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Growth Without Development: Role of Corruption in Nigeria's Economic Malaise

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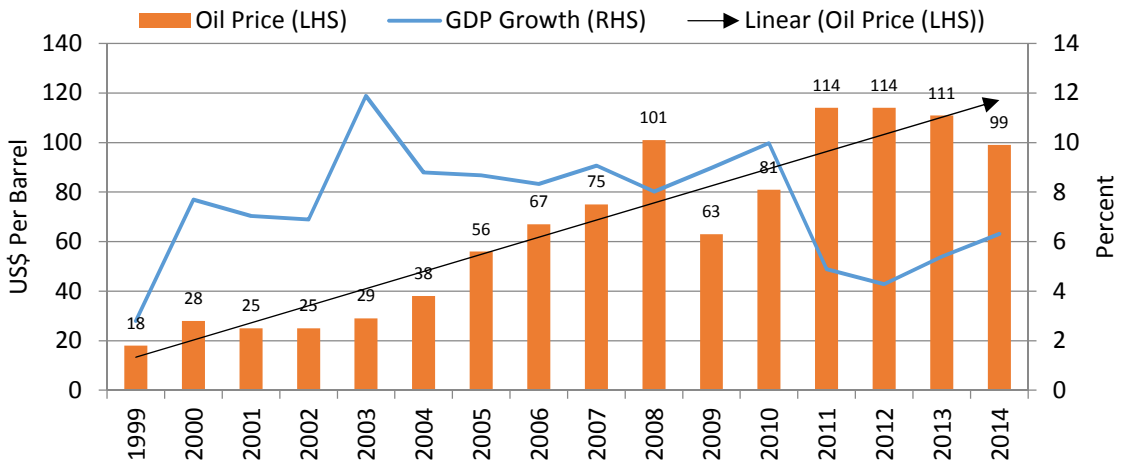
Abstract
Nigeria has for long made headline news as one of the most corrupt countries in the world. The country is well endowed with oil resources and is the largest nation on the African continent in terms of population and gross domestic product (GDP), and yet it lags other comparator countries by most development indicators. The paper aims to explore the nature, causes, magnitude and consequence of corruption, especially now that the new Nigerian government has identified the fight against corruption as its top policy priority. We employed a new statistical technique, based on a factor analytic approach to structural equation modelling, to estimate the magnitude of corruption and its impact on economic development. This study marks a complete departure from previous studies which solely relied on corruption perception indices, which do not necessarily reflect the extent of corruption in Nigeria. The findings based on the new dataset on corruption suggest that corruption, as a percentage of GDP, has risen from a mere 9 percent of GDP in 1960 to nearly 80% by 2013. Furthermore, results from the econometric analysis of the impact of corruption show that corruption does not only retard economic growth and development but it also undermines the efficiency of both domestic investment and foreign direct investment (FDI). The paper concludes by making a few policy recommendations for curbing corruption in Nigeria.
Keywords: Nigeria, Corruption, Hidden Economy, Economic Growth & Development, Structural Equation Modelling

1. Introduction

Nigeria is a land of paradox. The country is richly endowed with natural resources and it is the largest economy in Africa in terms of Gross Domestic Product (GDP) and population. Until recently, the country has benefited from massive oil windfall associated with rising oil prices over the past two decades or so. In fact, crude oil prices rose from a mere $18 per barrel in 1999 to a record level of $114 per barrel in 2011 and 2012 (Figure 1). Since June 2014, however, crude oil prices had declined by over 60%, with serious implications for fiscal policy. The decades of rising oil prices had prompted the Nigerian government to introduce a fiscal rule based on the price of oil, leading to the creation of a stabilisation fund (Excess Crude Account, ECA) for excess revenue from crude oil sales. The proceeds from the ECA were initially meant to finance key physical and social infrastructure projects but were later shared between the three tiers of government (federal, state, and local governments). In addition, the economy has witnessed robust growth, averaging 7.6% per annum during the period 1999-2014 (Figure 1), and yet the growth has not trickled-down nor inclusive enough to address the challenges of poverty, unemployment and the infrastructure deficit.

In spite of the oil wealth and the robust growth performances, the Nigerian economy is still a laggard in terms of most indicators of development. Nearly 70% of the population are currently living below the international poverty line of $1.25 per day (Table 1); around 60% of youth are unemployed (NBS 2015); social and physical infrastructures are inadequate and dysfunctional; and an unprecedented surge in crimes, insecurity and conflicts is breeding instability and uncertainty.



