

## **Governance, Public Expenditure, Trade and Poverty Reduction in Sub-Saharan African Countries**

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### **Abstract**

When policies and programmes are designed and implemented successfully by governments, it tends to improve development indices such as reducing poverty, when governance is good. The paper examined the impact of governance, public expenditure and trade on poverty reduction in some selected Sub-Saharan African countries, using Pool Mean Group (PMG) with data spanned for 24 years (1996-2019). The results show a long-run association between governance, public expenditure, trade and poverty reduction in SSA. Also, control of corruption, political stability, government expenditure, and trade reduces poverty by enhancing the Human Development Index (HDI) in the long run. This outcome implies that improving governance (control of corruption and political stability) is vital for reducing poverty as it increases the adequate performance of public expenditure and as well as promote trade in SSA.

**Keywords:** governance; public expenditure; trade and poverty reduction.

**JEL Classification:** K02, H50, F10, O11

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### **INTRODUCTION**

Globally, governance is one of the critical tools for every economy's performance towards achieving developmental goals- poverty reduction, hence attracting the attention of researchers, policymakers and even international financial institutions and organizations (such as the World Bank, IMF and even NGOs). When governance is bad, it inflicts some consequences on the people-unemployment, low government expenditure, poor infrastructure, low economic growth, increased poverty, and vice versa when it is good. Different reports by either World Bank, United Nations (UN) and Transparency International (TI) show that the majority of Sub-Saharan African countries with the problem of poverty are mostly corrupt and unstable. There is, therefore, a strong indication that governance has a long-run relationship with public expenditure and poverty in Sub-Saharan Africa, hence the need for empirical investigation to affirm or otherwise this relationship.

Governance refers to the effectiveness of institutions and a stable political system needed by every economy to enable it to utilize the naturally endowed resources for achieving economic growth and development. (World Bank, 1994). With good governance, policies and programmes introduced by governments tend to improve development indices like reducing poverty (Dankumo, Ishak, Bani, & Hamza, 2019). However, when policymakers' selfish interest outweighs the communal own, policy impact used to be worse-off and detrimental, only enriching the few in authority at the expense of the poor (Schaffner 2014). To Kaufmann, Kraay and Zoido-Lobaton (1999), governance are "the traditions and institutions by which authority in a country is exercised. It is also the government's level of accountability and the efficacy of its public institutions' management regarding transparency with a functional legal framework for achieving both social and economic aspect of development by ensuring justice and respect of peoples' rights and freedoms (UNESCO 2006). The agreement has been that there exists a positive relationship between good governance and economic growth, but a negative one between bad governance and economic growth. The economic performance of a country is a function of its nature of governance (Levchenko 2007) as it provides a sine-qua-non for effective performance by drawing the trails towards economic growth and development. Governance is, therefore, not just only desirable, but rather a pre-condition for achieving developmental goals. Because it enhances market system efficiency and as well as reduce market failures to ensure equity in resource-distribution (Khan 2007). Governance is responsible for differentiating between successful and unsuccessful countries (Galliano and Orozco 2013).

In this paper, we used control of corruption and political stability to proxy governance as proposed by the World Bank (Kaufmann, Kraay, & Mastruzzi 2008) and used by (d'Agostino, Dunne & Pieroni 2016; Habibullah, Badariah & Hamid 2016; Sulemana & Kpienbaareh 2018). The justification for using corruption and political instability is that they are the two significant aspects of governance that bedevilled the Sub Saharan African (SSA) countries.

Corruption is the process of influencing government policies and decisions for one's benefit (Shleifer & Vishny, 1993). To the World Bank and Transparency International (TI), it is an abuse of entrusted power classified based on the amount lost and the sector affected. Generally, corruption is a system of dishonesty or criminal activity undertaken by an individual or group of individuals that were entrusted with the power to lead, often for illegal gains. Some of the faces of corruption are kickbacks, bribery, tender manipulation, embezzlement and conflicts of interest (Osei-Tutu, Badu & Owusu-Manu 2010). Control of corruption is the extent to which those in power are committed to fighting corruption, without which it will continue to remain high and devastating to the economy. Hence the discussion of control of corruption estimate by the World Bank, with measures between -2.5 (most corrupt) and 2.5 (most clean).

