Corruption and Economic Growth in Nigeria: 1986 -2007

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ABSTRACT

The World Bank (2000) asserts that corruption is the single greatest impediment to economic growth in third world countries. This study was set out to investigate the impact of corruption on economic growth in Nigeria from 1986 to 2007. A Barro-type endogenous growth model was adopted and reconditioned to suit the purpose of the paper. The Engle-Granger (1987) cointegration and error correction mechanism (ECM) techniques were employed to unit root properties of the variables, their long run relationship and to determine values of long run parameters. The results show that corruption exerts significant direct effect on economic growth and indirectly via some critical variables examined by the paper which include Government Capital Expenditure, Human Capital Development and Total employment. The paper discovers that about 20% of the increase in government capital expenditure ends up in private pockets. It is, therefore, recommended that the government should consolidate on its efforts to fight corruption to a standstill in the country.

1.0   Introduction

Though corruption was not given an explicit recognition in the traditional economic growth theories, it has now become a globally recognized policy variable especially in less developed countries where it is considered more critical for the attainment of long-term economic growth and sustainable development. Over the years, several studies including Mauro (1997) Akkihal, Smith & Adkins (1997) and Voskanyan (2000) have shown that corruption is capable of generating undesirable results even from excellent economic policies and development plans. Little wonder, World Bank (2000) identified corruption as the single greatest obstacle to economic and social development as it distorts the rule of law and weakens the institutional foundations which economic growth depends. Corruption has also been described as a deadly virus that attacks the vital structures that makes for a society's progressive functioning. This is clearly the case in a developing country like Nigeria, where limited resources that are initially earmarked for industries, hospitals, schools and other infrastructure are either out rightly embezzled, misappropriated, or otherwise severely depleted through kickbacks and over-invoicing by government officials (Gire, 2001). Unfortunately, Nigeria has consistently been classified as a leading icon among the most corrupt nations of the world based on the annual Corruption Perception Index (CPI) of the Transparency International (TI). Hence, the pressing need for the government, policy makers and academics to pay keen attention to the issue of corruption and its attendant effects in Nigeria.

There exist a plethora of studies assessing the relationship between corruption and economic growth but their findings have not only been diverse but also conflicting. This implies that views on corruption-economic growth nexus remain polarized among economists and policy makers. A school of thought made up of proponents like Leff (1964), Huntington (1968), Summers (1977) and Lui (1985), are of the opinion that corruption is beneficial grease that lubricates the engine of economic growth. For Instance, Acemoglou and Verdier (1998) argue that some degree of corruption may be part of the optimal allocation of resources in the presence of incomplete contracts or due to market failure. This opinion is partly justified on the ground that illegal payments are required to make things pass swifter and favorably through the state bureaucracy (Amundsen, 2000). By implication, corruption has the potency of making an economic agent more efficient and in the long run it promotes economic growth.

On the contrary, the second school of thought contends that corruption exerts adverse effects on long-term economic growth and sustainable development. A host of scholars and international organizations constitute the proponents of this view. Specifically, Amaro-Reyes (1983), Mauro (1995), UNDP (1997), Wei (1997), Kaufmann (1997), World Bank (2000) among others hold the opinion that corruption has a corrosive effects on economic growth and development. The transmission mechanism of these adverse effects include declined domestic and foreign investment, increased cost of production, misallocation of national resources, increased inequality and poverty, uncertainty in decision making among others. Overwhelming statistical evidence supporting this claim exists in numerous recent studies.

Some writers argue that the public servants contrive set of rules or over apply existing ones to perpetrate corruption. According to Wei (1998) and Tanzi (1998) state that labyrinthine government regulations create fertile grounds for government officials to extract rents, whereas an economy where government's role is

minimal is less likely to breed corruption. Mauro (1995) and Kaufmann and Wei (1998) show that corruption index and the index of government regulation are positively correlated.