Source: IMF, WEO Database; World Bank, WDI Database; NNPC, Annual Statistical Bulletins

Table 1: Nigeria's GDP Growth Rate and Crude Oil Prices

Table 1: Selected Poverty Indices			
	1995	2003	2010
Income share held by second 20%	9.12	10.41	9.62
Income share held by third 20%	13.55	15.43	14.45
Income share held by fourth 20%	20.22	22.46	21.61
Income share held by highest 20%	52.11	46.07	48.93
Income share held by highest 10%	37.10	29.88	32.87
Income share held by lowest 10%	1.89	2.19	2.17
Income share held by lowest 20%	5.00	5.63	5.39
Poverty headcount ratio at $2 a day (PPP) (% of population)	86.53	83.33	82.20
Poverty headcount ratio at $1.25 a day (PPP) (% of population)	68.65	61.84	62.03
Poverty gap at $2 a day (PPP) (%)	49.84	44.67	44.79
Poverty gap at $1.25 a day (PPP) (%)	32.16	26.89	27.46
GINI index (World Bank estimate)	46.50	40.00	42.95
Source: World Bank, World Development Indicators Online Database			

All this sad state of affairs has largely been blamed on natural resource curse, which has introduced opportunities for rent-seeking activities. Widespread corruption, avarice, greed, cronyism and nepotism have all been at the heart of Nigeria's economic malaise, as public finances have been badly managed and squandered by a few at the expense of the many. Corruption has undoubtedly undermined the country, helping to keep the majority of Nigerians poor and perpetuating instability, especially the long-running conflict with the Boko Haram terrorist group.

It is therefore not surprising that the new Nigerian government of President Muhammadu Buhari has identified the fight against corruption as one of its cardinal policy priorities. Since coming power on 29 May 2015 on a pledge to root out corruption that has long permeated Nigeria, President Buhari has squeezed the flow of public funds in an effort to clean up the Nigerian economy. He has put many public projects on hold to review the contracts, and ordered many government ministries, departments and agencies (MDAs) to consolidate their bank accounts for closer monitoring of financial transactions through the implementation of the Treasury Single

Account (TSA). He has overhauled the management of the state oil company (Nigerian National Petroleum Corporation, NNPC), while also moving quickly to retrieve stolen money.

The government, in collaboration with the international community, is vigorously pursuing alleged treasury looters and plugging leakages through the TSA and prevention of crude oil theft and vandalism. The head of the anti-corruption body, i.e. the Economic and Financial Crime Commission (EFCC), has removed and replaced by one of his relatively upright lieutenants. Recently, the anti-corruption campaign has escalated with the arrest, in the UK, of Nigeria's former oil minister, whose five-year tenure was marred by recurring accusations of widespread theft. She, along with five other accomplices, was held as part of inquiries into corruption and money laundering (New York Times, 19 October 2015).

Whether or not the current government will succeed in curbing corruption in Nigeria is another issue, but the key questions are: Why is corruption so pervasive in Nigeria? What are the determinants of corruption in Nigeria? What is the impact of corruption on economic growth and development in Nigeria? How could corruption be curbed in Nigeria? These and other related questions will be addressed in this paper.

The paper will employ a Structural Equation Model (SEM) methodology to estimate the magnitude of corruption in Nigeria and its impact on economic development. Section 2 of the paper reviews the literature on corruption in general and the causes of corruption in Nigeria in particular. Section 3 discusses the SEM technique and applies it to estimate the size of corruption and the underground economy in Nigeria. Section 4 analyses the impact of corruption on economic development. Section 5 pulls together the main conclusions of the paper and policy recommendations.

2. Literature Review

Corruption takes numerous connotations. The narrowest definition of corruption is that it is the misapplication of public resources to private ends. In a broader sense, however, corruption can be defined as "an arrangement that involves an exchange between two parties (the demander and the supplier) which (i) has an influence on the allocation of resources either immediately or in the future; and (ii) involves the use or abuse of public or collective responsibility for private ends" (Macrae, 1982, p.678). By misallocating resources, corruption can significantly retard social and economic development. There is, however, an alternative view that certain kinds of corruption can act as a lubricant that oils the wheel of commerce or government. Even so, corruption is a subset of a wider concept of the 'hidden' or 'underground' economy, including rent-seeking and directly unproductive activities (Salisu 2003).

Corruption is a global phenomenon but its nature, magnitude and consequences differ vastly across nations. The literature on the causes and impacts of corruption is copious. Earlier studies included those by Colins (1965), Macrae (1982, Brownsberger (1983), Aigner et al. (1988), Tanzi (1994), Schleifer and Vishny (1993), Mauro (1995), and Rose-Ackerman (1999). More recently, however, notable research in this field included World Bank (2004), Dreher et al. (2007) and Pieroni et al. (2013). For instance, the World Bank (2004) had put the estimates of bribery at more than US$1 trillion per annum, and concluded that tackling corruption, improving governance and the rule of law could raise the per capita income of a country by up to 400 per cent.