According to the World Bank, (2020), North America has the highest value of corruption index, having recorded positive values of not less than 1.5/2.5 throughout the period under study. Europe & Central Asia is next with average positive values of 0.4/2.5 and above. Latin America & Caribbean and East Asia & Pacific regions also maintained average positive values. MENA countries are next, then the region of South Asia and Sub-Saharan Africa having the average of -

0.6062, which is the worse estimate, indicating a low level of commitments by the SSA governments in ensuring a corruption-free region, indicating it as the most corrupt region in the world. Transparency International shows that 42% of the most corrupt countries scoring less than 20, are from SSA, with Somalia and South Sudan clinching the last position out of the 179 countries of the world ranked (Transparency International 2020). Also, only three out of the 30 nations of SSA included in the governance indicators by International Country Risk Guide's (ICRG) have scored above average (Marleny 2019). Tragically, in the vast majority of the SSA countries, corruption is viewed as a deliberate method for doing everyday life activities and even incorporated in the matter of life, which is considered to be a regard for the region's customs by multinational corporations (Transparency International 2017). Hence, the argument by Sequeira (2012), that about 25% of GDP loss was explained by corruption due to rent withdrawal that exceeds the rent sharing benefit. Sulemana & Kpienbaareh (2018), also argue that high-income inequality is associated with high corruption levels in Sub-Saharan Africa. Because of the widespread of corruption in SSA, it has become customary, (Hasty 2005; Smith, 2007 and Liedong 2017) therefore making the poor people in the region to become used to it and as well tolerate it.

Political instability can be understood in three forms: as a propensity for government or regime change; as an incidence of violence or political upheaval in a society which includes demonstrations and assassinations; and lastly instability of policies. Political instability is the "propensity to observe government changes" which could either be constitutional, i.e. within the armpit of law as an election or unconstitutional, i.e. through coups and coup d'état (Alesina & Perotti 1996). Political instability is a consequence of governance failures. Political instability is one of the costs of corruption, which is a significant obstacle to democracy and the rule of law, which is a common feature of SSA. Del Monte & Papagni (2007) opines that corruption increases whenever a country experiences any change in its political or institutional structure.

Similarly, the World Bank, (2020) regional political stability (PSV) estimate, presents North America as the most stable with a higher rating, having the lowest value. Next is Europe & Central Asia region, Latin America & Caribbean, MENA countries, Sub-Saharan Africa and lastly South Asia. The unstable situation in South Asia is due to the instability experienced in Afghanistan and Pakistan throughout the period under study, whereas in SSA most of the countries are affected by one form of instability or the other. However, among the world regions, none scored more than 1.0 of political stability, which signifies how unstable (high rate of violence and terrorism) the entire world is. Political instability and other attendant violence hurt economic development, discourage capital formation, foreign investment and capital inflow, thereby affecting the economic growth (Abu, Karim & Aziz 2014).

According to the World Bank, (2020), political instability in SSA is very high with very low political stability estimates average at -0.5324 for the period under study. This estimate shows an unstable political environment and an increased level of violence/terrorism in SSA, with more than three-quarters of the nations, have experienced or are still experiencing instability in the form of civil wars, religious crises/terrorism and coups since independence.

Sub-Saharan African governance (corruption and political instability) indicators are averaged at -0.6812 and -0.5324 respectively determined by its institutional inefficiency. These values indicate a high level of corruption and political instability, hence, making state capacity and governance in Sub-Saharan Africa to be worse. Governance is one of the reasons why a few nations are getting it challenging to utilize public expenditure in lessening poverty (World Bank 2017). Sub-Saharan African countries have bad governance in the form of weak institutions, high rate of corruption, coup and coup *de tat*, insecurity, religious and ethnic crisis, civil wars, terrorist activities, high unemployment level. High levels of corruption and unstable political environment is not only affecting their growth but also making the region to be poor (World Bank 2017). Hence, the conclusion that countries experiencing corruption and political instability tend to have a high rate of extreme poverty, due to the corrupt public officers' attitudes and settlement of the crisis. It is a known fact that corruption damages economic progress and as well as cause political instability (Abu et al. 2014; Mauro 2004). Corruption, degrading institutional quality, high unemployment, the poor state of infrastructures, reduced utilization of resources, crisis and continuous wars, causes poverty in SSA (Brennan 2018; Kabuya 2018 & Mendy, 2016).

Poverty is a global phenomenon that has attracted the attention of all around the globe. United Nations, in 1995, defined poverty as a situation characterized by a severe deficiency of necessities of life, like food, health, education, shelter, safe drinking water, information and sanitation facilities. In absolute terms, the World Bank looked at extreme poverty as the inability to live on or above US\$1.90 a day. It is also said to exist in a society if people of that society do not reach a certain level of economic welfare believed to constitute a reasonable minimum standard of that society (Ravallion 2017). According to the World Bank, the consumption levels of 1.4 billion people world over was below US\$1.25 per day (World Bank 2018a), with SSA housing more than half, as the number of poor increased in the to more than the total of other regions. If this trend continues up to 2030, about 9/10 of the world poor will be in Sub-Saharan Africa (World Bank 2020). Some causes of poverty are; market failure, assets inequalities, unemployment, inflation, low government expenditures and bad governance.

