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Corruption Effects on Nigeria: Aggregate and Sectoral Estimates Using VAR

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| ARTICLE INFO	ABSTRACT
	This research study investigates the impact of corruption on some key activity sectors of the Nigerian economy between 1996 and 2013 using VAR technique. The empirical estimates demonstrate that corruption affects most significantly agriculture, services, wholesale and retail sectors in Nigeria. As well, the study shows that the control of corruption has significant effect in the reduction of corruption. The study recommends that Nigeria can use an amalgamation of ethics hotlines for reporting corruption, open-door policies to embolden subordinates to consult with bosses for guidance, a "zero-tolerance" policy for breaches, anticorruption training sessions, and complete transparency in governmental operations to minimize infractions. Nigeria will require strong political will and vision, credibility, frontal assault, new staff, deregulation, unconventional methods, close coordination, harnessing technology and tailoring international experience to local conditions.

1.0   Introduction

Ubiquity of corruption is the goliath of Nigeria. Its multi-dimensionality, density and gravity can only be depicted by the devastation done to the citizenry. Nigeria has witnessed the implementation of several anti-corruption policies and institutions but very few corrupt politicians, public office holders, oil and bank executives served hard justice commensurate with their transgressions. Massive, widespread and pervasive corruption deleteriously dominates and sways every stratum of governance such as security, education, energy and power. Over-obsession with political power at whatever cost, whether it's a "do-or-die" or "turning a blind eye" to corruption and the corrupt, political corruption is openly abetted by political elites, the ruling and the counter elites, through their indefensible actions of political accommodation.

According to Afolabi (2007) and Agbaje (2004), various forms of corruption in Nigeria consist of advanced fee fraud (known as 419), misappropriation or diversion of funds, kickbacks, money laundering, bribery, false declarations, abuse of office, unconventional and fraudulent trade practices, under- and over- invoicing, collection of illegal tolls, unauthorized use of resources for private gain, impairment of integrity, virtue or moral principles, misuse of official power for selfish motive, perversion of public rules, refusal to declare one's assets on the assumption and expiration of public office, using one's official status to foil the administration of justice, the thwarting of the electoral process to make free and fair election impossible and faulty recruitment of mediocre or totally unsuitable candidates in preference to candidates of high merit in the Nigerian Public Service. Corruption is inescapably pervasive in Nigeria; no one is free from it, either as a doer or as a victim (Iyanda, 2012). This

menace causes dawdling of files in offices, endless queues, port congestion, election irregularities, police extortions of toll fees and ghost workers syndrome.

Figure 01: Corruption in Nigeria
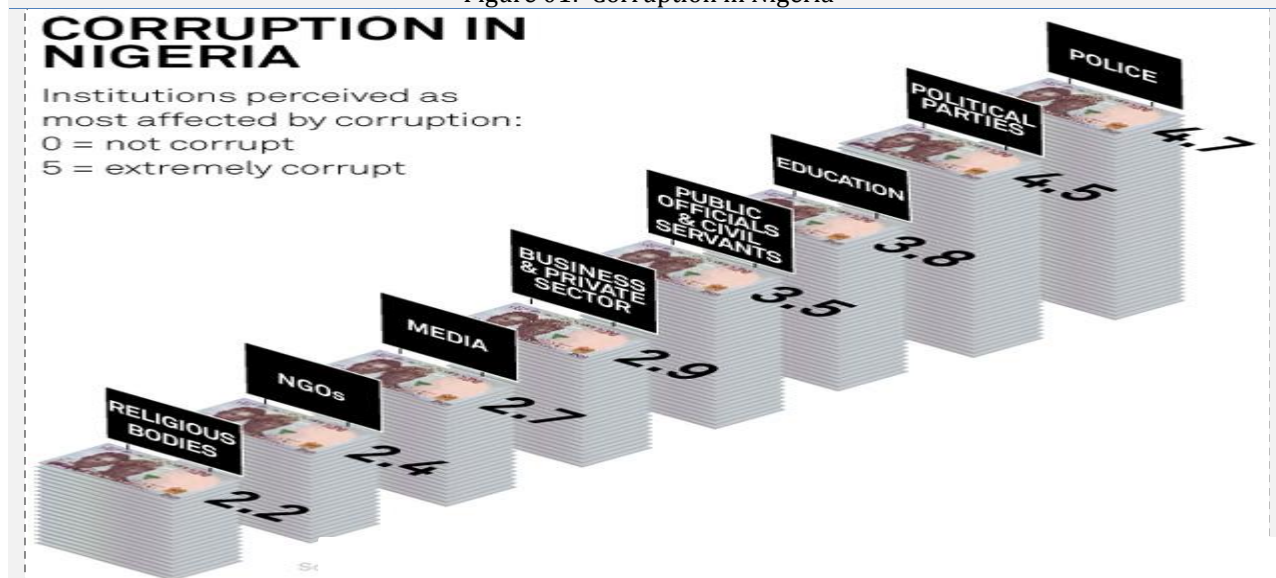
Source: Based on the data from Transparency International, this figure reflects how various institutions in Nigeria are perceived, by the public, as being worst affected by corruption.