In the context of Nigeria, however, a substantial number of econometric studies on corruption and its impact on economic growth in Nigeria have emerged recently (see, for example, Salisu, 2003, 2005; Segun, 2012; Mathew et al., 2013; Ibraheem et al., 2013; Erhieyovwe and Onokero, 2013; Odi, 2014; Sunkanmi and Isola, 2014). However, with the exception of Salisu (2003; 2005), all of these studies have relied on corruption perception indices in their econometric modelling, either as an explanatory variable when investigating the impact of corruption or as a dependent variable when exploring the determinants of corruption. Unfortunately, these perception-based indices, produced annually by the Berlin-based Transparency International, are based on foreign investors' perception about a host country's business environment, and may not necessarily reflect the true extent of corruption in the host country. In fact, studies from other parts of the world have reported a low correlation between actual corruption and perceived corruption (Mocan, 2004; Dreher et al., 2007). Similarly, a comparison of perception-based indices with direct surveys across six Sub-Saharan African countries revealed a gap between the perception-based measures and reality (Razafindrakoto and Roubaud, 2006). It is therefore likely that policy recommendations from studies based on corruption perception indices can be misleading.

2.1 Causes of Corruption in Nigeria

Indeed, Nigeria has for long made headline news as one of the world's most corrupt nations, and the corruption perception-based indices have contributed to highlighting the pervasiveness of corruption in the country. Since its inception in mid-1990s, the Transparency International has consistently ranked Nigeria in the corruption league table as one of the most corrupt countries in the world (Table 2). Well, few would dispute Nigeria's premier position in the corruption league table, as corruption has permeated every stratum of society, especially so in the corridors of power in recent history. As the cliché goes, "keeping an average Nigerian from being corrupt is like keeping a goat from eating cassava" (Salisu, 2003).

Table 2: Nigeria's Ranking in the Corruption Perception Index (CPI)

Year	Rank/ No. of countries	CPI Score	Year	Rank/ No. of countries	CPI Score
1995	N.A.	N.A.	2005	152nd /158	19
1996	54th/54	7	2006	142nd /163	22
1997	52nd/52	18	2007	147th /179	22
1998	81st/85	19	2008	121st /180	27
1999	98th /99	16	2009	130th /180	25
2000	90th /90	12	2010	134th /178	24
2001	90th /91	10	2011	143rd /182	24
2002	101st /102	16	2012	139th /174	26
2003	132nd /133	14	2013	144th /177	25
2004	144th /145	16	2014	136th /175	27

Source: Transparency International Website: www.transparencyinternational.org.
Note: The Corruption Perceptions Index scores countries on a scale from 0 (highly corrupt) to 100 (very clean).

Indeed, the pervasiveness of corruption and economic mismanagement poses a serious threat to policy making and implementation processes in Nigeria. The Nigerian economy would have been in a much better shape but for corruption, unproductive rent-seeking, mismanagement and theft of public resources by the trustees of those same resources. So, the key question is what are the main causes of corruption in Nigeria?

There are several causes of corruption in Nigeria, which can be classified into three broad categories: policy-induced corruption, natural resource endowments, and cultural/socio-political factors (Salisu, 2003).

Policy-induced sources of corruption stem from pervasive and non-transparent regulations which allow officials to have an excessive degree of discretion in applying them. For instance, people may be willing to pay bribes to government officials in order to obtain pure rents that the regulations may generate. Some of the government-induced sources of corruption, identified in the rent-seeking literature, include: trade restrictions (e.g. quotas on imports); government subsidies; multiple exchange rate practices and foreign exchange allocation (e.g. licensing); and wage differential between public and private sectors (Tanzi, 1994).

Endowments of natural resources, such as crude oil, constitute a major source of economic rents since they can be sold at a price that far exceeds their cost of extraction. Sachs and Warner (1995) have argued that resource-rich economies are more likely to be subject to extreme rent-seeking behaviour than are resource-poor economies. In Nigeria, for example, oil wealth has undoubtedly been one of the main causes of the pervasiveness of rent-seeking activities and corruption. The oil boom of the 1970s was largely responsible for sowing the seeds of the so-called 'Dutch Disease' syndrome in Nigeria which led to the contraction of agricultural output, appreciation of the real exchange rate and a loss of competitiveness of agricultural exports. Since then, Nigeria's agricultural and manufacturing sectors have never recovered their lost glory. Although the discovery of oil is a gift for which Nigeria should be thankful, the misuse of the oil revenues to finance large-scale public expenditure programmes introduced 'grand' (political) corruption in the country.

