



Application of Inverted ‘U’ Hypothesis on Democratization and Level of Corruption in Sub-Saharan Africa

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Abstract

This study try to determine the effect of inverted ‘U’ hypothesis on the level of corruption in Sub Sahara Africa. The period under review was 1995-2016, using panel data, the Dynamic Two-Step System, Generalised Method of Moment (GMM) was applied to determine the impact of the explanatory variables on the dependent variable. From the results, the coefficient of duration of democracy and transparency were significant while those of other variables were insignificant in affecting the level of corruption. This study also reveals that oil producing nations are less corrupt than non-oil producing nations. It was recommended that democratic system should be consolidated and strengthened through improving and standardizing the democratic process by adopting modern electoral gadgets as this will encourage the conduct of a free and fair elections and indeed lead to the presence of inverted ‘U’ effect in the region. Also, other institutions upon which democratization depends such as judicial system, financial and other related agencies and so on should be made to function effectively as these will help to promote and sustain quality democratic system and as a result, curb corruption and further enable the existence of inverted ‘U’ effect in the region.

Keywords: Corruption, Democratization, Inverted ‘U’, Sub-Saharan Africa

1. Introduction

Corruption is almost becoming a way of life to many public office holders particularly in continents and countries where stringent penalties are not accorded to corrupt convicted personalities as a result of poor application of the principle of rule of law, institutional weaknesses and also poor governance to such an extent that the growing generation is becoming attracted and willing to emulate the corrupt actions of the people they considered role models as they are been celebrated and honoured in their respective communities with traditional titles. This assertion is confirmed with the submission of Attahiru, Mohammed, Sa’adu, Oluwole and Chikezie, (2022) that Sub-Sahara Africa has been largely looted by political office holders who majorly come to power through democratic process, by considering it as an avenue to legitimately gain public office and utilize such opportunity to loot public resources at will. Corruption becomes widespread and indeed pervasive in Sub Saharan Africa to an extent in which political elites seek election into an office in order to legitimize access towards looting public resources. Governments across the region must acknowledge the fact that this menace is mainly associated with the presence of weak institutions, high level of poverty, long period of undesired administrations, absence of



transparency in administration and the lack of implementation of suitable policies geared towards addressing the above highlighted factors which will help in curbing corruption in the region (Attahiru *et al*, 2022).

Election is an avenue for the selection of representatives with outstanding character and ability to perform excellently in a well enlightened society through an enriched democratic process and also avenue to flush out corrupt representatives. Elected office holders who embezzle public resources are likely to face electoral challenges and subsequently loss election (Eric, Chang, Golden & Hill, 2007). However, these is only possible in a democratic setting where rule of law, functional institutions and above all voter education and awareness prevails, as these will make any intending transition a reality.

The impression the western world has against Africa and indeed Sub Saharan Africa by labelling the region as the most corrupt region due to the pronounced and regular looting of public resources and deposited to foreign bank accounts is no longer a mere assumption but a reality of it highest order as this is reaffirmed by Attahiru *et al*. (2022), Sub Sahara Africa is recognised as the most corrupt region across the globe. International's Corruption Perception Index (2017) submitted accordingly, Somalia was ranked 1st in terms of corruption, South Sudan 2nd, Sudan 6th, Guinea Bissau 8th, Equatorial Guinea 9th, Angola 14th, Eretria 15th, Chad 16th while Democratic Republic of Congo 18th and Congo 19th, scoring 9, 12, 16, 17, 17, 19, 20, 20, 21, 21 and 22 percentages respectively, the countries listed above were amongst the twenty most corrupt countries across the globe. This basically reveals the magnitude of corrupt practices associated with public office holders in the region.

The pronounced extent and magnitude of corruption in the region and it consequence on the region's economic, social and political prosperity was the major reason that prompted this study. Global recognised legitimate medium for administration transition of public offices is through electoral process and scholars like Montilola and Jackson (2002) confirmed that dictatorship regimes have lower levels of corruption than democratic regimes while Drury, Kriechnaus and Lusztig, (2006) opines that democratic regimes do not have impact on corruption and Rock (2009) as in Sridharan (2014) opines that the relationship between democracy and corruption is synonymous to 'inverted U', meaning that corruption rises after democratization and therefore falls as democratic administration is strengthened. Arising from the above therefore, a null hypothesis "democratization does not have significant effect on the level of corruption in Sub Saharan Africa as against the alternative hypothesis" was developed" and this gave birth to an objective of determining the effect of inverted 'U' hypothesis (which shows that in the early stages of democratization, corruption tends to increase and decline as democracy matures) on democracy and corruption in Sub Sahara Africa as the outcome of this finding provides a useful information with respect to the status of inverted 'U' effect in the region and has provided possible reasons why the practice of democratization in Sub Sahara African and perhaps the more democratic administration, the higher the level of corruption as against the assumption of inverted 'U' hypothesis. The findings could further help future



researchers to deduced the status of inverted 'U' as well as politicians, government and policy makers so as to design policies that could further enhance and strengthen the existing institutions in the region to enable the assumption of inverted 'U' hypothesis effect holds in Sub Sahara African region.