The consequences of this scenario are; low life expectancy at birth is 62.5 (UNDP 2018), increased malnutrition that accounts for 54% death of children (Bain, Awah, Geraldine, Kindong, Sigal, Bernard & Tanjeko, 2013) while infant mortality rose to 52% in the region (World Bank 2020), with more than half of 5.4 million children, said to have died in 2017 are from the region (UNICEF 2018). Similarly, SSA houses 66% of the world population living with HIV/AIDS, (UNAIDS 2018), mostly infected through mothers who probably are poor or uneducated. High illiteracy rate with 34million out-of-school children, which constitutes more than half of the World total (UIS 2018). There is also high child and maternal mortality with 99% attributed to inadequate access to health services, the rich-poor gap and the poverty level bedevilling the region (WHO 2018), lack of suitable shelter and no good drinking water.

Oxfam (2017) reported an increase in the poverty trend despite abundant resources and increased public expenditure, which only increased the number of millionaires by 44% while the poor by 69%. In our opinion, we attributed the

existing inequality in the economy to a persistent increase in corruption, inconsistency in government policy and political instability. Furthermore, UNDP (2018), in its report on Human Development Indices, shows that 31 out of the 38 countries of the World with Low Human Development Index are from Sub-Saharan Africa. This is why Gates (2018), argues that, by 2050, two countries of SSA- DR Congo and Nigeria- will house more than 40% of the world poor if no serious measures are taken. Poverty is measured in terms of income that enable individual's access to the necessities of life to enhance well-being. However, in this study, we consider its reduction, which can easily be proxy by Human Development Index (HDI).

For this study, we use HDI to proxy poverty reduction, considering what it measures (i.e. healthy & long life, knowledge & decent standard of living) that captures the poverty components. The HDI index sets goalposts- minimum and maximum limits- for each dimension and then shows the position of each country in respect to the goalposts that ranges between 0 and 1. The higher the index, the better the HDI and the lower the poverty in that country (Acharya & Nuriev 2016). Poverty is reduced by the government through its expenditure according to Keynes due to market failure that was reiterated (by Sen 1999; Wilhelm & Fiestas 2005) but sometimes affected by governance- corruption and political instability. ( Del Monte & Papagni 2007; Wei, 2001).

This study investigates the impact of governance, public expenditure and trade on poverty in SSA. The novelty of this work is the use of governance (corruption and political instability) estimates concurrently with the adoption of a PMG approach, which has not been used in previous studies to the best of our knowledge. This topic is called for because governance and poverty are the two most serious issues trending globally. Therefore, the outcome of this work would generate a great deal of interest and understanding among the academicians, policymakers, international organizations and the governments of SSA countries. Also, it will suggest some measures to be taken in order to improve the quality of governance that will affect public expenditures positively on poverty reduction. For academicians, it serves as a source of reference for further research on the same topic. Whereas, policymakers and other agencies such as the UNDP, UNICEF and other NGOs with interest in reducing poverty will understand the actual impediments to poverty reduction, so they can make right decisions for tracking poverty reduction programmes.

The paper is outlined as follows: Section 1 introduces the work, section 2 review literature on governance, public expenditure and poverty nexus. Section 3 discusses the methods, data descriptions and sources. We present the results and findings in Section 4, while section 5 concludes the paper.

## **LITERATURE REVIEW**

Wei (2001), argues that corruption tilts the structure of government expenditure away from desired education and healthcare, simply because, the extraction of rents is challenging. In the same vein, Del Monte & Papagni (2001) suggests that public spending on consumable goods and services has the potentiality of causing corruption.

Chetwynd, Chetwynd & Spector (2003) concluded that corruption in itself does not cause poverty, but that it has some consequences on some economic and

governance indices, the medium through which production of poverty takes place. They maintained that corruption causes poverty through impacting on factors of economic growth, which, sequentially causes and worsen poverty. Also, that corruption affects growth via governance factors, that later affect poverty via destruction of the institutions of governance to deliver qualitative public goods; distracts public investment from the most productive to unproductive (for easy access to collecting bribes), decreases compliance to the right way of doing business and finally increase pressures on the government budget.

Timofeyev (2011), used corruption estimate of Russia to examine the link amongst corruption and social spending on poverty with a focus on how corruption affects social expenditures that ought to influence poverty. The study concludes a relationship between the efficacy of social spending and TI's corruption perception index. That unless corruption controlled, public expenditures offered cannot achieve the target which is an affirmation to study by Gupta, *et al* (2000) when they maintained that corruption reduces the impact of government expenditure on social outcomes and also affect that quality of government services provided to the people. Increase control of corruption would allow for improvement in human development by a decrease in infant mortality and improving primary school enrolment. Later, Fayissa & Nsiah (2013) attested that good governance or otherwise is responsible for the variation in the economic growth of African nations. There is, therefore, an adverse effect of corruption on growth and poverty, because it tilts public expenditure away from the desired projects that are productive to unproductive ones.