Political corruption in Nigeria is prevalent and virulent, adequately filling the spectrum of cronyism, patronage, nepotism, graft and criminal enterprises, such as pipeline vandalism, piracy money laundering and even terrorism. The profligate consumption patterns of the political class, mostly, presidents, governors, commissioners, legislators and various accomplices, especially contractors and consultants are magnificent houses, multiple luxurious automobiles, first-class travel on airplanes, patronage of first-rate hotels, prime restaurants, and high-class stores all over the world. Moreover, annual physical and medical treatment is only obtainable abroad, all at taxpayers' detriment. Social engagements such as naming, birthday, wedding, and funeral ceremonies are mind-boggling; meta-sumptuous meals, ceaseless customized wines and champagne drinks. Coupled with this inanities is the dissolutely high-taste consumption patterns of their children; schools abroad, and "destination Weddings" at exotic locations abroad (PUNCH, 2014).

Discrepancy exists between Nigeria's wealth profile and her gloomy poverty level. Huge-scale political corruption fills the enormous void between the country's oil fortune and its being one of the poorest countries in the world. Nigerian realities are abject poverty, under-funded, under-equipped and under-staffed hospitals, schools and tertiary institutions; high quanta of youth unemployment and illiteracy; and, worst of all, decaying infrastructure, characterized by preposterous and erratic water and power supply, meager road networks, and derisory recreational facilities (PUNCH, 2014), portraying the devastation done to the citizenry. Insecurity and terrorism in Nigeria point accusing fingers at five decades of massive corruption, the inexcusable immunity of perpetrators and the almost outright neglect of the educational system funding.

Nigeria is as old as its corruption. Benjamin (2007) emphasized that corruption in Nigeria is traceable to the colonial era when Nigerians were bribed with various foreign goods in exchange for local products and slaves. Sowunmi (2010) concurred that the history of corruption in Nigeria is attributable to the twenty-nine years of stratocracy. Ribadu (2006) claimed that military regimes, one after another, trampled on the rule of law, expedited the inordinate plundering of the public treasury, truncated public institutions and deterred free speech. Corruption became enthroned and overriding, engendering and annihilation of the Nigerian good. Without doubt, the military took corruption to its festering pinnacle.

The Financial Action Task Force on Money Laundering (FATF) named Nigeria among the twenty three non-cooperative countries frustrating the effort of international community to fight money laundering (EFCC Establishment Act, 2002). Notwithstanding the establishment of anti-graft agencies, such as Independent Corrupt Practices and Other Related Offences Commission (ICPC) in 2000 and Economic and Financial Crimes Commission (EFCC) in 2003, corruption has continued unabated, enfeebling institutions and stifling investment. Politics is deplorably debased.

