Institutional quality and economic growth: evidence from Sub-Saharan Africa countries

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Abstract

This paper employs two step systems GMM to analyse the effect of institutional quality on economic growth for Sub-Saharan African countries for the period from 2006 to 2018. The findings show that an improvement on institutional quality positively and significantly improve Sub-Saharan African countries output. The findings further provide evidence that the effect of institutional quality on output varies with regional location of SSA countries. In particular, institutional qualities are more effective in driving income growth in West African region than the other three regions of Eastern Africa and Central Africa. In addition, the findings indicate that the impact of institutional quality on output growth varies with income level of SSA countries. An improvement in intuitional quality is more likely to improve economic performance of low income SSA economies than the middle income SSA countries. SSA countries should strengthen independent institutional bodies that prosecute economic crimes. Also, African countries should support African agendas that are aligning with global development agenda. Sub-Saharan African countries should strengthen institutions that widen democratic space, civil liberty and the participation of citizen in the development agenda of a country.

Key words: Institutional quality, economic growth, two-step system GMM, Sub-Saharan Africa
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1.0 Background

Public institutions and governance that are inclusive are capable of delivering quality services that are important in improving people's welfare. This is in line with the Sustainable Development Goals (SDGs) which advocate for strong institutions. Developing countries have recently embarked on radical reforms that are aimed at improving governance. This has been informed by the realization that good institutions are important in improving economic growth. North (1992) for example argues that good governance provides rules that are consistent and in the form of institutions that are important for sustainable-growth. However, poor economic performance is associated with bad institutions (Butkiewicz and Yanikkaya, 2006). If weak institutions negatively influence income growth then policy actors should design policies that strengthen institutions (Aron 2000).

Majority of the African countries possess weak institutional framework (Aron, 2000). Empirical studies have shown that Sub-Saharan African (SSA) countries over the years have experienced stagnating economic growth in relation to other regions across the globe. The Country Policy and Institutional Assessment (CPIA, 2016) indicate that institutional quality weakened in Sub-Saharan Africa. The average score for public sector management and institutional quality for SSA countries in 2016 was 3.0. The average score for fragile countries was 2.8. Non-fragile countries had an average score of 3.3 while non-resource-rich countries had a mean score of 3.1 and resource-rich countries averaged 3.0.

SSA countries lag in the protection of property rights (PRs) and corruption control (World Bank, 2017). Table 1 illustrates that PRs and rules-based governance indicator for SSA countries is lower than other regions. SSA countries have an average score of 2.77 while North Africa and Middle East score 2.30. The average score for PRs and rules-based governance indicator for other regions is above 3.0. The low scores in SSA imply misappropriation of public resources that could be effectively channelled toward productive development programs. The low score in SSA is attributed to political and ethnic conflict in many countries, continued violence and corruption which are keeping institutions unaccountable (World Bank, 2017).

Table 1: Property rights and rule-based governance indicator

Region	2005	2010	2015	2016	2017	Mean
East Asia & Pacific	3.05	3.09	3.10	3.07	3.07	3.08
Europe & Central Asia	2.95	3.00	3.00	3.00	3.00	2.99
Latin America & Caribbean	3.33	3.17	3.17	3.25	3.25	3.23
Middle East & North Africa	2.50	2.50	2.25	2.25	2.00	2.30
Sub-Saharan Africa	2.76	2.76	2.76	2.79	2.76	2.77

Source: World development indicators

The low institutional quality experienced in SSA countries explains the poor economic performance in SSA. Hall *et al*., (2010) and Acemoglu and Robinson (2010) for example found that difference in cross country economic growth for SSA is attributed to the differences in institutions. Equally, the difference in economic performance between Nigeria and Botswana is explained by differences in institutions between the two countries (Fosu *et al.*, 2019). Reforms that target institutions are therefore crucial in the realization of improved economic performance for SSA countries. Despite major institutional reforms in SSA, institutional quality in SSA has

remained weak compared to other regions. Empirical studies have demonstrated that stagnating economic growth witnessed in SSA countries during 1980s was due to weak institutions while robust economic performance in the 1990s was a result of improved institutions (Ndulu *et al.*, 2008). According to Thorbecke (2013), an improved institutional quality has been found to be important in creating enabling environment for African economic prosperity. Botswana for example has realized economic fortune because it managed to adopt good economic policies. This is in contrast to countries like DRC, Central Africa Republic and Sierra Leone which have been bedevilled with civil wars which negatively impacts on their economic success (Acemoglu *et al*., 2002).

North (1992) provides a broader definition of governance as "rules of the game in society or, more formally, are the humanly devised constraints that shape human interaction." Some empirical studies have measured institutional quality by using standard deviation of volatile variables like monetary variables and tax rates (Kormedi and Meguire 1985). Other measures of institutional quality are from the International Country Risk Guide's (ICRG). ICRG computation of risk is based on three categories of variables: (1) political approach (2) financial approach and (2) economic approach. Political risk assesses the political stability of countries covered by ICRG[2]. The World Bank provides six indicators of institutional quality: "Political stability, voice and accountability, government effectiveness, regulatory quality, rule of law, and control of corruption."