Ovat & Bassey (2014) revealed an apparent correlation amongst corruption, public spending and economic growth with an adverse effect on economic growth which is manifest in the rising incidence of poverty. The study shows that corruption is a malfunction that obstructs against excellent governance, with public use as its conductor to impede the speed of economic growth in Nigeria.

Olarewaju (2016) shows that corruption and public investment adversely affect output growth. The paper concluded that corruption tilts government expenditure away from the desired projects that are growth-enhancing towards unproductive ones.

Political instability also has a link with poverty because the more unstable a country or region is, the more the number of poor, similarly, the higher the number of poor, the more unstable will be the country (Alesina & Perotti 1996; Del Monte & Papagni 2007; Ibrahim & Cheri 2013; and Omoteso 2014). However, Dankumo, Ishak, Oluwaseyi & Onisanwa (2019) did not find any significant effect of political instability on growth, after investigating how it affects economic growth in Nigeria.

Aisen & Francisco (2011) found that when political instability is high, development paces of GDP per capita will be lower. The transmission channels for these effects was to be through adverse effects of political instability on growth by decreasing rates of productivity and to some extent, human and physical capital accumulation. They inferred that the nearness of economic freedom and ethnic equality is useful to economic development, whereas democracy has a marginally negative impact. By this, it means that political instability does positively affect poverty via the effect on growth.

Ibrahim & Cheri (2013), examined the nature of democracy, political instability and the issues of underdevelopment. They find that lack of democracy is one of the significant causes of corruption, terrorism and poverty. That unless the people practice democracy following its fundamental doctrines of transparency, justice and fairness, the people will always prefer to change the government by any means thereby aggravating underdevelopment that manifested in corruption and high poverty rate.

According to Omoteso & Mobolaji (2014) after investigating the influence of governance indices, especially control of corruption on the economic growth of 47 countries in SSA, the study discovered that political stability, together with regulatory pointers enhances growth, because they impact on growth, while that of control of corruption was not obvious.

On public expenditure-poverty nexus, there is a short-run as well as a long-run relationship between public expenditure and poverty (Mehmood & Sara 2010). Furthermore, there exists a positive and significant association between public expenditure and poverty reduction (Edrees, Azali, Azman & Nor 2016; Marisa, Hidalgo-Hidalgo & Iturbe-Ormaetxe 2018), especially expenditures on education and health facilities (Bakhtiari & Meisami 2010; Boqiang 2005; Chemingui 2007; Edeme, Nkalu & Ifelunini 2017; Fan, Hazell & Thorat 2000; Fan & Xiaobo 2008; Sasmal & Sasmal, 2016). Nevertheless, some studies find no significant relationship between public expenditure and poverty reduction (Acharya & Nuriev, 2016; Anderson, Ana, Duvendack & Esposito, 2018; Mallick 2008). In the studies on an expenditure-poverty nexus, variety of factors such as the sample used for estimation, type of control variables included in the model and the type of government spending affects the study (Anderson et al. 2018).

However, there is no doubt that governance (corruption and political instability) affects economic growth and reinforces poverty among the already emerging nations. (Gyimah-Brempong, 2002; Gyimah-Brempong & Gyimah-Brempong, 2006; Mauro, 1995; Méon & Sekkat, 2005; Tanzi, 1998).

## METHOD

### Model

This study uses the panel data regression model to investigate the long-run relationship between governance, public expenditure and poverty in the SSA. The functional relationship takes this form;

$$\text{HDI} = f(\text{CCORR}, \text{PSV}, \text{GCEXP} \text{ and } \text{TR}) \quad (1)$$

Equation (1) postulates that HDI (poverty reduction) is a function of control of corruption, political stability, public expenditure and trade. It means a change in HDI is brought about by a change in Government consumption expenditure and, governance (control of corruption and political stability). Various studies have used different proxies for poverty, but this study shall follow some recent works on poverty (by Acharya & Nuriev 2016; Edrees et al. 2016) where they all used Human Development Index to proxy poverty reduction. Since the dependent variable, poverty reduction, is a dynamic variable, it means its lagged value would be included as one of the regressors. The model specification for this objective shall, therefore, take this form below;

$$HDI_{it} = \beta_0 + \beta_1 HDI_{it-1} + \beta_2 CCORR_{it} + \beta_3 PSV_{it} + \beta_4 GCEXP_{it} + \beta_5 TR_{it} + u_{it} \quad (2)$$