Figure 02: Nigeria – Corruption outcomes
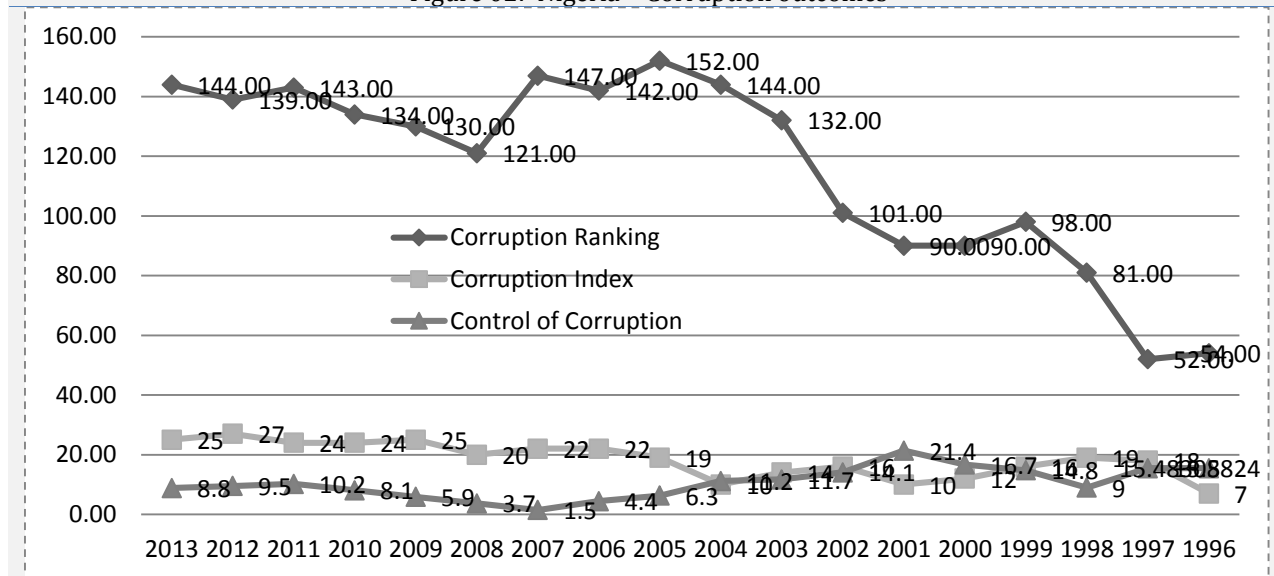
Source: Transparency International, 2013. Transparency International uses media reports and international assessments to rank each country on the perception of corruption relative to other countries.

In the recent *Transparency International's* 2013 assessment, Nigeria got a woeful 25 score out of 100 and was positioned 144 out of 177 countries surveyed. This ranking plunges Nigeria about two percentile points much lower than her 2012 ranking, meaning the malevolence of menacing corruption is rapaciously ballooning. According to ICPC (2014), corruption in Nigeria engenders governmental instability, emasculates democratic institutions and impedes economic development. Corruption erodes the basis of democratic institutions by twisting electoral processes, corrupting the rule of law and building bureaucratic quandaries. Not surprisingly, despite boasting one of the hugest crude oil earnings over the years, poverty and its abjectness ravage the country. The incidence, frequency and predominance of corruption in governance, public and private places crash all indices of development. At this instant, it is critical to evaluate the degree, extensity and gravity of the consequences of corruption on Nigeria, both at the aggregate and sectoral level. Accordingly, this study examines corruption effects on Nigeria in a bid to throw some light on the devastation done and activate the citizenry and policymakers to a positive change.

The rest of the paper is structured as follows: Section 2 affords a review of previous literature and theoretical perspectives. Section 3, then, presents a brief contextual analysis of the data and methodology employed while Section 4 presents the empirical analysis. Section 5 concludes.

2.0   Literature review

Does corruption almost always have detrimental consequences? This is an empirical question to which a set of empirical studies have been addressed, with conflicting results. Further, there is a substantial conflict between micro- and macro-level studies on the effects of corruption, complicating deductions (Kolstad, Fritz, and O'Neil, 2008).