Societal and cultural factors constitute yet another potential source of corruption. In Nigeria, traditional values of gift-giving and tributes to leaders often lead to what Brownsberger (1983) describes as "polite corruption". Although not every gift-giving may constitute corruption, the ethics of dependency relations, family pressures on government officials, ethnic loyalties and attitudinal tendencies (e.g. greed or love for ostentation) may play a vital role in explaining some of the corrupt practices of public servants in Nigeria. In fact, the *Financial Times*

(1993) has argued that Nigerians see nothing wrong with using public funds to disperse favours to a cousin or to build a well for one's village, as it is an informal means of redistributing wealth. Such an act is considered as a lubricant or a positive sum game of "give-and-take" which is widely practised in job offers, award of contracts, import licences and even in obtaining admission to institutions of higher education. In essence, the visible riches of the corrupt and the greedy spur the poor to imitate their life styles and modes of wealth acquisition.

Thus poverty, political instability and other societal forces tend to put pressure on public servants to be corrupt. This is especially so when politicians and public servants know that their opportunities may vanish following a defeat at polls or their kinsmen place expanded demands on them or they feel compelled to maintain a high visible standard of living. In some cases, people who are known to have corruptly enriched themselves are regularly courted and honoured by communities, religious bodies, and other private sector organisations. This implies that people who benefit from the largesse of these corrupt people rarely ask questions. These sociological and cultural causes of corruption are likely to continue for a long time in Nigeria, unless credible legal enforcement measures are put in place because the forces which deter corruption are often weak and some of the law enforcement agencies are themselves corrupt.

3. Structural Equation Modelling of Corruption

As stated earlier, the use of corruption perception indices in econometric regressions may provide misleading policy conclusions. It is therefore important to utilise other methodological approaches to measure the magnitude of corruption. One such approach is based on techniques for estimation of the size of the hidden or underground economy. Bhattacharyya and Ghose (1998) have argued that disaggregated hidden economy estimates can provide helpful information in identifying the growth of corruption.

A number of techniques have been employed to estimate the size of the hidden economy. One such technique is the 'factor analytic' approach, based on the statistical theory of latent (unobserved) variables. A variant of this approach is the Multiple Indicators and Multiple Independent Causes (MIMIC) technique, which is a special case of linear interdependent structural relationship model of Zellner (1970), Joreskog and Van Thillo (1973), and Joreskog and Goldberger (1975). The MIMIC framework is a structural equation model for estimating an equation in which the dependent variable is unobservable (latent). Frey and Weck-Hannemann (1984) pioneered the use of MIMIC modelling in the context of the hidden economy. Since then, a number of other studies have employed this technique (Aigner *et al*. 1988; Schneider 1997; Giles 1999; Salisu, 2003; Dreher et al., 2007; Pieroni et al., 2013).

The MIMIC model is a powerful technique for estimating corruption because the unknown coefficients of the model are estimated separately through a set of structural equations with the indicator variables being used to capture the effect of the latent variables indirectly, in our case only one latent variable, i.e. corruption. This type of model yields only a time-series index for the latent variable, namely the size of corruption relative to GDP. Additional extraneous information is needed to calibrate the index to construct a cardinal time-path of corruption (Giles, 1999). Most previous studies calibrated the hidden economy via linking it with a currency demand equation (see, for example, Bhattacharyya, 1990; Giles 1999). This approach will be adopted in this paper.

The MIMIC model is characterised by a latent endogenous variable (corruption) with no measurement error in the independent variables, and can be formally specified as:

$$y = \lambda\eta + \varepsilon \quad (1)$$

$$\eta = \gamma' x + \zeta \quad (2)$$

where:
y = a column vector of indicators of the latent or unobservable variable, η.
x = a column vector of 'causes' or determinants of the latent or unobservable variable, η.
ε and ζ are vectors of errors, and are assumed to be mutually uncorrelated.

Equation (1) constitutes the measurement model for the latent variable η while equation (2) is the structural equation for the latent variable, η. Since corruption is a latent or unobservable phenomenon, the factor analytic equations (1) and (2) can provide a good methodological framework for estimating it. Figure 2 shows the diagrammatical interrelationships between corruption (η), its determinants (x) and its indicators (y).