2. Literature Review

Empirical Review

A study was conducted by Saha and Campbell (2007) to determine the effect of democracy on corruption and reported that an effective democratic system can reduce corruption, in an atmosphere that provides opportunity for those who are corrupt to be apprehended. A matured democracy is beyond just a democratically elected government. It involves absolute functioning institutions such as, judiciary system, law enforcement agencies like the police force and press freedom. Similarly, Kubbe and Engelbert (2017) study on corruption and the influence of democracy, reported that there is no specific and generalised solution for curtailing corruption, certainly there are some institutions and elements in democratized countries that support anti-corruption struggle such as anti-corruption agencies, effective judiciary system and absolute press freedom among others. Rock (2009) as in Sridharan (2014) reported that the relationship between democracy and corruption is synonymous to inverted 'U'.

Matured democracies exhibit lesser corruption level than other regimes like dictatorship/ authoritarian regimes or infant democracies (Mohtadi & Roe 2003; Triesman 2002). Moreover, Triesman (2000) reported that the duration (period) of democratic regimes, implying the period of uninterrupted years in which a country is practicing democracy, reduces corruption. In similar development, Blake and Martin (2006) reported that democratic administration need to be in practice for a long period, at least about 20 years for the perception of corruption to decline and this behavioural change manifested due to corruption's negative influence on growth damages legitimacy in a democracy administrations.

Theoretical Framework

Corruption arises from individual's thoughts, decisions and actions. Principal-agent theory believes that the interests of principal and agent are in contrast, the theory opines that there is informational asymmetry to the benefit of the agent. According to the theory the principal can prescribe the pay-off rules in their engagement. Moreover, a very unique and significant characteristic of this theory is that decisions are seen to be trade-offs between different kinds of costs (bonding and monitoring costs, and also residual loss). The principal agent theory was adopted in this study since it explains the association involving outlined electoral regulations and rules with corrupt acts among political representatives and other public personnel (Persson, Tabellini & Trebbi, 2003): Political representative are considered as agent and electorates are recognised as the principal. As a result of the asymmetry of information in the relationship between principal and agent, political representatives as well as politicians in general, have the avenue to exploit through extraction of rents, mean for their personal consumption or to make payments for



expensive campaigns activities. Certainly, the possibility for a corrupt political representative to contest and be re-elected is less than that of a sincere representative. As a result, political representatives are confronted with a trade-off, either rent seeking or behaving incorrupt and sincere to the electorates to steel re-elected.

3. Methodology

Data and Sources

This research implore secondary data on the level of corruption, poverty level, democratic durations of member countries within the region, etc. and data were collected from reliable sources, International Corruption Perception Index (annual publication on the level of corruption of member countries within the region), World Development Indicators (Poverty level, Unemployment rate, adult literacy rate, RGDP per capita and inequality) and ethnic fractionalisation index (Alesina Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003). Poverty level was based on the proportion of people living below \$1.9 daily within Sub Saharan African region and unemployment rate was based on the annual unemployment rate of every country within the region, GDP per capital was based on constant prices and inequality was based on annual Gini coefficient for the region while adult literacy rate was based on annual adult literacy rate for the region. Variety of Democracy Database for (Democracy Dummy) Meanwhile, transparency index for government policies was used for transparency. Similarly, (ethnic fractionalisation index) was used to proxy ethnicity, Heritage Economic Freedom index (annual Economic Freedom Index) .The period under review was 1995-2016, using panel data to enable more ground to analyse the data.

Estimation Procedure

Inferential and descriptive statistical analysis was adopted in order to achieve its objectives. The inferential analysis involves the use of regression statistics to establish the influence of the explanatory variables on the dependent variable. The descriptive statistics involves using tables to present some summaries and pattern of the data collected. This was achieved with the aid of summary statistics.