Pelligrini and Gerlagh (2004) found that a one standard deviation fall in the corruption index increases private investment by practically 2.5 percent and pushes national output growth rate by roughly 0.34 percent. Treisman (2000) states that the level of GDP per capital is proportionate to the various corruption indicators. Fabayo et al (2011), using annual corruption perception index between 1996 and 2010, revealed that high level of corruption engenders low investment and thus low economic growth in Nigeria.

Adewale (2011), using Gross Domestic Product (GDP) as the dependent variable and Gross Capital Formation (CAPL), Money Supply (MS), Public Domestic Investment (PINV), Corruption Perception Index (CPI) External Debt (EXTD) and Unemployment Rate (UNEMPL) as the explanatory variables, found a significant negative relationship between corruption and output growth in Nigeria. Consistent with the hypothesis that corruption hinders growth, he concluded that corruption impedes economic growth in Nigeria.

In a related study, Akindele (2005) estimated a modified production function including labour, capital and political instability. He found that a significant negative relationship between corruption and economic development, concluding that corruption is hostile to the development of any economy. Nageri, Gunu and Abdul

(2013), using the Ordinary Least Square (OLS) regression technique for the Corruption Perception Index (CPI), the Corruption Rank (CR) of Nigeria and Relative Corruption Ranking (RCR) of Nigeria, revealed that corruption has a significant negative effect on economic growth and development. The study established the fact that corruption has harmed Nigeria, affecting the potential for growth to the extent that over $100billion in GDP has vanished.

Observing that corruption aids international passport racketeering, ghost-workers syndrome, election irregularities, traffic hold-ups on the highways, port congestion, loss of tax revenue, business diversion to neighboring countries, kidnapping and even ritual murders for money-making in Nigeria, Dike (2005) asserted that corruption amplifies the penury and misery of a disproportionate total of Nigerians.

Mauro (1997b) and Johnston observed that high rate of corruption creates a situation where investment returns are difficult to predict. Their conclusion showed that the effects of corruption are to limit investment, which is critical to the long-run sustainable economic growth. They further argue that corrupt behaviors have the tendency of scaring away foreign and local investors with significant adverse effect on the economy. Corruption wastes the limited resources of an economy, increases the costs of doing business thus signaling inflation, hence radically reduce revenues accruing to the state. It also results in poor service delivery, "moonlighting" or multiple concurrent sources of employment and refusal to perform normal functions without additional payment.

Alesina and Angeletos' (2005) study shows that large public projects in developing countries meant to reduce income inequality generate more prospects for corruption (i.e. through tax loopholes and corruption in the distribution and provision of public projects). Their model shows that policy makers will not reduce huge public projects, whereas doing so would lessen the latitude of corruption, because the price of corruption is worth paying, as it is most often the only means to ameliorate the status of the poor.

More than a few studies have focused on natural resources abundance (Leite and Weidmann, 1999), the role of democracy (i.e. Sung 2004; Chowdhury, 2004 and Bohara et al., 2004), regulatory burden and economic freedom (Chafuen and Guzmàn, 1999), decentralization and federalism (Fisman and Gatti, 2002; Arikan, 2004), and legal origins of a country (Glaeser and Shleifer, 2002) as determinants of corruption. In Nigeria, Akinpelu, Ogunseye, Bada, and Agbayangi (2013) studied the socio- economic determinants of corruption via co-integration test and vector error correction model. They established a long-run relationship between corruption and socio-economic variables in Nigeria.

Ndikumana (2007) asserts that sincere investors cannot afford to delay their investments until the tide of corruption reduces, and therefore engage in commercial activities with short-term maturity such as trade and speculative ventures. The persistence of such investment climate deters domestic investment. In other instances, foreign investors could divert their investment activities to countries where the level of corruption is comparatively lower. In short, investment is discouraged. Investment is necessary for economic growth through higher factor productivity and human capital development, and the attendant increased income and higher standard of living. The negative impact of corruption can exert greater multiplier effect on these major macroeconomic variables.