Since the institutional data that have been used by researchers are mostly subjective, there may be a problem of bias in ratings (Chong *et al*., 2000). Empirical researchers use indicators rather than actual measure of governance since quality of governance is not measurable (Kagundu 2006). This study will therefore employ Kaufmann and Kraay (2011) six indicators of governance. Unlike other previous studies which have used OLS, fixed effect and random effect estimator, this paper employed two-step system GMM to estimate dynamic panel data. The dynamic GMM technique has the advantage that it introduces dynamics, control for endogeneity and heterogeneity. Estimates from GMM techniques are therefore more valid than static model estimates.

The study reinforces the 16th goals on the SDGs which advocate for peace, justice and strong institutions. Strong institutions that deliver quality education and healthcare would enhance income growth. This paper provides new evidence on output growth and institutional quality for SSA countries. Studies that focus on institutional quality and income level in SSA are scanty. Furthermore, the potential regional heterogeneity across SSA sub-regions has not been explored by the existing studies. This study therefore examined whether the effect of institutional quality on output growth varies with regional location.

The rest of the paper is organized as follows. Section 2 summarizes literature on the effect of institutional quality on economic growth in Sub-Saharan Africa. Section 3 describes the methodology. Section 4 presents the data and descriptive statistics. Section 5 presents the empirical analysis and is followed by a section on conclusion.

2.0 Literature review

This section focuses on both theoretical and empirical literature that underpins the effect of institutional quality on output growth. Leff (1964) and Huntington (1968) opined the "grease the

[2]See https://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf on methodology

wheels" hypothesis that suggests that corruption is beneficial to economic activities. According to this hypothesis, corruption may circumvent inefficiencies associated with bureaucracy in investment. Corruption therefore acts as trouble-saving device that improves efficiency in investment thereby raising economic growth. However, Mauro (1995), Brunetti and Weder (1998) and Meon *et al*., (2005) observed a significant negative link between corruption and investment that extend to growth. North (1990) argues that well-defined property rights are important drivers of income growth. Rule of law encompasses maintenance of property rights and absence of corruption. Property rights and rule of law can affect the incentives to invest and innovate

The nature of the political regime which fosters economic growth has remained inconclusive (Przeworski *et al*., 1995). Two strands of view on how institutions affect economic growth are grounded on liberal and authoritarian institutions. Totalitarianism contributes significantly to poor economic outcome (Ndulu and O'Connell, 1999). The argument is based on the premise that good governance allows citizens to participate in the political process and this makes them feel as part of the process which consequently improves productivity. However, under authoritarian rule the citizens are detached from the political process of a country and this result in low morale among the public which negatively impacts on their productivity. Liberal institutions hypothesized that democracy positively impacts on economic growth. Rodrik (2004) argues that democracy significantly stimulates output growth. However, according to La Porta *et al*. (1999) developing nations experience robust economic growth under authoritarian regimes and only adopt democracy after achieving economic growth.

According to Butkiewicz *et al*., (2006), democratic institutions may either improve economic performance of a country or retard growth. Butkiewiz *et al*., (2006) posits that democracy might undermine investment through pressures for immediate consumption. Immediate consumption leads to dissaving which undermines investment and thus reduces steady-state income. However, a number of studies have established that democracy promotes economic performance (Bardhan, 1997; Rodrik, 2000; Durham, 1999; Przeworski and Limongi, 1993). According to Rodrik (2000), "participatory and decentralized political systems enable higher-quality growth: they allow greater predictability and stability, are more resilient to shocks, and deliver superior distributional outcomes". Political instability is associated with adverse effect on growth. According to Fosu (1992), political instability is associated with lose in capital since political instability may reduce availability of factors of production as investment risk tends to go high in the presence of political instability. Further, political instability is associated with uncertainty and risks which discourages foreign direct investments and instead would lead to capital flight.

The theory of rent-seeking also helps explain how institutions affect economic growth. Rent-seeking is the activity of an interest group in trying to seize an income flow as opposed to creating an income flow. Interest groups with vested interest in government projects will use resources to influence decisions of the governments thereby result in misallocation of the available resources. Rent seeking can be achieved through bribery, threats and lobbying of the institutions to make decisions that go against the will of the majority in the society. The end result of rent-seeking is skewed allocation of resources which may lead to poor economic performance of a country.

Using a sample of 55 countries for the periods 1972-1995, Chong and Calderon (2000) examined the causation between institutional quality and output. Institutional quality was proxied by infrastructure quality, nationalization potential, contract enforceability and bureaucratic delay. The finding showed that reverse causality exists between economic growth and institutional quality.

Aidt *et al*. (2008) sampled 67 to 71 countries to examine how corruption and governance regime relates to a country's income growth. The sampled countries were all drawn from the five continents. The study used GMM to compute parameter estimates. The findings showed that the impact of corruption on output is regime specific. Evidence further showed that corruption slows down output growth for countries with quality political institutions.