The theoretical literature has identified four broad sets of determinants of the hidden economy: (i) burden imposed by the public sector on individuals (TB), (ii) tax morality (TM), (iii) labour market conditions (L), and (iv) structural factors (SF). In this context, and for purposes of estimating the unobservable variable (η), equation (2) can be re-written as:

$$\eta = \gamma 1TB + \gamma 2TM + \gamma 3L + \gamma 4SF + \zeta \quad (2a)$$

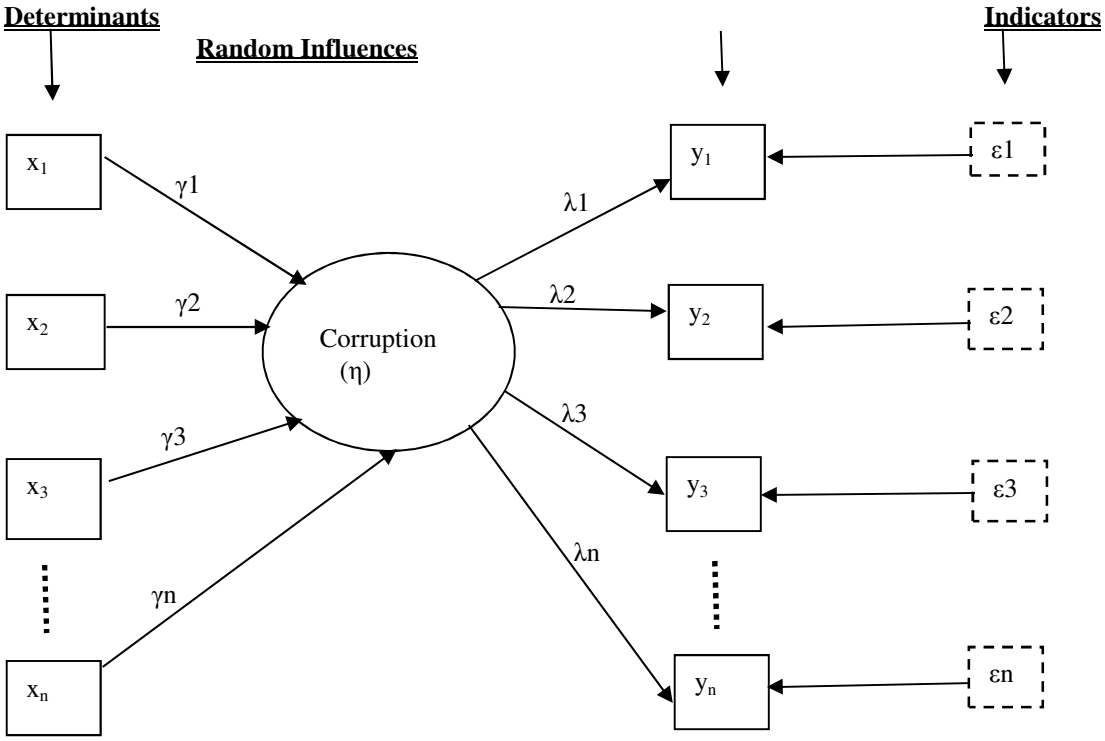


Figure 2: Structural Equation Model's Path Diagram for Corruption

The burden on the official economy may consist of burden of taxation (measured by either the average or marginal tax rate) and the burden of regulation (measured by the number of regulators or the ratio of the number of public sector employees to total employment). The *a priori* expectation on the coefficient of the tax "burden" is negative, implying that an increase in the burden will drive people into the hidden economy. Tax morality, however, reflects the readiness with which individuals leave the official economy. A decline in tax morality will reduce people's trust in government and will consequently increase their willingness to go underground. Frey and Weck-Hannemann (1984) have suggested that the consequences of tax morality can be checked by a growing intensity of public controls and a rise in expected punishment, which will reduce the return on hidden activities.

In the case of the labour market, it is hypothesised that the incentive to work in the hidden economy is high for the unemployed, since they can work in the underground economy while at the same time receiving unemployment benefits where such benefits exist. It is noteworthy, however, that while the demand for underground activity rises with unemployment, it is also likely that the supply of job opportunities in the hidden economy will fall with rising unemployment. Overall, the effect of unemployment on the shadow economy is ambiguous, depending upon the elasticities of demand and supply with respect to the rate of unemployment.

The level of economic development can also influence the hidden economy. Individuals with low per capita real disposable income will have a strong incentive to hold multiple jobs and to pay taxes only on the first job (Frey and Weck-Hanneman 1984). Empirical evidence from Italy, however, suggests that the size of underground economy in the rich North is larger than in the poor South. This positive relationship between per capita income and hidden economic activity suggests that the supply of hidden economy jobs may increase with an increase in

per capita income. The expected sign of the coefficient of the level of development, however, is a priori ambiguous.

The theoretical literature on the hidden economy suggests three sets of indicators: (i) the growth rate of the real GDP, (ii) labour market participation rate, and (iii) monetary variables. These constitute the elements in the y vector in equation (1) above. An increase in the hidden economy implies that inputs (particularly labour) move out of the official economy, with a negative effect on the growth of the observed GDP. In the case of monetary aggregates, the literature hypothesises a positive relationship between activity in the hidden economy and cash-to-demand-deposits ratio, as the bulk of transactions are conducted in cash.

