts and appointments to those who gave large campaign contributions, shunting a queue, bribing a doctor to ensure your father gets the medicine he needs, using government construction equipment to build one's house, diverting fund for purposes for which it is not meant for because the action will be in one's favour, shielding corrupt persons, employing unqualified candidates into positions

Corruption is not just cases linked to government officials skimming off money for their own benefit. It includes cases where the systems don't work well, and ordinary people are left behind. They all involve the misuse of public office for private gain. In other words, they involve a government official benefiting at the expense of the taxpayer or at the expense of the average person who comes into contact with the government. By contrast, private corruption is between individuals in the private sector, such as the Mafia extorting money from a local business. This study is on both public and private corruption.

One interesting debate in the literature is on the macroeconomic consequences of corruption and whether it greases or sands the wheels of economic growth and development. For example, Leff (1964) and Huntington (1968) (as cited in Nauro e tal 2010) argued in favour of the greasing hypothesis, positing that corruption enhances trade that would not have happened otherwise and promotes efficiency by allowing private sector agents to circumvent cumbersome regulations. Leff, (2007) (in Nauro e tal 2010) support this view, showing that in highly restrictive regulatory environments, corruption can enhance economic growth by stimulating entrepreneurship and efficiency.

Those opposing this view argue that the greasing effect of corruption is only possible as a second best option in a malfunctioning institutional setting. Theoretical analyses and empirical evidence supporting this view abound, showing that corruption sands the wheels of growth. Rock and Bonnett (2004) argue that corruption reduces investment in most developing countries (such as Nigeria), and particularly in small open economies.

The inconclusiveness of the evidence on the relationship between corruption and growth necessitate this study. In Nigeria for example, Rotimi and Obasaju (2013) showed that there is a positive relationship between corruption and economic growth. This study did not include any other variable in the model. Also, Akinpelu, Ogunseye, Bada and Agbeyangi (2013) revealed that as the economy grows, corruption increases but the study did not show the effect of corruption on economic growth. This study will include pipeline vandalization as leakage in the economy. The objective of this study therefore is to examine the effect of corruption and pipeline vandalization on the per capita income of Nigeria. The study is in five sections. Literature review is presented in section two after introduction in section one. The model for the study is specified in section three; results are presented and analyzed in section four while conclusion and policy recommendations are done in the fifth section.

## **2.0 Literature Review**

### **2.1 Conceptual Literature**

Just as there are varieties of corrupt behavior, so there are many factors contributing to corruption. So many explanations are offered that it is difficult to classify them in any systematic manner (Caiden 2001). Corruption is an act involving dishonesty, illegality and non- conformity with accepted standard of behaviour. And such an act or behaviour has as its main aim, the return for financial or material benefit, either for the person committing the act or on behalf of any other person (Igbaekemen, Abbah, and Geidam, 2014). This study argues that an act of corruption may also be for non-material benefit but could also be for sycophancy. According to Longman Active Dictionary (New Edition) (as cited in Igbaekemen, Abbah, and Geidam, (2014), corruption is a dishonest or immoral behaviour by politicians or people who work for government. This definition is narrow in the sense that it limited corruption to only politician and public servants.

According to Transparency International (2010), corruption is the abuse of entrusted power for private gain. Corruption is a value concept which broadly defined, means immorality, moral debasement and depravity. Ogundele and Opeifa (2004), describe corruption as consisting of several elements including deceit, trickery, cheating, intentional deception, dishonesty and the conscious premeditated action of a person or group of persons to alter the facts of a matter or transaction for the purpose of selfish personal gains. By extension we posit that corruption takes advantage of situations to make personal gain which involves illegitimate material and non-material advantages. Hence, a corrupt act is immoral, illegal and unapproved. According to Bardhan's (1997) corruption is the practice whereby a government official demands bribes from a foreign business in return for the right to operate in a country, industry or location.

In my opinion this last sentence is not necessary

Onuoha, (nd) defines Oil pipeline sabotage, as the illegal or unauthorised act of destroying or puncturing of oil pipelines so as to disrupt supply or to siphon crude oil or its refined products for purposes of appropriating it for personal use or for sale on the black market or any other outlet. It includes such acts as oil bunkering, pipeline vandalisation/fuel scooping and oil terrorism. In this sense, any person(s) or company involved in such an act is considered to be guilty of economic sabotage.