The above equation (4) can thus be transformed into a log-regression function as given below:

$$\ln HDI_{it} = \beta_0 + \beta_1 \ln HDI_{it-1} + \beta_2 CCORR_{it} + \beta_3 PSV_{it} + \beta_4 \ln GCEXP_{it} + \beta_5 \ln TR_{it} + u_{it} \quad (3)$$

Some of the variables were transformed into logarithm form, because they have large values, while CCORR and PSV were not because they are index numbers, which cannot be logged. The study uses lnHDI as a proxy for poverty reduction, CCORR is the control of corruption estimate for corruption; PSV the political stability and absence of violence for political instability; lnGEXP is the government consumption expenditure, and lnTR is trade.  $\beta_0$  is the constant term, While  $u_{it}$  is the error term containing country and time-specific fixed effects, given by:  $u_{it} = \mu_i + \varepsilon_t + v_{it}$ , With  $v_{it}$  assuming to be independent and distributed identically with zero mean and variance  $\sigma^2 v$ .  $i$  denotes a country ( $i = 1 \dots N$ ) and  $t$  denotes the period ( $t=1 \dots, T$ ). While  $\beta_1, \beta_2, \beta_3, \beta_4$ , and  $\beta_5$ , are the coefficients of the explanatory variables to be estimated. The expected signs of these coefficients are that;  $\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  should be  $> 0$ , i.e. positive coefficient. The implication is that the increase in these explanatory variables would mean improvement in HDI (poverty reduction); in other words, the variables are all negatively related to poverty.

We can use the residuals of the long-run model of equation (3) to have the ECM as given below:

$$\Delta Y_{it} = \varphi_0 + \sum_{i=1}^{n-1} \varphi_{1it} \Delta Y_{i,t-1} + \sum_{i=1}^{n-1} \varphi_{2it} \Delta X_{i,t-1} + \theta ECT_{it-1} + \mu_i + \varepsilon_{it} \quad (4)$$

Where the error correction term,  $ECT_{it-1}$ , represents the long-run model residuals in the equations (2) and (3) lagged by one period (t-1). It is defined below as:

$$ECT_{it-1} = \mu_{it-1} = Y_{it-1} - [\gamma_0 + \gamma_1 X_{1it} + \gamma_2 X_{2it} + \gamma_n X_{nit}] \delta \quad (5)$$

The error correction parameter  $\delta$ , indicates the speed of adjustment, such that when  $\delta = 0$ , it is evidence of no long-run association between the variables also that the parameter should carry a negative sign and as well as significant to be able to show evidence of convergence of the variables to long-run equilibrium.

In the case of the long-run homogeneity, the parameters are identical across countries given as  $\theta_i = -\gamma_i / \varphi_i$ , namely  $\theta_i$  and  $\theta_n$ ,  $i = 1, 2, \dots N$ . The study utilizes maximum likelihood estimation in computing both the country-specific short-run parameters and the common long-run coefficients.

### Estimation Technique

First, the study conducted panel unit-root tests, using the tool for detecting non-stationarity of the data developed by Levin, Lin & Chu (2002), Im, Pesaran &



Shin (2003) and Madalla & Wu, (1999)'s Augmented Dickey-Fuller (ADF). Furthermore, we do a panel cointegration test using Pedroni, (1999;2000;2004) residual cointegration test, to ascertain if a long-run link exists between the variables in SSA. The presence of the cointegration permitted the study to go ahead to estimate the long-run and short-run coefficients parameters together with the ECM using the Mean Group(MG), Pooled Mean Group (PMG) and Dynamic Fixed Effect (DFE) estimators. A Hausman test was carried out to ascertain whether the hypothesis of slope homogeneity (i.e. there is no difference in the estimated coefficients) is rejected. The Hausman's test outcome (0.5579) failed to reject the null hypothesis, since it is greater than 0.05, meaning PMG estimator is appropriate while its estimates are consistent and efficient.

### **Data and Sources**

Our panel comprises of 27 countries of SSA. The study restricted itself to these countries because of data unavailability for some of the countries. The period of study spanned over 24 years (1996-2019), the choice of this period was because the Worldwide Governance Indicators (WGI) where we obtained governance (corruption and political) indicators from World Bank starts from 1996.

The variables used are: poverty reduction, proxy by Human Development Index (HDI) with a score between 0 and 1, public expenditure is government consumption expenditures as a percentage of GDP, governance (control of corruption and political stability) with a range from approximately -2.5 to 2.5 and trade as a percentage of GDP. Data on HDI, government expenditure and trade, are all sourced from World Development Indicators (WDI), while that on governance is from the Worldwide Governance Indicators (WGI), all of the World Bank Group database.