We used the MIMIC approach to estimate the magnitude of corruption in Nigeria based on the four sets of determinants and three indicators of the hidden economy. The causal factors are: tax burden (measured by the share of taxes in GDP), unemployment rate, inflation rate and real per capita income. The three indicators used in the MIMIC analysis are changes in male participation rate, real growth rate of GDP, and changes in cash-to-demand-deposits ratio.

Table 3 shows the estimates of the hidden economy for the years 1961-2013. The size of the hidden economy shows a rapidly increasing trend; it increased substantially throughout the seventies and declined in 1984-85 before rising again. The declining trend in mid-1980s probably reflects the then General Muhammadu Buhari's policy measures to curb corruption and indiscipline. Tagged 'War Against Indiscipline' (WAI), the short-lived era of the Buhari-led administration had succeeded in reducing widespread corruption in both public and private sectors of the Nigerian economy. But with the ascendancy of General Babangida to power through a palace coup in mid-1985, he quickly abolished the WAI decree. Since then, corruption in Nigeria has increased dramatically, despite the introduction of a number of anti-corruption agencies such as the Economic and Financial Crime Commission (EFCC), Independent Corrupt Practices and related Commission (ICPC), and the Code of Conduct Bureau (CCB).

Table 3: Estimates of Corruption in Nigeria, 1960-2013

Year	% of GDP	Year	% of GDP	Year	% of GDP	Year	% of GDP	Year	% of GDP
1960	9.64	1971	15.78	1982	36.57	1993	54.65	2004	71.54
1961	10.02	1972	18.54	1983	45.76	1994	58.65	2005	72.74
1962	10.42	1973	18.55	1984	31.08	1995	65.43	2006	74.30
1963	10.72	1974	22.45	1985	35.50	1996	64.65	2007	75.86
1964	11.20	1975	26.43	1986	36.65	1997	58.76	2008	76.67
1965	11.54	1976	26.80	1987	37.65	1998	62.40	2009	77.22
1966	11.54	1977	27.85	1988	39.76	1999	64.84	2010	78.23
1967	12.10	1978	28.94	1989	42.34	2000	67.38	2011	78.43
1968	12.36	1979	30.08	1990	40.54	2001	70.02	2012	79.12
1969	12.66	1980	32.54	1991	42.43	2002	71.12	2013	80.11
1970	12.83	1981	34.65	1992	43.54	2003	72.00		

Source: Estimated with LISREL statistical software using the MIMIC methodology.

4. Impact of Corruption on the Nigerian Economy

To evaluate the effects of corruption on the Nigerian economy, we utilised the estimated levels of corruption derived from the MIMIC technique in an economic growth equation framework. The procedure follows a conventional growth model in which corruption is introduced as an input, in addition to the traditional factors of production such as labour and capital. We divided capital into domestic capital (DK) and foreign capital (FK) in order to capture their relative contributions to economic growth. The general form of the production function can be written as:

$$Y = f(L, DK, FK, CR, Z) \quad (3)$$

where:

Y = Gross domestic product (GDP) in real terms

L = Labour input
DK = Domestic capital stock
FK = Stock of foreign capital
CR = Corruption
Z = a vector of other variables affecting output, including technical progress

Foreign capital in the form of foreign direct investment (FDI) is regarded as the prime source of human capital and new technology to many developing countries, so its inclusion in the production function is expected to capture the externalities, learning by watching and spill-over effects associated with FDI (Balasubramanyam, Salisu & Sapsford, 1999).
Assuming equation (3) to be linear in logs, taking logs and differencing we obtained the following expression describing the determinants of the growth rate of GDP.

$$y = \alpha + \beta l + \gamma dk + \psi fk + \varphi cr + \sum_{i=5}^{k} \lambda_i z_i + \varepsilon \quad (4)$$

where lower case letters denote the rate of growth of individual explanatory variables and the parameters β, γ, ψ, φ and λ_i are output elasticities of labour, domestic capital, foreign capital, corruption and a vector of other variables respectively. Alternatively, these parameters can be interpreted as the partial derivatives of the growth rate of GDP with respect to the growth rate of the respective individual explanatory variables.