Gross domestic product is the sum of the value of all the products and service produced in a country during a fiscal year. It is one of the indicators of production and growth rate of the economy and plays a strategic role in development, employment and the balance of payment (Volker, 2005). Mc connell and Brue (2005) explains GDP as the total market value of all final goods and services produced annually within the boundaries of an economy whether by the citizens or foreign supplied resources. The primary measure of an economy's performance is its annual total output of goods and services, that is, aggregate output. It comprises all goods and produced either by the citizens- supplied or foreign-supplied resources used within the country.

Gross National Income (GNI) per capita on the other hand, is gross national income divided by midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad, World Bank (2012)

## 2.2 Theoretical Literature

Barro and Martins (2004) show that the relationship between capital and output in the endogenous growth theory can be shown as  $Y = AK$ . Where, Capital K is defined more broadly than in the neoclassical model. It is composite of manufactured and knowledge-based capital while A is a positive constant showing the level of technological growth. New ideas in the form of technology are major determinants of long-run growth which in turn is determined by planned investment in research and development. But, Romer's production function includes technological advancement as a production agent alongside capital and labor. The point to note here is that technological knowledge is regarded as a form of capital which accumulates via research and development and similar knowledge creating process. Although investment propensities cannot be the whole story, it makes sense as a starting point to try to relate the growth rate of an economy as its willingness to save and invest.

We posit here that corruption and pipeline vandalization as a leakage will impede savings and investment in the economy. Hence, capital accumulation, human capital development and technical progress become difficult.

## 2.3 Empirical literature

Campos, Ralitzia and Ahmad (2010) reviewed a total of 460 estimates from 41 different studies. Of the estimates reviewed, 32% indicate a significant and negative impact of corruption on growth, 62% suggest a statistically insignificant relationship, while approximately 6% provide support for a positive and significant relation. In a study of corruption and global capital flows to emerging countries, Wei and Shleifer (2000), found that corruption affects both the volume and the composition of capital inflows into emerging markets negatively because, it reduces inward FDI substantially. They found that FDI is more susceptible and vulnerable to corruption than foreign portfolio investment and other forms of capital inflows. Ugur and Dasgupta (2011) carried out a systematic review of 115 studies comprising 39 studies of theoretical/analytical nature and 84 empirical investigations with particular focus on low income countries and other countries. Findings reveal that the total impact of corruption on per capita GDP growth in low income countries is -0.59, i.e one-unit increase in the perceived corruption index is associated with a 0.59 percentage point decrease in the growth rate of per capita income. The study further states that most of this impact operates through negative effects of corruption of the public sector, including the levels and composition of both taxes and expenditure and government effectiveness in general. Including all countries, the corresponding overall impact of corruption on the per capita GDP growth rate is a decrease of 0.91 percentage point. Shleifer and Visny (1993) found that corruption reduces the incentives for businesses to invest. In a study of corruption and growth, Mauro (1995), found that corruption had a significant negative impact on a country's economic growth rate.

Mo (2001), using cross section analysis, this study estimates the overall effect of corruption on the growth rate of GDP. It also decomposes this overall effect into the contributions of various transmission channels, including political instability, human capital formation, and fixed investment. A one unit increase in corruption (measured on a 0 to 10 scale) reduces the average annual growth rate of GDP by 0.55 percentage points. The most important channel through which corruption affects economic growth is political instability, which accounts for 52 % of the overall decline in the growth rate. Negative effects on human capital formation and private investment contribute 15 and 21 percent to the overall reduction in growth respectively. The above paragraph is not clear, particularly, the first 2 sentences

Pellegrini and Gerlagh (2004), using cross section analysis, estimates the direct and indirect effects of corruption on economic growth. The indirect transmission channels analyzed include fixed investment, trade policy, schooling, and political stability. The overall effect of corruption on per capita output growth is a 0.38 percentage point reduction in the average annual growth rate. The contributions of the transmission mechanisms

identified are: fixed investment (32%), openness (28%), political (in) stability (16%), and schooling (5%). Akinpelu, Ogunseye, Bada and Agbeyangi (2013). Investigated the socio-economic determinants of Corruption in Nigeria employing Co-integration test and vector error correction model were used to analyze the time series data. Their finding shows that there is a long-run relationship between corruption and the social - economic variables in Nigeria. Aidt et al. (2008) tested the hypothesis that the relationship between corruption and growth depends on the institutional environment characterizing the economy, i.e. that it is "regime dependent". They use a threshold model to estimate the impact of corruption on growth, using cross section data for 75 countries. The effect of corruption is "regime dependent": it has a large and statistically significant negative effect on per capita GDP growth in countries with high quality public sector governance regimes. In countries with low quality governance regimes the effect of corruption on growth is not statistically significant. Ata and Arvas (2011) examined the determinants of economic corruption across 25 countries of Europe.