Comeau (2003) investigated whether democracy contributes significantly to economic growth. The author sampled 82 countries for the period 1970-1980. The paper used OLS estimation technique to achieve the estimates. The study projected that democracy significantly and positively impacts economic growth. The result further established a nonlinear link between democracy and growth.

Dollar and Kraay (2003) examined the effects of trade and institutions on income growth of 168 countries between the years 1970-1980. The authors used OLS estimation technique. The result showed that both trade and institutions significantly impact income growth. One major drawback of this paper is the use of OLS to estimate panel data. OLS is known to be inconsistent if the unobserved characteristics are correlated with the explanatory variables.

Glaeser *et al*. (2004) estimated impact of institutions on output for sampled 77 countries. The author employed OLS to estimate the parameters for the periods 1960-2000. Result showed that human capital significantly impacts economic growth. However, the study found that institutional quality plays no significant role on economic growth. Bräutigam and Knack (2004) sampled 32 SSA countries to assess if institutions, foreign aid impact income growth. The author employed OLS and 2SL and the quality of governance was measured by subjective indexes from the ICRG. The result indicated that increases in GDP per capita enhance quality of governance while governance deteriorates in the presence of political strife.

Gwartney *et al*. (2004) studied the impact of economic freedom and institutional quality on income. The study sampled 100 countries for the period 1980-2000. Institutional quality was measured by Economic Freedom of the World (EFW) index. Evidence showed that countries with good and consistent institutions have better economic outcomes and higher income levels.

Méon and Sekkat (2005) controlled for corruption and quality of governance on examining income variation across 63 and 71 countries for the period 1970-1998. The study employed OLS estimation technique. The findings showed that corruption impedes both income level and investment. Djankov *et al*. (2006) sampled 135 countries for the period 19930-2002. The research aimed at examining whether regulation has a bearing on income growth. Institutional quality was proxied by regulation index. The study analysed the magnitude of business regulatory index on growth by use of OLS. The result showed that government regulation of business significantly improves a country's income level.

Butkiewicz and Yanikkaya (2006) used two large samples of least developed economies and developed economies in examining how institutional quality impacts output growth. The study used five distinct measures of democracy and six composite index of rule of law. The model was estimated by seemingly unrelated regression (SUR) technique. The result indicated that democratic institutions enhance growth while rule of law has non-significant effect on income level

Aixalá *et al.* (2008) applied OLS, 2SLS and GMM to study institutional quality and output growth. The study used a sample of rich and poor economies for the years 1996-2000. The result showed that economic growth is explained by the variation in control for corruption. Rule of law significantly explains economic growth in rich countries.

Fayissa and Nsiah (2013) investigated the importance of governance in Africa for the periods 1995-2004. The study employed GMM procedure for a sample of 39 SSA countries. The governance indicators were derived from factor analysis of World Bank governance indicators. The study showed that good governance significantly improve economic growth

Nawaz, *et al*, (2014) analyzed the link between institutional quality and income growth. Samples of the countries considered in the study were drawn from Asia. The study period was 1996-2012. Estimation technique involved application of dynamic GMM. Findings showed institutions significantly impact economic growth for Asian economies. The impact of institutional quality on output depends on the income level of countries. For example, the result showed that the impact of intuitional quality on income level is stronger in developed economies of Asian countries than LSD counterparts.

Iheonu *et al,* (2017) investigated if institutional quality impacts on output variation for 12 West African countries for the periods 1996-2015. The study employed FE, RE and the panel 2SLS technique. Institutional quality index that was used comprised of rule of law, regulatory quality, government effectiveness and control for corruption. The result showed institutional quality positively and significantly impact economic growth. Daniel *et al*, (2018) sampled 35 African countries. The study was conducted for the year 2006-2015. The paper investigated if institutional quality contributes to income level. A multi-level modelling technique was used in the estimation process. Result from the study showed that institutional quality significantly enhances firm's performance for African countries.

Kimaro *et al.* (2017) analyzed the impact of government expenditure and efficiency on economic growth of Sub Saharan African low income countries spanning from 2000-2015. The paper used a panel data of 25 SSA low income countries and employed Generalized Methods of Moments (GMM) to answer the research questions. The finding reveals that government expenditure enhances growth of low income SSA countries.

Abubakar (2020), using annual time series data covering the period 1979 to 2018, investigated the effect of institutional quality on economic growth in Nigeria. The study adopted Johansen Cointegration test in the econometric analysis of the relationship between the variables. The empirical findings showed that institutional quality significantly influences economic growth for Nigeria.

Literature that explores institutional quality and income is ambiguous. Additionally, consensus is yet to be reached on what constitute the correct measure of institutional quality. Different authors have used various approaches to measure institutional quality and this has contributed to divergent results. The study contributes to the debate by using Kaufmann and Kraay (2011) six indicators of governance which has the advantage over other measures. Empirical literature has also used various estimation techniques ranging from pooled OLS, static model (FE and RE) and dynamic panel. These estimation techniques are associated with different estimation problems which this

study seeks to solve. The study also provided new evidence on the effect of institutional quality on income while taking into account the regional difference.