## **RESULTS AND DISCUSSION**

The empirical results are in five different steps; (i) report on the descriptive statistics and correlations (ii) the unit root tests of the variables (iii) cointegration test using the residual-based panel tests developed by Pedroni (1999) at the same time allowing for both the fixed and time effects. (iv) Using the MG, PMG and DFE estimators to examine the relationship.

### **Descriptive Statistics and Correlation matrix**

Table 1 presents how the data set is spread, and Table 2 the correlation amongst the variables. Looking at the minimum and maximum values of HDI and the other independent variables, we are justified to use panel data to estimate the relationship that allows for variation in the short-run while restricting that of the long-run coefficients. For instance, the HDI minimum and maximum values are 0.235 and 0.804, respectively, with a standard deviation of 0.11, indicating an enormous difference across countries in HDI. However, the mean value of the HDI (0.476) has confirmed that SSA has low HDI, i.e. high poverty rate. Since the higher the index, the better the HDI and the lower the poverty (a score below 0.550 = low human development = high poverty) (UNDP 2020). The other independent variables exhibit the same pattern. The correlation between poverty (HDI) and the independent variables is also sensible enough to permit for a robust

estimation of the relationship between poverty (HDI), governance (corruption and political instability), public expenditure and trade, using MG, PMG and DFE.

Table 1 Descriptive statistics of the variables over the period 1996-2019

<b>Variables</b>	<b>Observations</b>	<b>Mean</b>	<b>Std.Dev</b>	<b>Maximum</b>	<b>Minimum</b>
HDI	648	0.476	0.111	0.804	0.235
CCORR	648	-0.610	-0.584	1.217	-1.722
PSV	648	-0.548	-0.904	1.118	-2.495
GCEXP	648	15.199	6.153	40.444	2.047
TR	648	70.592	32.382	209.874	16.669

Table 2 Pairwise correlation matrix of variables over the period 1996-2019

<b>Variables</b>	<b>HDI</b>	<b>CCORR</b>	<b>PSV</b>	<b>GCEXP</b>	<b>TRO</b>
HDI	1.000	-	-	-	-
CCORR	0.470	1.000	-	-	-
PSV	0.469	0.685	1.000	-	-
GCEXP	0.105	0.355	0.246	1.000	-
TR	0.394	0.292	0.403	0.484	1.000

### Unit Roots tests

In panel unit root cointegration, all the 27 countries are pooled together with the size and direction of the parameters unrestricted to be equal across countries. We test for the non-stationary null hypothesis against the stationary alternate hypothesis using the LLC, IPS and ADF statistic for an individual country. The top three rows in Table 3 report the non-stationarity test result on HDI, ccorr, psv, gcexp and tro at levels with and without trend, at the same time with and without controlling for the time fixed effects using a Schwarz Info Criterion (SIC), to automatically select up to four lags maximum for ADF tests. The majority of the results reject the null hypothesis of non-stationarity. The last fourth, fifth and sixth rows of Table 3 carries the results in first differences, where all the specifications reject non-stationarity at 1% level, which means that the variables are both I(0) and I(1) at either constant, constant with the trend or even both. With this result, we are justified to proceed to test hdi, ccorr, psv, gcexp and tro for cointegration to investigate a long-run relationship in the econometric model.

Table 3 Unit root test result

	LLC		IPS		ADF	
	No trend	Trend	No trend	Trend	No Trend	Trend
	<b>LEVEL I(0)</b>					
<b>HDI</b>	-3.68***	-3.26***	-0.50	-2.45	54.73	89.14***
<b>CCORR</b>	-3.27***	-0.44	-1.96***	-2.51**	92.10***	80.37***
<b>PSV</b>	-3.10***	-2.53***	-1.91**	-2.36	79.33***	71.53**
<b>GCEXP</b>	-3.36***	-4.29***	-2.09***	-2.67	93.68***	89.72***
<b>TR</b>	-1.97**	-1.61**	-1.72	-3.09***	65.21	93.22***
	<b>FIRST DIFFERENCE I(1)</b>					
<b>HDI</b>	-8.63***	-	-2.92***	-	163.20***	-
<b>CCORR</b>	-14.01***	-	-4.02***	-	273.31***	-
<b>PSV</b>	-17.84***	-	-4.74***	-	331.44***	-
<b>GCEXP</b>	-19.82***	-	-4.43***	-	356.23***	-
<b>TR</b>	-17.64***	-	-4.26***	-	317.26***	-

Notes: \*\*\*, \*\* and \* denote 1%, 5% and 10% significance level respectively. Maximum lags of 3 on the Schwarz Information Criterion (SIC).