The empirical findings of this paper suggest that economic development, inflation, economic freedom and income distribution are found statistically significant determinants of corruption. In this respect, in periods of economic boom, as GDP per capita rises, corruption declines. On the contrary in periods of high inflation and skew income distribution, corruption rises. However, in this study, economic growth is found to be a statistically insignificant determinant of corruption.

### 3.0 Materials and Method

#### 3.1 Method of Analysis

This study employs the distributed lag mechanism to investigate the effect of corruption on Nigeria's economy. The method is appropriate as it probes into the previous periods and reveal both the contemporaneous and cumulative effect of the variables in the model.

#### 3.2 Theoretical Framework

To obtain the effect of corruption on per capita income of Nigeria, the study adopts the endogenous growth model. The study adopts the growth model on the basis that per capita income is a function of economic activity of both residents and foreigners in an economy as well as net income from abroad. Hence, an increase or decrease in economic activity affects income. The Romer model for instance states the growth model as follows;

$$Y = A(R) F(R_i, K_i, L_i) \dots \dots \dots 1$$

Where

Y= aggregate out put

A= technological progress resulting from knowledge from research and development

$R_i$ = the stock of result from expenditure on research and development

$K_i$ = capital stock

$L_i$ = labour staock

Romer's model can be rewritten as

$$Y = f(A, K, L) \dots \dots \dots 2$$

Equation (2) suggests that economic growth is a function of technological progress, capital stock and labor stock.

Growth accountants such as Solow postulate that A is total factor productivity. He state that A is the residual when labour and capital inputs are subtracted from growth or output. Total Factor Productivity is often seen as the real driver of growth within an economy and studies reveal that whilst labour and investment are important contributors, it may account for up to 60% of growth within economies (Easterly, 2001).

The correlation between TFP and economic growth is such that variation in A which represents other factors of production will affect output produced. Our assumption here is that other than labour and capital economic growth is affected by numerous other variables like corruption and oil pipeline vandalization.

Growth accounting theorist like Lipsy asserts that labour and capital accounts for only 40 % of growth while other factor not included in the growth model represented by the term A known as total factor productivity accounts for about 60 % of growth. Based on this assertion we therefore assume that factors like corruption, pipeline vandalization which is factored in in as part of TFP can also affect growth.

#### 3.3 Model Specification

From the foregoing we specify that;

$$PCI = f(A) \dots \dots \dots 3$$

Where

PCI= economic growth

A= corruption, pipeline vandalization,

The functional model of this study is therefore derived from equation (3) as follows;

$$PCI = f(\text{corruption, pipeline vandalization})$$

The linear and empirical model is presented below

$$\ln PCI_t = \delta_0 + \delta_1 \ln Plv_t + \delta_2 Crp_t + u_t \dots \dots \dots 4$$

where *PCI* is per capita income, *Plv* is pipeline vandalization, *Crp* is corruption index, and  $\delta$  are the coefficients of the variables to be estimated,  $u_t$  is the stochastic error term.

Considering a dynamic VEC model of two lags equation (4) becomes;

$$\Delta \ln PCI_t = \delta_0 + \Delta \delta_1 \ln PCI_{t-1} + \delta_2 \Delta \ln PCI_{t-2} + \delta_3 \Delta \ln Plv_{t-1} + \delta_4 \Delta \ln Plv_{t-2} + \delta_5 \Delta \ln Crp_{t-1} + \delta_6 \Delta \ln Crp_{t-2} + u_t \dots \dots \dots 5$$

A priori Expectation  $\delta_1, \delta_2 > 0; \delta_3, \delta_4, \delta_5, \delta_6 < 0$

### 3.4 Types and Sources of Data

Data for this study is secondary and sourced from various sources. The gross national per capita data was gotten from the World Bank national accounts data, and OECD National Accounts data files. The corruption index is from the official website of transparency international. Pipeline vandalization data was adopted from the work of Okoli and Arinya 2013.

## 4.0 Presentation and Analysis of Result

**Table 1 Lag Selection Criteria**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6.114	NA	0.000627	1.139	1.284	1.147
1	51.227	86.012*	1.546	-4.903	-4.324*	-4.873729
2	62.137	12.274	1.426*	-5.142*	-4.128	-5.090*

Authors regression output

Table 1 above shows that the Akaike information criterion is most appropriate for the study being the lowest of all the competing criteria, hence the study estimates a two lag model.