Given this knowledge gap, the main objective of this study is to assess the impact of corruption on economic growth in Nigeria via its effects on physical capital, human capital and labor. While introduction occupies section one, the rest of the paper is decomposed into four sections. Section two covers review of related empirical literature and theoretical issues while section three presents the methodology of the paper. Section four captures presentation and analysis of results and the final section, which is section five, contains summary and recommendations of the paper.

2.0 REVIEW OF RELATED EMPIRICAL LITERATURE

There is no consensus on the exact meaning of corruption. Many writers have defined it differently under different conditions to encompass a wide range of conduct of misconduct. For instance, El- Rufai (2002) opines that corruption covers a wide range of social misconduct raging from massive fraud, extortion, embezzlement, bribery, nepotism, influence peddling, bestowing of favors to friends, rigging of elections, abuse of public property, sale of fake or expired drugs, etc. Blackburn *et al* (2002) describe corruption as a clandestine activity which takes place away from the glare of publicity and which, therefore is difficult to measure empirically. Painstakingly, Rose-Ackerman (1999) laments that corruption exists when institutions established to regulate the interrelationships between the citizens and the state are used instead for personal enrichment and provision of benefits to the corrupt and undeserving.

Besides, there numerous recent empirical studies that have investigated the effects of corruption on economic growth in different countries. Beginning with the pioneering work of Mauro (1995) which examined the effect of corruption on growth rates of per capital GDP of sixteen countries from 1960-1985. The result of this systematic study shows that one-standard deviation decline in the corruption index leads to an increase in annual growth rates of GDP per capital by 0.8 percent. In yet another study Mauro (1997) shows that the size and composition of government expenditure is significantly affected by corruption. The study found that corruption tends to make public expenditure neglects education and health in favor of sectors where corruption might not be perceived easily. This will have adverse effect on growth in the long run. In the same vein, Tanzi and Davoodi (1997) investigated the effect of corruption on the size and composition of public expenditure and came up with multiple findings which according to Akai *et al* (2005) include the following.

 a. Corruption tends to increase the size of public investment such that the items of the expenditure are easily manipulated by high level official to obtain bribe.

b. Corruption skews the composition of public expenditure away from needed operations and maintenance towards expenditure on new equipment.

c. Like the findings of Mauro (1997), corruption skews composition of public expenditure away from needed health and education funds.

d. Corruption reduces the productivity of public investment and that of the country's infrastructure.

e. Corruption has the tendency to reduce tax revenue because it compromises the government's ability to collect taxes and tariffs.

Rahman *et al* (1999) examined the impact of corruption on the economic growth and Gross Domestic Investments of Bangladesh. The overall result of the study indicates that corruption reduces economic growth by reducing Foreign Direct Investments (FDI). Similarly, Mauro (1998) found that corruption also affects domestic investments negatively and economic growth is adversely affected in the long run. Also, Wei (1997) using data set from fourteen (14) countries found that the prevalence of corruption in a recipient country discourage foreign investment. He obtained the coefficients –0.09 and –9.92 for corruption and host country's marginal tax rate respectively.

Furthermore, Mo (2001) estimated a direct and indirect effect of corruption on economic growth using a long term growth rates of per capital GDP from 1970 to 1985. The study identifies three transmission channels namely, investment, human capital and political stability. A regression is run using the corruption perception index of Transparency International, variables measuring the three transmission channels and other control variables. The result indicates that one unit increase in the corruption index reduces the growth rate by about 0.545 percentage point. However, the direct effect of corruption becomes insignificant in both ordinary least squares (OLS) and two-stage least squares (2SLS) estimation after controlling other variables. A strand of studies has also shown the link between corruption and poverty. For instance, Rose-Ackerman (1997) found that corruption aggravates the problem of poverty through the following channels.

a. The poor will receive a lower level of social services.

b. Infrastructure investment will be biased against projects that will aid the poor.

c. The poor may face higher tax or fewer services.

d. The poor are disadvantaged in selling their agricultural produce.

e. Their ability to escape poverty using indigenous small-scale enterprise is diminished.