### Lag Length Selection

Table 4 below present the result of lag selection criteria which favoured model 2, that is ARDL (1,1,1,1) model, because the value of AIC and BIC for that model is the lowest among the AIC and BIC values of other models 1,3, and 4.

Table 4 Lag length selection results

Model	ARDL	AIC	BIC
1	1,0,0,0	-3136.776	-3111.027
2*	1,1,1,1*	-3137.235*	-3111.485*
3	1,3,1,1,1	-2013.384	-1988.266
4	1,2,1,1,1	-2454.733	-2429.292

### Panel Cointegration Tests

Table 5 shows the result of Pedroni panel cointegration test between poverty (HDI), control of corruption, political stability, government expenditure and trade. The test used a total of seven group tests, i.e., within and between groups to test if the variables are cointegrated. In table 5, model 1b is the accepted model, i.e., with the trend, since 5 out of the seven statistics are significant at 1%, especially the *pp* and *adf* panel and group statistics of the within and between dimensions respectively. We can, therefore, conclude the existence of a long-run relationship between poverty and its explanatory variables; governance (ccorr, psv), public expenditure and trade.

The existence of a long-run association between poverty and its determinants in SSA is meaningful, economically, which suggests that these countries have the potentials of reducing poverty at long-run. Having found this cointegration link, we then go further to estimate the coefficients of these

variables using MG, PMG and DFE, after which we choose the best out of the three. The essence is to determine which of the independent variable is more important in explaining the dependent variable.

Table 5 Results of Pedroni Panel Cointegration Test (with *lhdi* as the dependent variable)

	<b>Model 1: Without Trend</b>	<b>Model 1b: With Trend</b>
<b>Within Dimension</b>		
<b>Panel v-stat</b>	-4.196	14.403***
<b>Panel rho-stat</b>	4.169	2.234
<b>Panel pp-stat</b>	2.916	-5.574***
<b>Panel adf-stat</b>	2.641	-5.708***
<b>Between Dimension</b>		
<b>Group rho-stat</b>	5.284	4.523
<b>Group pp-stat</b>	1.114	-6.635***
<b>Group adf-stat</b>	0.064	-3.773***

Notes: \*\*\* and \*\* denote 1% and 5% significance level, respectively. Maximum lags of 3 on the Schwarz Information Criterion (SIC).

### Panel Estimation results

Table 6 reports the estimation of the long-run and the short-run coefficients of the poverty reduction (HDI) relationship with corruption, political instability, government expenditure and trade, together with the convergence parameter (ECM) that indicate a tendency to adjust from short-run to long-run.

However, based on the Hausman test result on the last row shows a chi-square value of 5.59 ( $< 10$ ) and the p-value is 0.2324 which is  $> 0.05$ , we are authorized to fail to reject the null hypothesis of valid long-run homogeneity slope. Hence, the PMG estimation is more efficient and appropriate for the governance, public expenditure, trade and poverty investigation in SSA, reporting the PMG result. Firstly, the sign of the adjustment coefficient (-0.312) is as expected and as well as significant at 1% level. Moreover, the adjustment coefficient value means that all the variables can adjust to long-run equilibrium from short-run at a speed of 31%, meaning it will take 3 years 2 months for poverty reduction to adjust back to the long-run state, should there be any distortion. However, the speed of adjustment among the variables under study is weak in the region, which may be attributed to bad governance, weak institutions and bad policies.

Table 6. Empirical Results of pooled estimates for ARDL (1,1,1,1) poverty (hdi), governance (corruption and political instability) public expenditure and trade. Dependent variable: lhdi

	<b>MG</b>	<b>PMG</b>	<b>DFE</b>
<b>Adjustment coefficients</b> (Dependent variable: <i>lhdi</i> )	-0.086*** (0.026)	-0.312*** (0.018)	-0.035*** (0.006)
<b>Long-run coefficients</b>			
<b>ccorr</b>	0.455 (0.399)	0.364*** (0.031)	-0.368** (0.163)
<b>psv</b>	0.172 (0.893)	0.083*** (0.002)	0.116* (0.067)
<b>lgcexp</b>	-1.089 (0.931)	0.007*** (0.018)	-0.096 (0.094)
<b>ltr</b>	0.636 (0.512)	0.191*** (0.033)	0.211 (0.128)
<b>Short-run coefficients</b>			
<b>ccorr</b>	0.001 (0.007)	0.029** (0.007)	0.014*** (0.005)
<b>psv</b>	-0.006* (0.003)	-0.000 (0.003)	0.003 (0.002)
<b>lgcexp</b>	-0.000 (0.005)	0.006 (0.050)	0.009*** (0.00)
<b>ltr</b>	-0.000 (0.007)	0.000 (0.005)	0.006 (0.005)
<b>No. of parameters</b>	8	8	8
<b>No. of countries</b>	27	27	27
<b>No. of observations</b>		540	
<b>Log-Likelihood</b>	-	1896.828	-
<b>Hausman test for long-run homogeneity.</b>		3.00 (0.5579)	

Notes: all equations included a country-specific term, figures in parenthesis are standard errors except for the Hausman test, which is the p-value. \*, \*\* and \*\*\* indicate 10%, 5% and 1% level of significance, respectively.