3. Methodology

To examine the effect of institutional quality on economic growth, this study adopts Cobb Douglas production as specified by Chong and Gradstein (2007).

$$y_{it} = Ak_{it}^{\emptyset} \; and \;\; 0 < \emptyset > 1 \quad (1)$$

From equation (1), *y* denotes income per worker and *k* is capital per worker, *A*>0 is total factor productivity; *it* denotes country *i* at period *t*. Endogenous growth model is modified to include institutional quality. According to Nawaz, *et al*, (2014), weak institutions diverts resources to unproductive sector hence cause low growth while well-developed institutions enhance growth. Weak institutions promote rent seeking behaviour while strong institutions reduce incidences of rent seeking. Rent seeking behaviour is associated with diversion of resources from productive use to unproductive use.

Chong and Gradstein (2007) for example emphasized that resources meant for productive sector are easily diverted to unproductive sector by rent seekers. However, as Chong and Gradstein (2007) observe, strong institutions cushion against rent seeking behaviour and therefore economic growth accelerate in the presence of strong institutions. The production function is redefined to capture the rent-seeking. Rent-seeking activities act as a distortion in the production process. Equation (2) is rewritten as:

$$y_{it} = (1 - \tau_{it})Ak_{it}^{\emptyset} \quad (2)$$

Where $\tau_{it} \epsilon [0, \tilde{\tau}]$, $\tilde{\tau}$ indicates rent seeking activities. The paper assumes that the proportion of rent seeking for each firm depends on the quantity of rent seeking and the quality of governance. The quantity of rent seeking τ_{it} approaches 0 when there are strong institutions while the quantity of rent seeking τ_{it} approaches 1 with weak institutions. Marginal utility of renting seeking is at maximum when τ_{it} approaches 1. If the marginal utility of $\tau_{it}$is high then this impliesweaker institutions. Weaker institutions are therefore associated with low productivity of factors of production and vice versa. Thus τ_{it}creates economic distortion in the factor productivity. Distortions are as a consequence of weak institutions.

The paper considers a representative agent who maximizes intertemporal utility and is constrained by dynamic budget. The preference of representative agents is in the following form:

$$U_{it} = \int_0^{\infty} \frac{c_{it}^{1-Y}}{1-Y} e^{-\rho t} dt, \qquad Y > 0 \qquad (3)$$

Where c_{it} represents private consumption in per capita and ρ denotes trade-off between current and future time. If >0thenfuture consumption is preferred to the current consumption. The per capita dynamic budget constraint is given by equation (4):

$$\dot{k} = \frac{dk}{dt} = (1 - \tau_{it})Ak_{it}^{\emptyset} - c_{it} \quad (4)$$

Equation (4) satisfies the transversality condition ie$\lim_{t\to\infty} k\lambda e^{-\rho t} = 0$, i.e marginal change in capital stock equals the total saving. The difference between output and consumption also equals change capital. The capital (k_{it}) is determined by the individual choice of optimal consumption (c_{it}) and investment path. Hamiltonian function is set up as follows to get optimal allocation of resources by the individual;

$$H = \frac{c_{it}^{1-\gamma}}{1-\gamma} e^{-\rho t} + \lambda\left[(1-\tau_{it})Ak_{it}^{\emptyset} - c_{it}\right] \quad (5)$$

$$\frac{\dot{y_{it}}}{y_{it}} = \frac{\dot{c_{it}}}{c_{it}} = \frac{(1-\tau_{it})(A\emptyset k_{it}^{\emptyset-1})}{\gamma} - \frac{\rho}{\gamma} \qquad (6)$$

Equation (6) demonstrates that as the quality of institutions improves, the rent seeking behaviour decreases. Decrease in rent seeking activities contributes to an increase in income level. The first derivative of equation (6) with respect to τ_{it} yields equation (4.7) which shows that output decreases as the value of τ_{it} increases as$\gamma > 0$.

$$\frac{d(\frac{\dot{y_{it}}}{y_{it}})}{d\tau_{it}} = -\frac{\left(A\emptyset k_{it}^{\emptyset-1}\right)}{\gamma} > 0 \qquad (7)$$

The theoretical model has demonstrated that large value of τ_{it} is associated with lower GDP growth. Therefore as the institutional quality improves, there is a reduction in rent seeking activities and hence an improvement in economic growth. For example, when$\tau_{it} = 0$, institutions are strong hence economy grows with $\frac{\emptyset A k_{it}^{\emptyset-1} - \rho}{\gamma}$ while when 0<$\tau_{it} < \tilde{\tau}$, institutions are week the output grows with$\frac{\emptyset(1-\tau_{it})Ak_{it}^{\emptyset-1} - \rho}{\gamma}$.

Loagarithmic transformation of equation (6) can be written as;

$$\dot{y}_{it} = \delta_0 + \xi I_{it} + \phi k_{it} + \mathcal{U}(8)$$

Where $\dot{y}_{it}$ defines GDP growth rate while I_{it} is institutional quality both for country *i* at time *t*. Equation 8 is the baseline model for estimating institutional quality and GDP growth.