Similarly, Gupta *et al* (1998) found that corruption increases income inequality and poverty by lowering economic growth, promoting a biased tax system in favor of the rich few, lowering social spending, reducing access to education and reducing the effectiveness of targeting social programs. Treisman (2000) discovers that rich countries are generally rated as having less corruption than poor countries with as much as 50 to 73% of variations in corruption indices accounted for by variations in per capita income levels.

Empirical evidence suggests that corruption affects economic growth in two ways: first, there appears to be a robust negative correlation between level of corruption and economic growth, Gould and Amaro-Reynes (1983) Mauro (1995, 1997), United Nations (1989), Tanzi and Davoodi (1997) find evidence that bureaucratic malpractice manifests in the diversion of public funds to where bribes are easiest to collect, implying a bias in the composition of public funds towards low-productivity projects at the expense of value enhancing investments. Second, there is a two-way causal relationship between corruption and economic growth: bureaucratic rent-seeking not only influences, but is also influenced by the level of development.

Also, Abed and Davoodi (2002) examined the impact of corruption in transition economies using a panel and cross-sectional data for twenty-five (25) countries over the period of 1994-1998. The results show that higher economic growth is associated with lower corruption in both panel and cross-sectional regressions and it shows significance at one percent level. Also, Rock and Bonett (2004) found that corruption significantly promotes economic growth in the newly industrializing economies of East Asia including China, Indonesia, Thailand and Korea. And although Pellegrini and Gerlagh (2004) found that the negative effect of corruption on economic growth, the coefficients of the 2SLS regression model were insignificant. Aliyu (2007) using distributed lag model in a study on democracy, corruption and economic development in Nigeria found strong evidence suggesting that democratic regime promotes economic growth and development. The study could not find strong evidence suggesting positive or adverse relationship between corruption and development in the sample.

It follows from above that empirical studies indicate at best, mixed and in some instance, conflicting results. This can be attributed in part to problems of methodology in these studies. For instance, some of those studies used cross-national data thereby making it difficult to control for a number of cultural, historical, institutional, and qualitative differences in administrative rules and practices among others.

2.1   THEORETICAL FRAMEWORK

Various theories of economic growth ranging from the classical to the endogenous theories were propounded to identify and explain the various variables influencing growth. While the classical theorists laid much emphasis on capital as major determinant of economic growth, neoclassical extended the Harrod-Domar classical formulation by the inclusion of labor and the introduction of a third independent variable, technology, to the growth equation, (Solow, 1956 and Swan, 1956). Two major drawbacks of this theory include (i) the impossibility of analyzing the determinants of technological progress within its framework. (ii) the failure of the model to explain the large differences in the residuals across countries with similar technologies. These led to a widespread discontentment with the neoclassical models (Todaro, 2003)

Endogenous Growth Models were developed as a response to the criticisms of the neoclassical growth model and to offer better explanation of the process of long-run economic growth. The theory views innovation brought about by investment in knowledge generation as the driving force of long term economic growth (Romer, 1986). More importantly, variants of endogenous growth models including Lucas (1988) Model, Jones and Manelli (1990) Model, Barro (1990) Model, AK models of Rebelo (1991) etc, have demonstrated that policy variables can have significant impact on long-run economic growth. This paper adopts the famous Barro (1990) model which is an outgrowth of Ram (1986) model. This is because the model permits the inclusion of a wider range of policy variables including corruption. This model provides both the theoretical foundation and analytical tool for analysis of impact of corruption on economic growth in Nigeria. The model assumes the economy is comprised of public sector (G) and Private sector (P). Since the investment by the public sector in infrastructure can make private sector more profitable, it is assumed that the output of (G) exerts some externalities on the output of the private sector. The model also assumes that government levies an income tax and runs a balanced budget. It uses a production function of the form