**Table 2 Augmented Dickey Fuller Unit root Results**

Variables	Levels	First diff	Critical va.	Remarks
Pci	-0.402	-4.672382	-3.030	I(1)
Crp	-4.272	-	-3.065585	I(0)
Plv	-4.038	-	-3.066	I(0)

Author regression output

The unit root result above show that all variables are stationary at level except for per capita income which is stationary at first difference.

**Table 3 VEC Residual Serial Correlation Test**

Lags	LM-Stat	Prob.
1	3.913	0.917
2	2.631	0.977
3	12.437	0.190

Author regression output

The serial correlation result in table 3 reveals the acceptance of the null hypothesis of no serial correlation at lag three.

**Table 4 Unrestricted Johansen Cointegration Rank Test (Trace) and Max. Eigen value**

Hypothesized No. of CE(s)	Trace Stat.	Critical val.	Max-Eigen Statistic	Critical val.
None*	88.994	29.797	67.069	21.132*
At most 1*	21.925	15.495	12.782	14.265
At most 2*	9.1435	3.8415	9.1435	3.841*

Author regression output  
 \*co-integrating equations

The Johansen co-integration in table above indicates that there are three and one co-integrating equations using the trace and Maximum Eigen statistics respectively. This result is the reason for the choice of the VECM for this study.

**Table 5 The long run Johansen co-integrating Equation with Per capita as dependent variable**

Variable	Coefficient	Std. Error
LNCRP	-0.584	0.164
LNPLV	-0.321	0.030

Author regression output

Table 5 is the long run Johansen co-integrating result. It shows the long run relationship that exist between per capita income and pipeline vandalization and corruption. Increased corruption and vandalization of oil pipelines decreased per capita income and are significant in explaining changes in per capita income..

**Table 6 The short run Dynamics with Per Capita income as Dependent variable**

Variable	Coeff.	Std. Error	t-Statistic
DPCI(-1)	-0.332	0.238	-1.395
DPCI(-2)	-0.075	0.285	-0.263
DCRP(-1)	0.538	0.194	2.775
DCRP(-2)	0.032	0.047	0.664
DPLV (-1)	-0.068	0.032	-2.124
DPLV(-2)	0.0125	0.033	0.375
C	0.015	0.027	0.551
ECM	-0.298	0.115	-2.581
R <sup>2</sup>	0.560		

Author regression output

In the short run, only increased pipeline vandalization decreases per capita income in the first period. Increased perceived corruption index increased per capita income in both period. All variables are insignificant in explaining systemic change in per capita income. The error correction model correctly signed and significant. The model explained 56 per cent variations in per capita income while the remaining is attributed to variables not included in the model.

#### 4.1 Discussion of Result

The long run co-integrating estimate shows that the coefficients of corruption and pipeline vandalization confirms with the a’ priori expectation. This suggests that increased corruption and pipeline vandalization in the economy decreased per capita income. This results supports the study of Rock and Bonnett (2004) and at variant with the study of Rotimi and Obasaju (2013). The result of this study mirrors the Nigerian situation. Corruption and pipeline vandalization have hampered investment hence a low per capita income. The direct and insignificant relationship between per capita income and the explanatory variables in the short run could be due



to lag effects. Many economic shocks do not affect the economy immediately but in future, as such corrupt practices and vandalization of pipelines does not affect per capita income in the short run.

## 5.0 Conclusion and Policy Issues

The main focus of this study is to investigate the effect of corruption and pipeline vandalization on Nigeria's per capita income. Employing the vector error correction mechanism is appropriate because given the pretest results and its ability to endogenize all the variables. From the findings, corruption does not affect per capita income significantly in the short run, and also has a direct relationship.

The study concludes that corruption and pipeline vandalization inversely and significantly affects the per capita income in the long run while they directly and insignificantly affect it in the short run. This result is at variance with the work of Rotimi et al (2013). The position of this study is that corruption has not impacted the economy positively. The reason for this position is due to the fact that monies looted are not invested into productive activities rather deposited in foreign accounts; hence do not instigate domestic economic activity, but that of foreign country. Pipeline vandalization also has not increased economic activity rather has reduced income.

The study recommends that corruption be fought by an institution independent of government while government makes public offices less attractive. Corrupt persons and their families should be stigmatized and be denied of some political and socioeconomic privileges. Further corruption should be made to be a course of study at all levels of education in Nigeria. To curb pipeline vandalization the need for Socio-economic policies to address the urge to vandalize is pertinent. These may include job creation and the control of negative externalities caused by explorations.

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