Generalized Method of Moment (GMM) was applied to the dynamic panel model specified in table 2 below (Dynamic Panel Two-Step model). The decision to use these techniques emanated from the fact that the countries to pooled together in this sample have some individual differences, making them heterogeneous which will violate the assumption upon which the pooled ordinary least squares regression is built. Also, specifying a dynamic relationship will introduce endogeneity problem in the model which the fixed and random effects models cannot address. This problem can appropriately be addressed in the GMM system framework. The use of a Generalized Method of Moments (GMM) system to run the regression equation in this work was considered appropriate because it also considered the problems of missing variables, serially correlated variable and endogeneity issues. (Flannery and Hankins, 2013. Morealso, Arellano and Bover (1995), Blundell, and Bond (1998) argued, the first differencing method of Arellano and Bond (1991) does not give enough information about the first differenced variable, especially if they were serially



correlated. Therefore, in addition to first differencing of the repressors, lagged first differences should also be used as instruments in a levels equation.

Model Specification

$$CPI_{i,t} = \beta_0 + \beta_1 PR_{i,t} + \beta_2 \log(RGDP)_{i,t} + \beta_3 GINI_{i,t} + \beta_4 UNEM_{i,t} + \beta_5 ALR_{i,t} + \beta_6 EF_{i,t} + \varepsilon_{i,t} \dots 1$$

Saha (2008) model was adopted. The above model is re-modified by re-defining the Political Right (PR) as Democracy Dummy (D Dummy) and by including CPTit, TRS, PVT and ETI as control variable. Thus, to determine the effect of inverted 'U' hypothesis on democracy and corruption, the regression model is specified as:

$$CPI_{it} = \beta_0 + \beta_1 CPI_{it-1} + \beta_2 DDummy_{it} + \beta_3 TRS_{it} + \beta_4 PVT_{it} + \beta_5 ETF_{it} + \beta_6 OILDUM_{it} + \beta_7 \log GDP_{it} + \beta_8 GINI_{it} + \beta_9 UNEM_{it} + \beta_{10} ALR_{it} + \beta_{11} EF_{it} + \beta_{12} IDE + \mu_{it} \dots 2$$

$$U_{it} = C_i + V_{it} \dots 3$$

Where C_i = Stand for individual country effect, V_{it} = Normal Gauss-Markov error term, CPI(-1) = Corruption Perception Index, IDE = Index of democracy, TRS = Transparency (transparency of government policies), PVT = Poverty (proportion of population living below \$1.9 per day), OILDUM = Oil dummy variable (crude) have been allotted the value of 1 for countries producing oil and 0 was allotted for countries not producing oil, ETF = Ethnic Fractionalization, DDUM = Dummy variables that takes the value of 1 during democratic rule and 0 otherwise, EFI = Economic Freedom Index, β_0 is the constant parameter or intercept, $\beta_1 - \beta_{11}$ are the slope parameters for the corresponding variables. Note: CPI was transformed to its inverse to reflect higher value for higher corruption and vice versa.

4. Results

The descriptive analysis presented in the form of summary statistics and correlation analysis in order to first, describe the data regarding their average values and standard deviation, minimum and maximum values for overall, between and within, and second, detect if employing these variables will not lead to problematic multicollinearity in the models. Moreover, the summary statistics of corruption perception index, transparency, poverty, ethnic fractionalization, log of RGDP per capita, Gini coefficient (used to proxy inequality), unemployment rate, adult literacy rate and economic freedom were presented and mean values represents the average behaviour of each variable over the countries and time periods. The three values of standard deviation indicate how each of the variable are spread is each of the variable from its respective overall mean (overall), from its mean among cross-section (between), and from its mean within cross-section (within). Minimum and maximum were also three values which shows the lowest and highest values of each variables for overall, over the selected countries and within each cross-sections respectively.



Table1: Summary Statistics of Variables

Variables	Samples	Mean Coefficient	Standard Deviation.	Minimum	Maximum
Corruption Index	Overall	-0.5	0.21	-1	-0.12
	Between		0.07	-0.6	-0.29
	Within		0.2	-0.8	-0.04
Democracy index	Overall	4.55	1.77	1.26	8.28
	Between		1.76	1.57	8.08
	Within		0.34	3.13	5.74
Transparency	Overall	0.7	1.11	-2	3.21
	Between		1.08	-1.8	2.44
	Within		0.39	-1.1	2.55
Poverty	Overall	42.8	21.6	0.37	94.1
	Between		21.7	0.47	83.4
	Within		5.22	27.1	65.3
Ethnic fract.	Overall	0.67	0.22	0	0.93
	Between		0.24	0	0.93
	Within		0	0.67	0.67
GDP per cap (2010 base year)	Overall	2256	3210	194	20334
	Between		3385	230	16792
	Within		576	2507	5798
Gini	Overall	45.2	8.04	29.8	65.8
	Between		7.55	31.6	62.7
	Within		2.07	35.5	62.3
Unemployment	Overall	9.93	7.81	0.74	37.6
	Between		7.83	1.01	29.7
	Within		1.55	2.64	23.2
Adult literacy	Overall	64.7	19.6	15.5	95.3
	Between		20.4	20.8	94
	Within		3.74	53.1	76.8
Economic Freedom	Overall	54.53	8.13	21.4	77
	Between		7.27	36.0	70.8
	Within		3.05	39.3	67.2

Source: Author's Computation, 2022.