$$Y = G^{\beta} K^{\alpha} L^{1-\alpha} \tag{1}$$

Where: Y = Total output of the economy

G = Public sector input

K = Private physical capital

L = Labor input

α = Contribution of capital to

aggregate output

1- α = Share of output per worker

β = Contribution of public sector to

aggregate output

G = tY (government is assumed to

levy tax and run balanced

budget)

$$tY = t\, G^{\beta} K^{\alpha} L^{1-\alpha}$$

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

$$G = g(Lg, Kg) \tag{2}$$

While that of the Private Sector is given as:

$$P = p(Lp, Kp, G) \tag{3}$$

The Total factor inputs

$$LT = Lg + Lp \tag{4}$$

$$KT = Kg + Kp \tag{5}$$

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

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

$$Y = g(\,Lg + Kg\,) + p(\,Lp + Kp + G) \tag{6}$$

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

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

$$Y = KT + LT + G + C \tag{7}$$

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

Equation (8) is the estimated equation

Where λ measures the effect of corruption on aggregate output

3.0 MODEL SPECIFICATION

In line with studies by Mo (2001) and Anorou and Braha (2004) in which they identified the direct and indirect effects of corruption on economic growth and in line with above specification of Barro's model, this paper adopts the endogenous growth model. Like it was said earlier, the model permits the inclusion of more policy variables in economic growth equation. Specifically, the model was modified to include the corruption index as one of its explanatory variables. Relevant equations were formulated to capture the disaggregated effects of corruption on economic growth. In all four different specifications/ equations were formulated and these are given as follows:

GDP = f(GCE, TEM, TSE, COR)

The regression form of the model is written as:

$$Y = \alpha_O + \alpha_1 GCE_t + \alpha_2 TEM_t + \alpha_3 TSE_t + \ldots\ldots$$

$$+ \alpha_4 COR_t + \mu \qquad (9)$$

Where: $\alpha_1, \alpha_2, \alpha_3 > 0; \quad \alpha_4 <> 0$

GDP = Gross Domestic Product (a proxy for economic growth)

TSE = Tertiary School Enrolment (proxy for human capital)

GCE = Capital Expenditure (a proxy for physical capital)

TEM = Total Employment figure (a proxy for labor)

COR = Corruption Perception Index

$\alpha 0$ = Constant term, $\alpha 1$ = Coefficient of GEX, $\alpha 2$ = Coefficient of TEM, $\alpha 3$ = Coefficient of TSE, $\alpha 4$ = Coefficient of COR and μ = Error term

Equation (9) above captures the direct effect corruption on economic growth. In addition, equations (10 – 12) below were formulated to account for the indirect effect of corruption.

To assess the effect of corruption on physical capital we use the equation;

$$GCE_t = \beta_0 + \beta_1 TSE_t + \beta_2 TEM_t + \beta_3 COR_t + \mu \qquad (10)$$

Where: $\beta_0, \beta_2, \beta_3 > 0, \beta 1 <$ or > 0

To assess the effect of corruption on human capital we adopt the equation;

$$TSE_t = b_0 + b_1 GCE_t + b_2 TEML_t + b_3 COR_t + \mu_t \qquad (11)$$

Where: a0, b2, b3 > 0, b1 < or > 0

To assess the effect of corruption on labor we adopt the equation;[6]

$$TEM_t = \gamma_0 + \gamma_1 GCE_t + \gamma_2 TSE_t + \gamma_3 COR_t + \mu_t \qquad (12)$$

Where: $\gamma_0, \gamma_3 > 0, \gamma_2 < 0, \gamma_1 < $ or $ > 0$

3.1 Definition and Measurement of Variables

Gross Domestic Product (GDP)

This is the socio-economic indicator that is used to measure economic growth of a country. It is the value of all final goods and services produced within the geographical boundary of a given nation during a specified period of one year divided by consumer price index. This was converted into natural log and was differenced once

Government Capital Expenditure (GCE)

These are expenditure on the provision of capital and development projects by the Federal government. This is made up of expenditure incurred on the construction of basic infrastructure like roads, bridges, power stations etc., investment in plants and machinery etc. This was obtained from the publications of Statistical Bulletin of Central Bank of Nigeria (CBN).