The elasticities of output with respect to labour, capital domestic and foreign capital are expected to be positive while that with respect to corruption is expected to be negative. Due to the formidable problems associated with measuring the stock of capital, especially in less developed countries such as Nigeria, we approximated the growth rate of domestic and foreign capital stocks by the share of domestic investment (gross fixed capital formation) and FDI in GDP respectively, in line with previous studies (Balasubramanyam, Salisu and Sapsford, 1999). Accordingly, replacing the rates of change in domestic and foreign capital inputs by the share of domestic and foreign direct investment in GDP, respectively, yields the following growth equation:

$$y = \alpha + \beta l + \gamma(I/Y) + \psi(F/Y) + \varphi(CR/Y) + \sum_{i=5}^{k} \lambda_i z_i + \varepsilon \quad (5)$$

Where: I/Y is domestic investment-to-GDP ratio, F/Y is FDI-to-GDP ratio and CR/Y is corruption-to-GDP ratio.

The signs of the parameters of labour, domestic investment and FDI are expected to be positive on the grounds that these three variables could promote economic growth and development, while the sign of the coefficient of corruption is expected to be negative, since corruption could largely undermine economic growth and development. Similarly, a corruption-riddled economy is likely to deter FDI as well as erode the efficiency of both domestic and foreign investments. In other words, in the presence of pervasive corruption, the growth enhancing effects of FDI and domestic investment could be constrained. As a result, equation (5) can be modified to include interaction terms between corruption and FDI and domestic investment, as follows:

$$y = \alpha + \beta l + \gamma(I/Y) + \psi(F/Y) + \varphi(CR/Y) + \theta(F/Y)(CR/Y) + \pi(I/Y)(CR/Y) + \sum_{i=5}^{k} \lambda_i z_i + \varepsilon \quad (6)$$

The expected signs of the coefficients of the interaction terms, θ and π, (the coefficients of the interaction term between corruption and FDI and the interaction term between corruption and domestic investment) are ambiguous, depending on whether or not the positive impact of FDI (domestic investment) on growth outweighs the negative impact of corruption. In a country where corruption is pervasive, coefficients of both interaction terms are expected to be negative, whereas in economies where corruption is milder, the coefficients should be

positive suggesting that either the beneficial effects of investment outweigh the efficiency-eroding prowess of corruption or that some level of corruption is needed to grease the wheels of commerce!

The model, represented by equation (6), is estimated using annual data over the period 1965 to 2013 when complete sets of data were available. Table 4 shows the estimated parameters for the four sets of equations. In equations (a) and (b) in the table, the dependent variable is the growth rate of real per capita GDP, using official GDP figures while in equations (c) and (d), the dependent variable is the growth rate of real per capita GDP, using both official GDP and the estimated GDP derived from the hidden economy. In each case, the difference between the two equations is the inclusion of an oil dummy variable to reflect the exceptionally high oil price episodes.

All equations were estimated with the ordinary least squares (OLS) method. The overall fitness of the statistical relationship in all equations is good as demonstrated by the high R^2. In addition, none of the equations suffers from the econometric problems of serial correlation, incorrect functional form and residual non-normality of errors as the calculated chi-squared values for these three test statistics are well below their tabulated chi-squared values corresponding to the appropriate degrees of freedom.

As is widely expected, in the first two equations where the dependent variable is the growth rate of the official GDP per capita, the estimated coefficient on corruption is negative and statistically significant at the 10 per cent level or lower. However, in the two equations where the dependent variable is the growth rate of the combined per capita GDP of both the official and the hidden economies, the estimated coefficient of the corruption variable is positive but not statistically significant. This is not surprising because the dependent variable in equations (b) and (c) includes the growth rate of the hidden economy which should correlate positively with corruption.

In the case of domestic investment and FDI, their estimated coefficients are positive and statistically significant at the 1% level, signifying the important contributions they play in the economic development process. The results also strongly suggest that FDI plays a more important contribution to economic growth than domestic investment. Similarly, the estimated coefficient on the interaction term between corruption and domestic investment and the estimated coefficient between the interaction term between corruption and FDI are negative and statistically significant at the 1% level in equations (a) and (b) but not in equations (c) and (d). This result suggests that corruption erodes the efficiency of both domestic and foreign direct investments. With regards to domestic investment, especially public investment, the result appears to lend support to the widely held view that capital-intensive projects constitute breeding grounds for corruption in Nigeria. In other words, the efficiency of public investment is severely curtailed by corruption. This finding concurs with conclusions of a number of empirical studies elsewhere (e.g. Shleifer and Vishny 1993; Mauro 1997; Tanzi and Davoodi 1997; Ades and Di Tella 1997) that corruption adversely affects the productivity of public investment and distorts the effects of industrial policy on investment.