Lagged value of GDP growth rate is introduced in the baseline model to capture the effect of persistence of growth. Equation (9) contains the six indicators of institutional quality a vector of control variables (Z_{it}) which includes domestic savings, inflation, capital and labour force.

$$GDP_{it} = \delta_0 + \sigma GDP_{it-1} + \delta_1 VA_{it} + \delta_2 PV_{it} + \delta_3 GE_{it} + \delta_4 RQ_{it} + \delta_5 RL_{it} + \delta_6 CC_{it} + \delta_7 Z_{it} + \mathcal{U}_{it} \quad (9)$$

Equation (9) is modified to include dummy variables of SSA sub regions plus interaction with each indicator of institutional quality. The coefficient of the interaction term estimates the regional differences in the effects of institutional quality on economic growth in SSA.

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 VA_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * VA_{it}) + \delta_6 (CA_i * VA_{it}) + \delta_7 (WA_i * VA_{it}) + \delta_7 Z_{it} + \mathcal{U}_{it} \ (10)$$

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 PA_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * PA_{it}) + \delta_6 (CA_i * PA_{it}) + \delta_7 (WA_i * PA_{it}) + \delta_7 Z_{it} + \Omega_{it} \quad (11)$$

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 GE_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * GE_{it}) + \delta_6 (CA_i * GE_{it}) + \delta_7 (WA_i * GE_{it}) + \delta_7 Z_{it} + \mho_{it} \quad (12)$$

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 RQ_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * RQ_{it}) + \delta_6 (CA_i * RQ_{it}) + \delta_7 (WA_i * RQ_{it}) + \delta_7 Z_{it} + \xi_{it} \quad (13)$$

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 RL_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * RL_{it}) + \delta_6 (CA_i * RL_{it}) + \delta_7 (WA_i * RL_{it}) + \delta_7 Z_{it} + \chi_{it} \quad (14)$$

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 CC_{it} + \delta_2 EA_i + \delta_3 CA_i + \delta_4 WA_i + \delta_5 (EA_i * CC_{it}) + \delta_6 (CA_i * CC_{it}) + \delta_7 (WA_i * CC_{it}) + \delta_7 Z_{it} + \varphi_{it} \quad (15)$$

Equations (10), (11), (12), (13), (14) and (15) relate GDP growth rate, regional dummy variables and the interaction term (regional dummy variables interacted with institutional quality). To avoid the problem of dummy variable trap, the Southern Africa (SA) dummy variable and its interaction was dropped. $\mathcal{U}_{it}, \Omega_{it}, \mho_{it}, \xi_{it}, \chi_{it}, \varphi_{it}$ are composite error terms for the respective equations.

Equation (9) is modified to include dummy variable for low and middle income SSA countries. This establishes whether the effect of institutional quality on growth varies with income level of SSA countries.

Dummy variable is defined as:

$$D = \begin{cases} 1 & if\ the\ country\ is\ middle\ income \\ 0 & if\ the\ country\ is\ \ low\ \ \ income \end{cases}$$

Variable D measures the difference in the two intercept terms. Therefore equation (9) can further be modified to include dummy variable such that;

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 VA_{it} + \delta_2 PV_{it} + \delta_3 GE_{it} + \delta_4 RQ_{it} + \delta_5 RL_{it} + \delta_6 CC_{it} + \delta_7 Z_{it} + \text{þ}D + \mathcal{U}_{it} \quad (16)$$

Where $\text{þ} = (\delta_{1I} - \delta_{0i})$

Equation (16) is modified to include the interactions involving dummy variable. This is to test if the effect of each component of institutional quality on growth is the same for both middle and low income countries. Model in equation (16) thus becomes;

$$GDP = \delta_0 + \sigma GDP_{it-1} + \delta_1 VA_{it} + \delta_2 PV_{it} + \delta_3 GE_{it} + \delta_4 RQ_{it} + \delta_5 RL_{it} + \delta_6 CC_{it} + \delta_7 Z_{it} + \text{þ}D + \delta_8 Insti * D + \mathcal{U}_{it} \quad (17)$$

Therefore β measures the difference in intercept between middle and lower income countries in SSA while δ_8 measures the difference in the effect of institutional quality between middle and lower income countries.

Estimation of the link between institutional quality on income level suffers from potential endogeneity problems. Empirical studies have shown existence of reverse causation between institutional quality and output growth. Equally, lagged value of the dependent variable as a regressor may lead to the problem autocorrelation. Both the RE and the FE estimates are inconsistent in this scenario. In the presence of dynamic and endogenous independent variables, both system and difference GMM provides consistent estimates (Roodman, 2009). System and difference GMM are designed for small T, large N, dynamic dependent variable, control variables and fixed effects. However, the objective of the study was achieved by estimating the equations using two-step system GMM and taking into account the number of instrument counts. System GMM provides more efficient estimates than difference GMM