Total Employment (TEM)

The number of people, both male and female, that were employed in a particular country. It consists of both full-time and part-time workers. Data on this was sourced from the annual publications of the Nigerian Bureau of Statistics (NBS).

Tertiary School Enrolment (TSE)

It is defined as the number of students attending tertiary institutions in a given country. Tertiary institutions are comprised of universities, Polytechnic and colleges of education, Todaro (2003). It served as a proxy for human capital in the model.

Corruption Perception Index (COR)

This is a composite index based on the surveys of business experts and analysts giving insight into the perceived level of corruption in many countries. The Transparency International has consistently published this index annually since 1995 and it has been used to measure corruption in recent studies.

3.3 Estimation Techniques

This study employed quantitative tools of data analysis and interpretations were based on standard econometrics principles. First, a unit root test was conducted to determine the time series properties of data collected on GDP, physical capital, human capital, total employment and corruption perception index. This is with a view to establish whether there is the presence of unit root in the series because when time series data is

characterized by a unit root or in other words is non-stationary, regression analysis conducted in a conventional way, yield spurious regression results. This according to Granger and Newbold (1974) is indicated by high value of R^2 with a low value of Durbin Watson statistic. To this effect, the Augmented Dickey Fuller (ADF) test statistic is specified as follows:

Additionally, according to Engle-Granger (1987) state that when variables were found to be I(1), stationarity of residual (obtained from a static regression) implies cointegration. Meaning that a long run equilibrium condition exist between the dependant and independent variables. The residual series is included in the regression as an error correcting mechanism. Long run regression results are obtained by traditional ordinary least square (OLS) technique.

4.1   Empirical Results and Discussion

Results of the ADF test applied to all the variables presented on table 1 show that all the series were I(1). The hypothesis of presence of unit root is rejected for all at 5 percent or better level. The decision rule states that null hypothesis is rejected when ADF test statistic is greater (in absolute terms) than the MacKinnon critical value for each variable. This implies that all the series are stationary as reported below at their first difference.

Table 1

Augmented Dickey Fuller tests for Unit Root

Variables	ADF Test Statistic	Critical Values	Order of Integration
GDP	- 4.51	-2.83*	I(1)
GCE	-2.41	-1.97**	I(1)
TSE	-2.73	-1.98**	I(1)
TEM	-3.27	-3.22**	I(1)
COR	-3.39	-3.21**	I(1)

Source: Computed from E-view 4.0 by the researcher

* indicates significance at 1%, ** indicates significance at 5%

 The next step to take is to conduct a cointegration test on the residual to investigate whether or not the presence of cointegration relationship.

4.2 Tests for Cointegration

Since all the variables are integrated at their first difference, the next is we employed the Engle-Granger two-step method to check for any cointegration relationship between the dependent and independent variables. Residual obtained from static regression of equations (9), (10), (11) and (12) is tested and the results are reported on table 2.

Table 2: Engle-Granger Cointegration Test

Variable	ADF Test Statistic	Critical Value	Order of Cointegration
ECM_1	-2.11	-1.98**	I(0)
ECM_2	-4.06	-2.83*	I(0)
ECM_3	-2.54	-1.98**	I(0)
ECM_4	-1.67	-1.63***	I(0)

Source: Computed from E-view 4.0 by the researcher

One, two and three asterisks indicate significance at 1, 5% and 10% respectively

The result for equation (9) and (11) that are, ECM_1, ECM_2, above show that the null hypothesis of no cointegration is rejected at 5% because the decision rule states that the null hypothesis should be rejected if ADF test statistic is greater than critical values in absolute terms. While result of ECM_2 shows cointegration at 1% level of significance, the result of ECM_4 shows cointegration at 10% level. The Engle-Granger (1987) two-step methodology provides that if residuals are stationary integrated of order zero, that is, I(0) then the variables that generated the residuals are said to be cointegrated. Thus, we conclude that there exist stable long run equilibrium relationships among variables in the specified equations. The next step in the Engle-Granger criteria is to estimate the dynamic model by incorporating the adjustment variable of error correction mechanism on the list of regressors.