This review has shown that corruption has bad consequences, and has revealed the complex interaction between factors that tie corruption to development outcomes. Identifying the impacts of corruption is an ongoing process, with gradual accumulation of knowledge as new empirical evidence is added to the mix. Accordingly, this study furthers the literature by evaluating corruption effects on Nigeria via aggregate and sector estimates using VAR.

3.0   Data and methodology

The methodology used in this study is vector autoregressive (VAR) model. The estimated VAR model in this study comprises of ten macroeconomic endogenous variables: economic growth, government expenditure, and money supply. Simultaneous equations technique or structural modelling system has been critiqued as simply too limiting, and the choice of exogenous and endogenous variables is far too judgmental and arbitrary. On the other hand, in a VAR system, all the variables are endogenous and each can be a linear function of its own lagged values and the lagged values of the other variables in the VAR system. Each endogenous variable of the system is a linear function of the lagged values of the endogenous variables.

The VAR model is defined thus:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + c + \varepsilon_t \qquad\qquad (1)$$

Where:

y_t is a vector of m endogenous variables,
x_t is a vector of n exogenous variables,
$A_1, A_2, ..., A_p$ are matrices of the parameters to be estimated
c is the constant term

ε_t is a vector of terms generated by a white noise process with the following proprieties:

$$E[\varepsilon_t] = 0 \quad \forall t$$

$$E[\varepsilon_t \varepsilon'_t] = \begin{cases} \Omega & s = t \\ 0 & s \neq t \end{cases} \quad (2)$$

This shows that the ε's are not serially correlated.

Thus, after a detailed review of previous studies and filtering the theoretical postulates expounded above, the functional form of the model for this study is expressed as follows:
Y_i = (CORRUPTION, CONTROL)   (3)

Y_i represents INCOME, AGRICULTURE, BUILDING, SERVICES, INDUSTRY, WHOLESALE, EXPENDITURE, DEATH, LIFE, POVERTY, EMPLOYMENT, LITERACY
Where,

       CORRUPTION = Corruption Perception Index

       CONTROL = Control of Corruption Index

       EXPENDITURE = Recurrent government expenditure

       DEATH = Death rate, crude (per 1,000 people)

       AGRICULTURE = log of Revenue from agriculture sector

       BUIDING = log of Revenue from building and construction sector

       INDUSTRY = log of Revenue from industrial sector

       SERVICES = log of Revenue from services sector

       WHOLESALE = log of Revenue from wholesale and retail sector

       INCOME = log of Gross domestic product per capita

       EMPLOYMENT = Employment as % of GDP

       LIFE = Life expectancy

       LITERACY = Literacy rate

       POVERTY = Poverty index

Summarily, our investigative method comprises of four main steps. First, Kwiatkowski–Phillips–Schmidt–Shin (1992) (KPSS) stationarity test and Johansen and Juselius (1990) cointegration test are performed. Secondly, rather than arbitrarily selecting the lag lengths, Schwarz Information Criterion are used to choose the optimum lag length for each equation in the system. Third, we estimate the equations using VAR. Finally, the sufficiency of the lag specification for the system of equations is examined by performing the necessary diagnostic tests.

The data spans the year 1996-2013. The data employed in the empirical analysis was extracted from the data banks of the Central Bank of Nigeria and the World Bank. They are available on their sites www.cenbank.org/documents/data.asp, www.data.worldbank.org/Indicators and www.govindicators.org.

4.0   Empirical Results

Firstly, each of the time-series is tested to decide their order of integration, using the Kwiatkowski-Phillips-Schmidt-Shin stationarity test. Since most of the time series are I(1), we tested and saw they are not cointegrated, using Johansen and Juselius (1990) cointegration test. Thus, the VAR model is set up. 1 is the maximum lag-length for the variables in the VAR system, based on the Schwarz Information Criterion. Examining the adequacy of the lag specification for the VAR system of equations with the necessary diagnostic tests, the VAR is shown to be well-specified.