An estimation result of the regression model which includes the squared term of index of democracy is presented here to show the quadratic effect of duration of democracy on corruption index. This was carried out to verify the hypothesis that are at the early stage of democracy, corruption initially increases, while at full democratic maturity, corruption reduces (inverted-U effect hypothesis). The result shows that oil dummy is having significant but negative coefficient and log of GDP and adult literacy are still having their significant positive coefficients. However, both coefficients for the duration of democracy and its squared term are not statistically significant. This indicates that there is no evidence of a quadratic effect of duration of democratic index on corruption index. Therefore, the hypothesis that corruption initially increases at early stage of democracy and declines when democracy matures, does not hold for Sub-Sahara African countries. This could be as a result of the ineffective functioning of the institutions that form and supports democracy such as the judiciary, economic and other anti- corruption agencies including the political institution itself that determines the quality of the electoral process, other security agencies and so on. Consolidating these institutions would go a long way in curbing corruption.



Table 2: Test of Inverted U-Effect Hypothesis on Democracy and Level of Corruption in Sub Saharan Africa (Sensitivity Analysis)

VARIABLES	Coefficient	p-value
CPI(-1)	0.7870*** (0.0245)	0.000
IDE	-0.0122 (0.142)	0.931
IDESQR	-0.0123 (0.0161)	0.444
TRS	-0.0030 (0.0323)	0.926
PVT	0.0001 (0.0034)	0.975
ETI	0.0303 (0.3140)	0.923
OILDUM	-0.3230** (0.1630)	0.047
RGDP per capita	0.2200** (0.110)	0.045
GINI	0.0024 (0.0045)	0.587
UNEM	-0.0091 (0.0061)	0.137
ALR	0.0049* (0.0029)	0.091
EF	0.0063 (0.0047)	0.178
Constant	-1.5410 (0.9570)	0.107
Number of countries	40	
Wald Chi-squared	1710.63***	

Source: Author's Computation, 2022.

Note: CPI is corruption index; IDE is index of democracy, DDummy is democratic dummy; TRS is transparency; PVT is poverty; ETI is ethnic fractionalisation; OILDUM is oil dummy; UNEM denotes unemployment; ALR denotes adult literacy rate; and EF denotes economic freedom.

5. Conclusion and Recommendations

Arising from the above therefore, it could be concluded that inverted 'U' hypothesis effect do not hold in Sub Saharan Africa, which implies that democratic regimes have higher levels of corruption than non- democratic regimes and the reason for such finding will be attributed to the fact that in Sub Saharan Africa the institutions upon which democratization depends such as the electoral process, financial and other related offence agencies, judicial system are not consolidated and strengthened to function effectively and as a result, cannot effectively curb corrupt practices by public office holders. Hence the



null hypothesis could not hold and as such was rejected and the alternative hypothesis was established and therefore accepted. Although the above finding is in conformity with the findings of Montinola and Jackman (2002) which states that, political corruption is however lower in non- democratic regimes than in partially democratic states or countries. But once past a threshold, democratic institutions meant to support democratic system enhance corruption and contradicted the findings of Engelbert (2017) who found that better levels, quality and longer years of practicing democracy are connected with lower level of corruption. This study finds that inverted ‘U’ effect does not hold in Sub Sahara Africa which is in contrast to the findings of Drury et al, (2006) who reported that democracy does not have any impact on the level of corruption.

Democratic system should be consolidated and strengthened through improving and standardizing the democratic process by adopting modern electoral gadgets as this will encourage the conduct of a free and fair election and indeed leads to the presence of inverted ‘U’ effect in region. Adequate sensitization and voter education program should be encouraged so as to enable electorates in the region vote the candidates of their choice based on credibility and nothing but credibility. This will help to flush out corrupt representatives and perhaps promote and improve the democratic standard and indeed reduce the level of corruption and pave way for inverted ‘U’ effect on democratization and corruption to strive. Other institutions upon which democratization depends such as judicial system, financial and other related agencies and so on should be made to function effectively through consolidation as these will help to promote and sustain quality democratic system and as a result, curb corruption and further enable the existence of inverted ‘U’ effect in the region.

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