4.3 Results of Dynamic Error Correction Model

Effect of Corruption, Physical and Human Capital and Labor on Economic Growth)

The long run specification of equation 9 produces a parsimonious error correction model through an iterative process with the following results presented on table 3. The results show that on the overall, the model is very robust and exhibits a strong predictive power with a goodness measure, that is, the coefficient of multiple determination (R^2) at 0.99. This implies that 99% of the total variation in Nigeria's RGDP is explained

by variables captured in the model while remaining 1% change in RGDP is accounted for by other variables outside the model. The goodness of fit of the model is further confirmed by an adjusted R^2 of 0.98 meaning that 98% of variation in the dependent variable is accounted for by our regressors inclusive of the error correcting variable.

Secondly, Durbin-Watson statistic of 1.78 indicates the absence of autocorrelation at 1% level of significance. Also our F-statistic, which tests for overall significance of the regressors, shows that the variables in the model are jointly significant statistically at 99% level of confidence.

Table 3

Estimated Parsimonious Error Correction Model

(Dependent Variable: DLOG (RGDP))

Variable	Coefficient	t-statistic
C	-0.0729	-20.76*
DLOG(TSE(-4))	-0.0196	-2.13***
DLOG(GCE)	-0.1408	-12.74*
DLOG(TEM(-3))	0.1273	3.25**
D(COR(-1))	-0.0369	-2.44**
$ECM_1(-1)$	-0.6783	- 9.21*
R^2	0.996	
Adjusted R^2	0.988	
D.W statistic	1.79	
F-calculated	124.7	
Probability of F-stat	0.008	

Source: Computed from E-view 4.0 by the researcher

One, two and three asterisks indicate significance at 1, 5 and 10% respectively.

At specific levels, the estimate of error correction variable, the adjustment parameter is theoretically consistent and statistically significant at 1% level. This shows a very fast and robust speed of adjustment in the model. The coefficient of corruption reveals that there is a negative relationship between economic growth and corruption. The value of the coefficient suggests that a unit rise in corruption by 1 percentage point in Nigeria would reduce economic growth by about 4%. This result is consistent with the findings of Mauro (1998), Mo (2001), Anoruo and Braha (2004), but, inconsistent with that of Aliyu (2007).

The model estimate also shows a positive relation between labor and economic growth. This implies that an increase in labor employment would bring about increase in productivity or economic growth. The coefficient of the estimate is statistically significant at 5% level of significance. Furthermore, our result shows that the coefficients of tertiary school enrolment (TSE) and government capital expenditure (GCE) do not have the expected signs, although they were all statistically significant at 10 and 1% respectively. This could be as a result of the presence of corruption in the model, which is expected to impact negatively on both variables.

The effect of Corruption, Human Capital and Labor on Physical Capital

This subsection analyses the effect of corruption (COR), human capital (TSE) and labor (TEM) on physical capital, that is, on government's capital expenditure (GCE). Already in the previous section the Engle-Granger (1987) methodology has established a cointegration relationship between the variables in the model. A parsimonious model from equation (10) was arrived at through an iterative process and the results are presented on table 4.

Table 4: Result of Parsimonious Error Correction Model

Dependent Variable: LOG(DGCE)

Variable	Coefficient	t-statistic
C	0.0571	0.772
DLOG[TSE(-1)]	0.7471	2.63**
DLOG[TEM(-1)]	-1.3986	-1.82
D[COR(-1)]	0.197	1.13
$ECM_2(-1)$	-1.6512	-5.41*
R^2	0.8487	
Adjusted R^2	0.7478	
D.W	1.65	
F-statistic	8.41	
Probability of F-stat	0.012	

Source: Computed from E-view 4.0 by the researcher

One, two and three asterisks indicate significance at 1, 5 and 10% respectively.