The result in the Table 1 (below) shows that not all the variables have unit root at first difference. While some of the variables are integrated at order one, others are integrated at order zero. This implies that our analysis can only be reasonable at VAR and will be meaningless at VEC (Vector Autoregression) level. The probability values indicate the significance of the integration of the variables at the different levels.

Table 1: Kwiatkowski-Phillips-Schmidt-Shin Stationarity Test							
Method					Statistic		Prob.**
Kwiatkowski-Phillips-Schmidt-Shin test statistic					-4.1419		0.02511
Series	t-Stat	Prob.	E(t)	E(Var)	Integration	Max Lag	Obs
D(CORRUPTION)	-2.71838	0.00916	-2.1672	0.8478	0	1	16
D(CONTROL)	-3.86994	0.039672	-2.1672	0.8478	0	1	16
D(AGRICULTURE)	-3.33839	0.025691	-2.1672	0.8478	0	1	16
D(BUILDING)	-3.28165	0.047015	-2.1672	0.8478	0	1	16
D(DEATH)	2.894388	0.009999	-2.169	0.975	1	1	15
D(EMPLOYMENT)	-1.49914	0.013426	-2.1672	0.8478	0	1	16
D(EXPENDITURE)	-3.15993	0.026893	-2.1672	0.8478	0	1	16
D(INCOME)	-1.31508	0.005477	-2.1672	0.8478	0	1	16
D(LIFE)	-3.1608	0.006723	-2.1672	0.8478	0	1	16
D(INDUSTRY)	-2.98976	0.006523	-2.169	0.975	1	1	15
D(LITERACY)	-2.44393	0.0001	-2.1672	0.8478	0	1	16
D(POVERTY)	-3.40404	0.018501	-2.169	0.975	1	1	15
D(SERVICES)	-3.27202	0.006319	-2.1672	0.8478	0	1	16
D(WHOLESALE)	-1.36169	0.028993	-2.169	0.975	1	1	15

Table 1a: Vector Autoregression Estimates							
	AGRICULTURE	BUIDING	INCOME	INDUSTRY	SERVICES	WHOLESALE	EXPENDITURE
CONTROL(-1)	0.007188	0.010560	-0.000152	0.000482	0.003021	0.010871	0.005785
	(0.00165)	(0.01317)	(0.00071)	(0.01150)	(0.00066)	(0.00179)	(0.01636)
	[4.35205]	[0.80204]	[-0.21431]	[0.04187]	[4.60850]	[6.08664]	[0.35372]
CORRUPTION(-1)	0.063801	0.154700	-0.002023	-0.083250	0.171499	0.118557	0.070211
	(0.02019)	(0.16097)	(0.00869)	(0.14065)	(0.00802)	(0.02184)	(0.19995)
	[3.15970]	[0.96107]	[-0.23272]	[-0.59189]	[21.3967]	[5.42960]	[0.35114]

Table 1b: Vector Autoregression Estimates							
	LIFE	POVERTY	CONTROL	CORRUPTION	DEATH	EMPLOYMENT	LITERACY
CONTROL(-1)	0.016380	-0.261742	-0.663314	0.015749	-0.026216	0.008397	0.081560
	(0.00159)	(0.28039)	(0.63527)	(0.04638)	(0.01265)	(0.08865)	(0.11831)
	[10.3049]	[-0.93350]	[-1.04414]	[0.33958]	[-2.07211]	[0.09472]	[0.68939]
CORRUPTION(-1)	0.357244	-2.635318	-3.583416	0.173934	-0.022977	0.454552	-0.771377
	(0.01943)	(3.42782)	(7.76644)	(0.56698)	(0.15467)	(1.08384)	(1.44635)
	[18.3837]	[-0.76880]	[-0.46140]	[0.30677]	[-0.14855]	[0.41939]	[-0.53333]

Standard errors in ( ) & t-statistics in [ ]
The table 1 shows corruption effects on aggregate and sectoral components of the Nigerian economy. If the t-statistics is more than 2, the variable in question has a significant impact on the dependent variable.