Table 4: Estimated Growth Equations for Nigeria (1965-2013)

	Dependent Variable: GDP per capita growth rate			
	Official Economy		Official & 'Hidden' Economies	
	(a)	(b)	(c)	(d)
INTERCEPT	1.735***	1.494***	2.59***	2.317***
LF	0.381***	0.316***	0212	0.216
I/Y	0.062***	0.069***	0.577***	0.583***
F/Y	0.134***	0.138***	0.867****	0.881***
CR	-0.024***	-0.023***	0.021	0.021
(F/Y)*(CR/Y)	-0.006***	-0.006***	0.010***	0.010***
(I/Y)*(CR/Y)	-0.176***	-0.168***	0.004	-0.005
OILDUM	0.231*	---	0.125*	---
R^2	0.854	0.866	0.978	0.978
LM-SC	3.23	2.56	2.91	2.78
LM-FF	2.43	2.35	1.97	1.84
LM-NM	0.65	0.61	1.58	1.71

Notes: Figures in parenthesis denote absolute values of t-statistics; *, **, *** denote significance at the 10%, 5% and 1% levels, respectively; LM-SC, LM-FF and LM-NM denote Lagrange multiplier test statistics for residual serial correlation, functional form, and normality respectively. On the relevant null hypothesis the test statistics for residual serial correlation and functional form are distributed as χ^2 with 1 degree of freedom. In the case of residual normality, it is distributed with χ^2 with 2 degrees of freedom. At the 5% significance level, the critical $\chi^2_1 = 3.84$ and $\chi^2_2 = 5.99$.

OILDUM is a dummy variable for high oil price episodes taking the value of 1 for the periods 1973-1980, 1990-1992, 2003-2008, 2012-2013, and 0 for all other periods.

With regards to the negative coefficient of the interaction term between corruption and FDI, the result implies that the interplay between FDI and corruption may result in a positive private rate of return even though the social rate of return may be negative! The implications of the results of the growth equation are that in as much as corruption adversely affects the growth promoting efficacy of investment, it would undermine economic development by not unleashing its full potential for job creation, poverty alleviation and income growth.

5. Conclusions and Policy Recommendations

This paper has explored the nature, causes and impact of corruption in Nigeria using a new set of data on corruption based on structural equation modelling. Previous studies on corruption in Nigeria have relied solely on corruption perception indices which may not necessarily reflect the true extent of corruption in the country because such indices do not take into account the causes and indicators of corruption and the associated underground activities. By explicitly taking into account the independent causes and indicators of corruption, the indices produced by the structural equal model were calibrated using a monetary demand equation to determine the proximate magnitude of corruption. Using the new set of corruption data in the real per capita GDP growth equation provides strong evidence that corruption not only retards economic development in Nigeria, but it also reduces the efficiency of investment in the economic growth process. This calls for a well-orchestrated effort to nip corruption in the bud, and thus placing the fight against corruption on top of the policy priority agenda of the new Buhari-led government is a right step in the right, and must be pursued with vigour.

However, combating corruption requires a multidimensional approach that addresses the many causes, facets and

structural issues that corruption entails. According to the World Bank, this also requires courage and a long-term commitment by a variety of anti-corruption actors, including political leaders, public servants, civil society, media, academics, the private sector organisations and international governmental and non-governmental agencies.

Indeed, Nigeria has a number of anti-corruption policies but the problem is lack of implementation of those policies. What is now needed is the political will to implement the anti-corruption laws and regulations in a comprehensive and methodical manner. That is why the current stance taken by President Buhari on zero tolerance on corruption is commendable. Even so, providing leadership by example alone may not curb corruption unless the government has put in place an effective monitoring and surveillance mechanism to ensure that all stakeholders play by the same rule book. For instance, the president and his deputy have publicly declared their assets with the Nigerian Code of Conduct Bureau, but there is a lot of inertia from high-profile public servants and politicians to do the same. Similarly, there is the need for proper civil service reforms to address the culture of bureaucratic elitism and to inculcate into them the change mantra of the new government, while at the same conducting attitudinal reforms to change societal perception of corruption, including dramatic changes in attitudes toward political processes, and mobilising political will for change. Without mobilisation of civil society, government officials are unlikely to follow through on anti-corruption reforms once they enter politically complex terrain!

Other anti-corruption measures that the government should pursue include strengthening internal and external control systems, and introducing stiffer statutory penalties on corrupt persons, making dismissal from the civil service both a painful and credible threat. The proceeds of corruption must also be fully recovered from corrupt public servants.

On the fiscal front, the government should introduce financial disclosure, open budget process and zero-budgeting framework as well as ensuring that all budget proposals by all ministries, departments and agencies (MDAs) are in line with the country's overall medium term expenditure framework.

Finally, the government must scale down pervasive regulations which contribute to the demand and supply of corrupt activities, through unnecessary lobbying, rent-seeking and directly unproductive activities. In addition, public procurement processes must be streamlined with little or no room for personal discretion.

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