The measures of credibility of the model, which are R^2, D.W and F-test all indicate that the model is robust and of good fit. The coefficient of multiple determination (R^2) is very strong at 0.848 meaning, about 85% of the variation in government capital expenditure is explained jointly by the regressors. The value of D.W shows absence of autocorrelation in the model. Furthermore, the value of F-statistic of 8.41 shows that our regressors are jointly significant at 1% level.

Specifically, the results show that the coefficient of corruption, although not statistically significant, impacts positively on the level of government capital expenditure. Corruption has a coefficient of 0.197 and this shows that a unit rise in corruption level will induce increase expenditure by about 20%, which raises that possibility of corruption. This result lends credence to the findings of Mauro (1995) and Davoodi (1997) who argue that corruption skews the composition of public expenditure away from needed operations, such as education and health, towards expenditure on new equipments.

The results also indicate that TSE is positively related to capital expenditure with a coefficient of 0.74. This implies that an increase in school enrolment by one thousand would bring about a rise in capital expenditure by N7.4m. This result is statistically significant at 5% given a calculated t-statistic of 2.63 against a theoretical t value of 2.26. Results further reveal that TEM figures impact negatively on capital expenditure, although the coefficient is statistically significant.

Finally, the coefficient of the error term ECM_2 associated with equation (10) wears a correct sign. It indicates that 165% of the shock is eroded in very subsequent year which implies a fast adjustment process of the previous year shock back to the equilibrium.

The Effect of Corruption, Physical Capital and Total Employment on Human Capital

This subsection examines the effect of corruption, physical capital and employment level on human capital. Equation (11) was enlarged to incorporate the error correcting variable and through iterative method, the following results on table 5 from a parsimonious error correction model were arrived at.

Table 5 : Result of Parsimonious Error Correction Model

Dependent Variable: DLOG (TSE)

Variable	Coefficient	t-statistic
C	0.083	2.75
DLOG(GCE)	0.340	4.59*
DLOG[TEM(-1)]	-0.919	-2.85
D[COR(-1)]	-0.481	-4.91*
$ECM_3(-1)$	-0.749	-3.55*
R^2	0.884	
Adjusted R^2	0.792	
D.W	1.30	
F-statistic	9.58	
Probability of F-stat	0.026	

Source: Computed from E-view 4.0 by the researcher   -One asterisk indicates significance at 1%.

Our model indicates a strong R^2 at 0.88, which implies that 88% of the total variation in tertiary school enrolment (TSE) is jointly explained by the regressors contained in the model. If we further consider an Adjusted R^2 of 0.79, we can safely conclude that our model has a good fit. The regressors altogether, are statistically significant given a computed value of F-statistic of 9.58 is significant at 1percent level. However, our D.W statistic of 1.30 reveals the presence of autocorrelation in the model. The presence of autocorrelation undermines the efficiency of the model, but does not affect the unbaisedness and consistency properties of the model.

The model also reveals a significant negative relationship between corruption and human capital development such that a unit increase in the level of corruption will reduce tertiary enrolment by about 5%. The result is not surprising because national resources that would have been used to expand the capacity of our existing tertiary institutions and possibly build new ones are unrepentantly siphoned or embezzled by corrupt public servants. This no doubt exerts deleterious effect on economic growth in the long run. Our t-statistic suggests that the impact is statistically significant at 0.05 levels of significance. In addition, the result shows that government capital expenditure has a positive impact on human capital development in Nigeria. The implication is that a unit increase in government spending on education will enhance the ability of tertiary institution to absorb more students into the system by up to 34%.