4.0 Variable measurements and descriptive statistics

The dependent variable in this paper is economic growth while the explanatory variables include the six indicators of institutional quality and a number of control variables. The paper adopted a panel data from 35 SSA countries for the period 2006-2018.The data was sourced from World Development indicators (WB, 2019). Table 2 provides descriptive statistics in terms of mean and standard deviation for pooled observations for SSA countries, middle-income countries and low-income. GDP growth rate for pooled observation for SSA countries averages 4.53 percent with a standard deviation of 4.85 percent. Middle income countries reported higher average growth rate of 4.62 percent than low income countries. Government effectiveness averaged -0.642 with a standard deviation of 0.614 for the sample for SSA countries, middle income countries averaged -0.247 with a standard deviation of 0.631, and low income countries averaged -0.906 with a standard deviation of 0.436. On the average, political stability was -0.497 with a standard deviation of 0.945 for SAA countries, middle income countries had a mean of -0.138 with a standard deviation of 1.033 while low income countries had a mean of -0.736 with a standard deviation of0.799.

Table 2: Descriptive statistics

	SSA			Middle-Income SSA countries			Low-Income SSA countries		
Variable	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.
GDP	455	4.535	4.847	182	4.624	3.981	273	4.476	5.354
Government effectiveness	455	-0.642	0.614	182	-0.247	0.631	273	-0.906	0.436
Political stability	455	-0.497	0.945	182	-0.138	1.033	273	-0.736	0.799
Rule of Law	455	-0.627	0.657	182	-0.266	0.704	273	-0.867	0.496
Voice and Accountability	455	-0.500	0.704	182	-0.141	0.776	273	-0.740	0.532
Control for Corruption	455	-0.547	0.616	182	-0.216	0.725	273	-0.768	0.402
Regulatory Quality	455	-0.503	0.700	182	-0.249	0.606	273	-0.673	0.708
Inflation	455	65.702	1145.341	182	7.569	6.889	273	104.457	1478.431
Labor	455	52.106	15.306	182	42.074	12.223	273	58.794	13.394
Capital	455	20.066	8.680	182	22.359	9.286	273	18.537	7.907
Domestic Saving	455	8.433	20.885	182	17.423	17.693	273	2.439	20.727

On the average, rule of law for SSA countries is -0.627 with a standard deviation of 0.657, middle income countries is -0.266 with a standard deviation of 0.704 while low income countries averaged -0.867 with a standard deviation of 0.496. The descriptive statistics further revealed that voice and accountability averaged -0.500 with a standard deviation of 0.704 as compared to low income countries with a mean of -0.740 and a standard deviation of 0.532. On average, control for corruption for SSA countries is -0.547 with a standard deviation of 0.616, the mean for middle income countries is -0.216 with a standard deviation of 0.725 while the mean value for control for corruption for low income countries is -0.768 with a standard deviation of 0.402. Regulatory quality for SSA countries averaged -0.503 with a standard deviation of 0.700, middle income countries has a mean of -0.249 with a standard deviation of 0.606 while low income countries had a mean of -0.673 with a standard deviation of 0.708.

5.0 Empirical results and discussion

Table 3 presents the econometric results for the effect of institutional quality on economic growth in SSA. The estimates show that initial value of GDP growth rate, labour and savings significantly impact on the current economic growth ($p<0.001$). The findings in Table 3 indicate that government effectiveness, political stability and absence of violence, rule of law, voice and accountability, control of corruption and regulatory quality positively and significantly impact economic growth in SSA. Government effectiveness positively and significantly impacts economic growth at 1 percent level. An improvement in government effectiveness leads to 6.475 units increase in economic performance for SSA. The coefficient of political stability and absence of violence is positive and significant ($p<0.001$). This implies that an increase in political stability and absence of violence causes 2.95 unit increases in economic growth for SSA.

Table 3: The effect of institutional quality on economic growth

Regressors	(Model1) GDP	(Model2) GDP	(Model3) GDP	(Model4) GDP	(Model4) GDP	(Model5) GDP
L.GDP	0.112***	0.0905***	0.122***	0.0874***	0.162***	0.217***
	(0.0217)	(0.0181)	(0.0151)	(0.0106)	(0.0166)	(0.0117)
Inflation	4.30e-05***	5.28e-05***	0.000178***	0.000179***	3.29e-05***	2.39e-05**
	(3.53e-06)	(4.20e-06)	(9.38e-06)	(1.57e-05)	(3.76e-06)	(9.04e-06)
Labour	0.141***	0.0977***	0.205***	0.165***	0.0806***	0.0706***
	(0.00907)	(0.00291)	(0.00707)	(0.00643)	(0.00325)	(0.00458)
Savings	-0.00110	0.0226***	-0.0454***	0.0166***	0.0316***	0.0276***
	(0.00391)	(0.00448)	(0.00286)	(0.00169)	(0.00232)	(0.00284)
GE	6.475***					
	(0.844)					
PV		2.956***				
		(0.190)				
RL			11.80***			
			(0.572)			
VA				11.14***		
				(0.840)		
CC					1.760***	
					(0.335)	
RQ						1.010**
						(0.372)
Observations	420	420	420	420	420	420
Number of ID	35	35	35	35	35	35

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The econometrics estimates further show that rule of law has a positive and significant effect on economic growth in SSA (p<0.001). An improvement in rule of law leads to 11.14 unit increase in economic growth in SSA. Control for corruption is associated with positive and significant effect on economic growth in SSA (p<0.001). An increase in control for corruption will lead to 1.760 unit improvement in economic performance of SSA. The finding further shows that regulator quality is a significant predictor of economic growth in SSA. An improvement on regulatory quality is associated with 1.010 unit increase in economic performance of SSA. All measures of institutional quality contribute significantly to economic growth. Our finding supports Nawaz *et al*. (2014) and Iheonu *et al*. (2017).