The coefficient of control of corruption (0.364), is positively and significantly related to HDI, which means an improvement in control of corruption (perceived fall in corruption) would increase HDI (decrease poverty) in SSA countries. This result is in tandem with the studies (see Dankumo et al. 2019; Gyimah-Brempong 2002; Méon & Sekkat 2005; Shleifer & Vishny 1993; Treisman, 2000), that suggests corruption hurts growth and poverty. It also indicates that 1 unit improvement in control of corruption will increase HDI by 0.364 unit; in other words, when corruption reduces by 1 unit, poverty reduces by 0.364 unit. Similarly, the coefficient of political stability (0.083), has a positive relationship with HDI in the long-run. The implication of this result is that; an improvement in political stability (reduction in political instability) by 1 unit would lead to an improvement in HDI (poverty reduction) by 0.083 unit, because the unstable political environment does not only affect growth but also affect

poverty, hence making the region to be poor (Abu, Karim & Aziz 2014; World Bank 2017b).

Furthermore, government consumption expenditure (0.007), and trade (0.191) are positively significant on HDI, i.e. reducing poverty. The increase in government expenditure by 1% would improve HDI by 0.007 unit, affirming the studies of (Edrees, Azali, Azman & Nor 2016; Marisa, Hidalgo-Hidalgo & Iturbe-Ormaetxe 2018; Mehmood & Sara 2010) while an increase in trade by 1% will impact on HDI by 0.191. However, among the variables of interest, considering their coefficients' values, corruption is the most effective on HDI, because the leaders in charge of policy formulation and implementation are corrupt. This is followed by trade, which is due to its abundant and endowed resources (Dankumo, Ishak, Bani & Hamzah, 2020), while the impact of political instability is attributed to the fact that the largest population of the SSA countries are engaged in occupations- farming, fishing, mining- that are affected by political instability to earn a living. This signifies how vital governance (corruption and political stability) is in reducing poverty (HDI) in the region of SSA, and expenditure is seen to impact less when compared to governance, as its impact is mostly affected by the nature of governance. Hence the need to give more attention to ensuring good governance (low corruption and political stability).

In the short-run, all the coefficients are not significant, except control of corruption (0.029) that is significant at 5% level but having a little value of intercept. Control of corruption has a short-run association with poverty, having a positive relationship with HDI (negatively related with poverty), as it increases (low corruption) in the short-run by 1 unit, it would improve HDI (fall in poverty) by 0.029 unit. The short-run estimates and the relationship also provide additional insights into how poverty (HDI) changes with variation in the explanatory variables, especially corruption.

## **CONCLUSION**

This paper examines the relationship between governance (corruption and political instability), public expenditure, trade and poverty reduction in Sub-Saharan African countries, using PMG by Pesaran et al. (1999) to tackle the problem of heterogeneity in conducting plausible tests in SSA. Our results show that a long-run relationship exists between governance (corruption and political instability), public expenditure, trade and poverty reduction in the SSA region. Specifically, control of corruption has both short-run and long-run relationship with HDI (poverty reduction) as it impacts positively in both the short-run and the long-run, i.e. improve control of corruption (perceived fall in corruption) increase HDI (increase poverty reduction). Simply put, a fall in corruption is associated with a fall in poverty and vice versa. On the other hand, political stability, government expenditure and trade are also positively related to HDI (poverty reduction) in the long run. This outcome implies that controlling corruption and ensuring a stable political system is vital in achieving poverty reduction in SSA. This means that in the long-run, further increase in control of corruption and political stability would positively affect HDI, i.e. poverty will decrease, which

may prompt us to conclude that allowing the continual existence of corruption and political instability would harm poverty reduction.

Therefore, the governments in SSA must deal with corruption by reinforcing their anti-graft agencies, reform the judiciaries, perform oversight functions and punish defaulters. Lastly, political stability should be pursued through inclusive governance and ensuring hygiene in politics to increase peoples' confidence in the government in order to lessen crisis and protest, which may collectively affect poverty through enhancing public expenditure effectiveness and increased trade.

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