However, the result shows an inverse relationship between the level of total employment and tertiary school enrolment, although the coefficient of the former is not significant statistically. This is because working and schooling are to a certain extent mutually exclusive. Besides, level of unemployment among school leavers, in recent years is on the high increase. Lastly, the coefficient of the error correcting variable, ECM_3, bears the expected sign and the value suggests that there is a fast adjustment process of the previous year's shock.

The Effect of Corruption, Human Capital and Tertiary School Enrolment on Labor

The last category of effect examined by the paper is that of corruption, human capital and tertiary school enrolment on the level of employment of labor. While theoretically, the coefficient of corruption is less and that of tertiary school enrolment is greater than zero; that of human capital may assume any sign between negative and positive. The result of the dynamic specification of equation (12), which incorporates the error correcting term, is presented on table 6 as follows.

Result of Parsimonious Error Correction Model

Dependent Variable: DLOG (TEM)

Variable	Coefficient	t-statistic
C	0.077	11.08*
DLOG(GCE(-4))	0.035	2.10
DLOG(TSE(-4))	-0.199	-6.66*
D(COR(-1))	-0.155	-6.95*
$ECM_4(-1)$	-0.326	-4.41*
R^2	0.975	
Adjusted R^2	0.941	
D.W statistic	1.20	
F-calculated	28.92	
Probability of F-stat	0.009	

Source: Computed from E-view 4.0 by the researcher

One, two and three asterisks indicate significance at 1, 5 and 10% respectively.

Like in the previous models, the above model has a good fit and the same robustness considering the high value of R^2 and adjusted R^2 of 0.97 and 0.94 respectively. F-statistic is significant at 1% level and its probability is low. The D. W statistic however reveals the incidence of autocorrelation in the model.

At the level of the coefficients, the results show a strong negative relationship between corruption and total employment. The result is both statistically significant and consistent theoretically. This finding implies that as

the level corruption increases in the Nigeria, the level of employment falls. The results further reveal a positive link between government capital expenditure on total employment. This outcome was too expected theoretically and is plausible with the facts on grounds. That the case in most developing economies is that government plays an indispensable role of steering the economy through its spending in the economy. This explains why there is the spate of wide fiscal dominance in these economies.

However, the coefficient of tertiary enrolment did not have the expected sign, perhaps due to the anticipated adverse effect of corruption on tertiary enrolment. The error correction variable, ECM_4, has the expected sign and is significant statistically at 1% level. The coefficient's value suggests that 32% of the shock will be eroded in every subsequent year. Thus there is a fast adjustment process from the previous year's shock.

5.0 Conclusions and Recommendations

The primary objective of this study is to critically assess the impact of corruption on economic growth in Nigeria from 1986 to 2007. To achieve this broad goal, the core channels through which corruption affects growth were identified in both the literature and empirical studies. These channels include government capital expenditure, human capital development and total employment. A Barro-type endogenous growth model was used to estimate the relationship. First, our results show that corruption has significant negative effect on economic growth. The study also found that corruption exerts negative impact on both human capital development and total employment, but it positively impacts on government capital expenditure. The positive effect of corruption on capital expenditure is, however, not surprising because public expenditure figure will always be inflated with the intention of siphoning or embezzling a reasonable proportion of the total value; see Mauro (1997) and Tanzi and Davoodi (1997). In fact our results reveal that as much as 20 percent of the entire capital expenditure may end up private pockets. Summing up, the paper discovers that corruption exerts both direct and indirect negative effects economic growth in Nigeria.

To reverse this, the paper recommends that the government should intensify its efforts at re-orientating the society against ills of corruption by establishing high ethical standards to which all and sundry must adhere. More stringent measures should be put in place to reduce the possibility of diverting public funds into private pockets. For instance, independent auditing and consulting firms can be involved to critically examine the records and projects being carried out by the government officials to ascertain whether they are executed as planned. Finally, government should increase its political will to eradicate corruption in the system. Present efforts already yielding good results should be strengthened and expanded in scope. The Economic and Financial Crime Commission (EFCC), for instance should be given more legal backing, manpower and financial resources to improve its performance now and in the future.

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