Table 4 provides long run effect of institutional quality on economic growth in SSA. All the measures of institutional quality have significant and positive effect on economic growth in SSA in the long run. Compared to short run results, the impact of institutional quality is stronger in the

long run than in the short run. This is demonstrated by larger magnitude of coefficients in the long run.

Table 4: The effect of institutional quality on economic growth in the long-run

Variable	Coef.	Std.Err.	z	P>|z|
Government effectiveness	7.290	0.813	8.970	0.000
Political stability	3.251	0.218	14.900	0.000
Rule of Law	13.431	0.807	16.650	0.000
Voice and Accountability	12.211	0.919	13.290	0.000
Control for Corruption	2.101	0.375	5.600	0.000
Regulatory Quality	1.290	0.461	2.800	0.005

Tables 5 and 6 present result on regional difference in the effect of institutional quality on economic growth in SSA. The impact of rule of law on output varies with SSA regions. Specifically, the influence of rule of law on output is statistically significant ($p<0.00$) and positive for the West African countries. Estimated coefficient implies that an improvement on rule of law in West African region leads to 12.15 units increase in economic performance. However, the result indicates that rule of law is not an important driver of GDP growth in East African region. Voice and accountability insignificantly impacts output of countries in East African region. However, voice and accountability enhances growth in the West African region. An improvement in voice and accountability is associated with 11.01 unit rise in growth for West African region. Regulatory quality positively determines growth for the West African countries. An improvement in regulatory quality will lead to 13.39 unit increase in growth in West African region. Equally, government effectiveness drives GDP growth for countries in the West African region. The effect of government effectiveness is significant ($p<0.001$). Therefore an improvement in government effectiveness will lead to 15.72 unit rise in output growth in West African region.

Table 5: Regional differences in the effect of institutional quality on economic growth in SSA

VARIABLES	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP
L.GDP	0.0865* (0.0437)	0.354*** (0.110)	0.00254 (0.0488)	0.0685** (0.0235)	0.252** (0.107)	0.0838*** (0.0217)
Inflation	0.135* (0.0635)	-0.351 (0.272)	0.0814** (0.0313)	0.0785* (0.0382)	0.0269 (0.167)	0.130** (0.0591)
Labour	-0.00318 (0.239)	-0.151 (0.209)	-0.101 (0.181)	-0.0703 (0.232)	0.205 (0.229)	0.172 (0.225)
Domestic Saving	-0.0539*** (0.0110)	0.175 (0.220)	0.0363*** (0.0119)	0.0155 (0.0120)	0.264* (0.141)	-0.0969*** (0.0173)
WA	12.85 (12.66)		14.88 (9.917)	11.86 (11.54)		1.055 (12.11)
RL*WA	12.15*** (2.397)					
EA		10.83 (11.51)			-9.709 (13.77)	
VA*EA		-9.540 (11.82)				
VA*WA			11.01*** (2.066)			
CC*WA				8.988*** (0.625)		
RQ*EA					2.478 (3.125)	
RQ*WA						13.39*** (2.388)
Observations	180	120	180	180	120	180
Number of ID	15	10	15	15	10	15

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Regional differences in the effect of institutional quality on economic growth in SSA

VARIABLES	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP
L.GDP	0.339*** (0.101)	5.05e-05 (0.0348)	0.317*** (0.0962)	0.121** (0.0422)	0.335** (0.113)
Inflation	0.113 (0.187)	0.0200 (0.0306)	-0.154* (0.0822)	0.112* (0.0629)	-0.0298 (0.195)
Labour	0.0115 (0.148)	-0.352 (0.228)	0.0868 (0.182)	-0.0789 (0.209)	0.0728 (0.213)
Domestic Saving	0.563** (0.230)	-0.0281** (0.0118)	0.211 (0.158)	0.00515 (0.00969)	0.374* (0.200)
EA	2.818 (8.583)		-2.788 (10.90)		-1.833 (12.83)
GE*EA	12.61 (8.681)				
WA		35.25** (12.03)		8.541 (11.41)	
GE*WA		15.72*** (2.430)			
PA*EA			-2.078 (2.029)		
PA*WA				4.153*** (0.806)	
RL*EA					3.889 (6.915)
Observations	120	180	120	180	120
Number of ID	10	15	10	15	10

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The result indicates that an increase in control of corruption in the West African region positively and significantly impacts output (p<0.001). An improvement in control of corruption leads to 8.988 unit increase in economic growth. Political stability improves economic performance in West African region. Political stability is statistically significant (p<0.001). An improvement in political stability will lead to 4.153 unit increase in economic growth. The result has shown that different components of institutional quality perform differently in each SSA regions.