For the agricultural sector, estimates for both CONTROL and CORRUPTION are positive and significant using t-statistic tests. In other words, the higher the control of corruption, the less the corruption and the more revenue accrues to the agricultural sector. In Nigeria, the agricultural sector is riddled with corruption of all ramifications. For example, agricultural extension service providers have not been faithful, diverting most of the inputs intended for farmers use (Bawa, Ani and Nuhu, 2010). To a very large extent, this leads to poor agricultural productivity and growth in revenue a mirage.

For the building and construction sector, estimates for both CONTROL and CORRUPTION are positive but insignificant. For per capita income, estimates for both CONTROL and CORRUPTION are negative as well as insignificant. For the industrial sector, the estimate for CONTROL is positive while for CORRUPTION, it is negative; both are insignificant. For the Services sector, estimates for both CONTROL and CORRUPTION are positive and significant. In other words, the higher the control of corruption, the less the corruption and the more the revenue accruing to the services sector. This is a great eye-opener, but much triumph has not been attained in attempts to uproot corruption from the Nigerian public service. As a matter of fact, in 1966, Major Nzeogwu staged a coup on the grounds that public service was holed in corruption and that politicians and public servants collected 10% kick-backs for contracts awarded (Njoku, 2010).

As per the Wholesale and Retail sector, estimates for both CONTROL and CORRUPTION are positive and significant. In other words, the higher the control of corruption, the less corruption and the more revenue accrues to the Wholesale and Retail sector. For recurrent expenditure, estimates for both CONTROL and CORRUPTION are positive but insignificant. For poverty, employment and literacy, estimates for both CONTROL and CORRUPTION are insignificant. CONTROL has positive significant impact on CORRUPTION, meaning the more control of corruption, the less corruption. For life expectancy, estimates for both CONTROL and CORRUPTION are positive and significant. In other words, the higher the control of corruption, the less corruption and the more the expected number of years of life remaining at any given age. The most surprising finding is that, in Nigeria, CONTROL has negative but significant impact on death rates, meaning the more the control of corruption in Nigeria, the less the death rates.

5.0   Conclusion and recommendations

Evaluating corruption effects on Nigeria, this study contends that corruption is wicked and perilous to the nation. The empirical estimates portrays that corruption affects most significantly agriculture, services, wholesale and retail sectors in Nigeria. As well, the more the control of corruption, the less the corruption and the more the expected number of years of life remaining at any given age in Nigeria. The most surprising finding is that, in Nigeria, the more the control of corruption, the less the death rates and the vice versa. If corruption is so detrimental and deadly to Nigeria, how do we stop the practice?

First, Nigeria needs to develop a cross-industry, cross-regional and cross-religious sharing program of best practices, with a set of stringent values to follow. Nigeria can use an amalgamation of ethics hotlines for reporting corruption, open-door policies to embolden subordinates to consult with bosses for guidance, a "zero-tolerance" policy for breaches, anticorruption training sessions, and complete transparency in governmental operations to minimalize infractions. The fight against corruption must include every Nigerian. Everyone has to be committed and by all means must pursue the corrupt and punish them. Informed voters, local clubs and associations, civil society organizations, and local political bosses (party leaders, educated professionals, chiefs and monarchs,) need to educate voters about the sapping effects of corruption and the need for radical change. Attitudinal reorientation is necessary with respect to sincerity, selflessness, dedication, sacrifice, and dignity above money.

Conquering corruption in Nigeria will require strong political will and vision, credibility, frontal assault, new staff, deregulation, unconventional methods, close coordination, harnessing technology and tailoring international experience to local conditions. Many of these are already obvious. Yet, what will bring our triumph is the comprehensiveness, pace, boldness, and sequencing of these reforms.

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