Table 7 presents estimates on whether the effect of institutional quality on output growth varies with the income level of SSA countries. The coefficient of the interaction term for government effectiveness is positive and statistically significant (p<0.001). Therefore GDP growth rate in middle income countries will grow by more than 12.04 units as compared to low income countries when there is an improvement in government effectiveness. The coefficients of the interaction term on political stability, rule of law, regulatory quality and control for corruption are statistically insignificant. This implies that an improvement on political stability, control for corruption,

regulatory quality and rule of law in middle income countries in SSA have non-significant effect on income compared to the low income economy.

Table 7: The effect of institutional quality on economic growth for middle income countries in SSA

VARIABLES	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) GDP	(6) GDP	(7) GDP
L.GDP	0.140***	0.132***	0.166***	0.151***	0.153***	0.145***	0.193***
	(0.0284)	(0.0262)	(0.0273)	(0.0218)	(0.0206)	(0.0254)	(0.0179)
Government effectiveness	0.909	-6.533***	4.285*	0.0877	0.750	1.142	1.863
	(2.409)	(1.795)	(2.474)	(2.184)	(2.034)	(2.199)	(2.204)
Political stability	-0.911*	-0.468	0.605	-0.291	-0.346	0.172	0.333
	(0.490)	(0.560)	(0.764)	(0.506)	(0.474)	(0.833)	(0.533)
Rule of law	1.078	5.438*	1.757	5.871**	0.667	1.003	3.906**
	(1.904)	(2.834)	(2.572)	(2.176)	(1.542)	(2.028)	(1.647)
Voice and accountability	6.176**	2.651	0.441	0.782	5.240**	5.325***	0.0229
	(2.513)	(3.149)	(2.588)	(2.204)	(1.995)	(1.781)	(2.260)
Control of corruption	-1.926	0.822	-0.367	-0.692	-2.130	-0.871	-1.575
	(1.543)	(1.446)	(2.253)	(1.866)	(1.627)	(2.274)	(1.884)
Regulatory quality	-0.330	-1.203	-2.015	-2.255	-0.477	0.620	-1.533
	(1.702)	(1.869)	(1.810)	(1.788)	(1.656)	(2.231)	(1.790)
Inflation	5.24e-05*	8.87e-05**	2.49e-05	2.47e-05	4.27e-05*	4.83e-05	-1.78e-05
	(2.63e-05)	(4.14e-05)	(3.99e-05)	(2.54e-05)	(2.48e-05)	(3.79e-05)	(3.34e-05)
Labour	0.0999**	0.0215	0.0931**	0.0983**	0.0845*	0.149**	0.101**
	(0.0484)	(0.0375)	(0.0413)	(0.0426)	(0.0443)	(0.0555)	(0.0473)
Middle	2.989	10.30***	3.617	1.101	2.177	-2.631	0.101
	(3.927)	(2.531)	(3.868)	(5.158)	(4.023)	(4.513)	(3.489)
GE*middle		12.04***					
		(3.971)					
PS*middle			-1.123				
			(2.550)				
RL*middle				-5.226			
				(4.561)			
VA*middle					1.746		
					(3.879)		
CC*middle						-2.624	
						(2.642)	
RQ-*middle							0.600
							(3.309)
Observations	420	420	420	420	420	420	420
Number of ID	35	35	35	35	35	35	35

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusion

The main objective was to examine the effect of institutional quality on output in SSA. Additionally, the paper examined significant regional differences in the effect of institutional quality on output in SSA. Lastly, the study analysed if the effect of institutional quality on output varies with income level of SSA countries. Two step systems GMM was preferred since it provides consistent estimates when faced with the problem of endogeneity. The findings showed that an improvement on institutional quality positively and significantly improve SSA output. The disaggregated analysis indicates that the six indicators of institutional quality (government effectiveness, political stability, rule of law, voice and accountability, control of corruption and regulatory quality) have positive and significant effects on economic growth in SSA. The findings further provide evidence that the effect of institutional quality on output varies with regional location of SSA countries. In particular, institutional qualities are more effective in driving income growth in West African region than the other three regions. Lastly, the findings suggest that the impact of government effectiveness on output growth varies with income level of SSA countries. In particular, government effectiveness contributes more to income growth in middle income countries than in low income SSA countries.

SSA countries should create statutory bodies that determine and prosecute economic crime. This would work towards combating incidences of corruption. Equally, participatory decision-making processes and transparency need to be adopted, and dissemination of information to the citizens. This would improve institutional quality and hence enhance income level. Understanding the regional difference in the effect of institutional quality output is equally significant to policy makers. This is because different countries require different set of institutions and policies to promote long run income level. Each region should adopt joint strategies that strengthen institutional quality. African regions should support African agendas that are aligning with global development agenda. These policies should widen democratic space, civil liberty and the participation of citizen in the development agenda of a country.

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