INSTITUTIONAL QUALITY, FISCAL POLICY AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

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Abstract

This study examined the impact of institutional quality and fiscal policy represented by Country Policy Institutional Assessment indicators, Total government expenditure and tax. The study applied the Pooled OLS to the data sourced from World Development Indicators (WDI) and Country Policy Institutional Assessment (CPIA) for the period of 2005 to 2020. The study found that institutional quality is negative and significant to economic growth in Sub-Saharan African Countries. This implies that institutional quality is significant to economic growth but the values of the Country Policy Institutional Assessment indicators have been negatively significant from 2005 to 2020 in Sub-Saharan African Countries. This study also found fiscal policy to be positively significant to economic growth in Sub-Saharan African Countries. This implies that a unit increase in Total government expenditure will result in a 0.5289 to 1.5074 increase in Gross Domestic Product per Capita, while a unit increase in tax will result in a 0.3127 to 1.3088 increase in Gross Domestic Product per Capita. The study concludes that the state of institutional quality is crucial to the advancement of economic growth in

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Sub-Saharan African Countries as it would prevent corruption and the implementation of ineffective policies.

Keywords: Economic growth; fiscal policy; institutions

1. Introduction

Productivity increases are caused by technological advancements and institutions (North, 1991). Institutions determine the extent to which those in power can expropriate the economy's resources to their advantage. . Huntington (1980) explained institutions as stable, valued, recurring patterns of behavior. He describes it as mechanisms that govern the behavior of a set of individuals within a given community and are associated with a common goal beyond individuals and intentions by mediating the laws that govern living behaviors.

In a market economy, institutions are the government's infrastructure (Lio and Liu, 2008). As a result, the strength of these institutions influences the quality of policies adopted. Government effectiveness, corruption control, the rule of law, voice and accountability, political stability, and regulatory quality are among these dimensions (Kaufman, Kraay and Mastruzzi, 2005). Fiscal policy is the process in which a government adjusts its spending and tax rates in order to track and influence the economy of a country. Price stability, exchange rate stability, the balance of payments equilibrium and economic growth are the most important macroeconomic objectives that the government focus on (Blanchard, 2009). Fiscal policy is used to stimulate economic growth and reduce inflation and it aims to stabilise economic growth by avoiding boom and bust economic cycle.

There are three variables of economic growth. It is about good leadership, firm policies, and strong institutions. Any two of the three combinations will still result in a certain amount of growth. But when institutions are weak, whatever growth is achieved, it is not sustainable and will eventually return to zero (Rewane, 2019).

There have been multiple works of literature on economic growth over the years. However, despite the criticality of the sector, promoting economic growth and development of the continent has been declining for years, specifically in Sub-Saharan Africa. Most of these studies (Lawal *et al.*, 2022; Omoju, Oladunjoye, Olanrele & Lawal, 2020; Lio & Liu, 2008). conclude that the main difference in productivity among various regions results from institutional heterogeneities. These studies conclude that poor institutions will form a barrier to human and physical capital accumulation. According to Easterly (2013), effective public services are a key component of high-quality institutions. He contends that legal and political rights

are ineffective in developing countries when they are confronted with inadequate public services.

The widespread assumption is that third-world countries' ongoing underdevelopment, particularly in Sub-Saharan Africa, results from institutional failure (Siba, 2008; Aderemi *et al*., 2020). It has been debated that economic policies will have little impact in any environment characterised by weak institutions no matter how formulated it is. In an environment characterised by low morale and ethical standards, along with weak institutions, it would be difficult to enforce contracts, protect property rights, and business contracts, ensure adequate and timely dissemination of information to economic agents, and ensure transparency and accountability.

Several studies have argued that the slow growth rate associated with African economies could have alluded to the peculiar nature of its environment, while others have discussed that the unsustainable nature of Africa's macroeconomic performance reflects the weakness of its institutions (Aderemi, 2019; Sachs and Warner, 1997; Acemoglu et al., 2003a; Easterly and Levine, 2001; Guisan, 2009; Mahmud, 2009; Olanipekun *et al*., 2022; Jayanti and Sushit, 2015; Barro, 2013). However, despite the increase in literature on the role of institutions on economic growth, most of these studies concentrated on a specific country as a case study over time, and little on panel data analysis has been presented in general literature. Thus, this study sought to look at this issue with relevant questions: What is the impact of institutional quality on economic growth in Sub-Saharan Africa? What is the effect *of fiscal policy on economic growth in Sub-Saharan Africa?*

The rest of the paper is captured as follows; the next section dwells on institutional quality and fiscal policy literature. The third section deals with data and methods of analysis, while section four presents results and discussion of findings. The last section provides policy implications.

1. Empirical Literature

The role of institutions in economic growth has attracted several empirical studies with mixed results using panel data, cross-sectional data, and time-series data. Some studies were based on either single countries or several countries. However, these studies have found little evidence to support the arguments that have been made in the past decade. Nabila and Shazia, and Muhammad (2015) examined the impact of institutional quality on economic growth in developing economies of Asia. The

study used Panel ARDL for the period African Journal of Economic Review, Volume VIII, issue I, January 2020, 1990 to 2013. The finding shows that institutional quality positively influences economic growth and causality running between institutional quality and economic growth.

Radzeviča and Bulderberga (2018)examine the role of institutional quality in economic growth: implications for the Baltic states. From 2006 to 2016, the study used the Generalised Method of Moments on a panel of 13 countries. Economic growth is enhanced by government effectiveness, regulatory quality, tax load, financial freedom, trade freedom, auditing and reporting standards, company board effectiveness, and investor protection.

Yildirim and Gokalp (2016) analyse Turkey's institutions and economic performance: a review of developing countries. The country used the panel data analysis method from 2000 to 2011. The findings suggest that institutional variables such as the legal system's integrity, trade barrier rules, foreign investment restrictions, and the private sector's share of the banking system positively impact macroeconomic performance. The macroeconomic performance is negatively impacted by judicial independence, government spending, transfers and subsidies, the black market exchange rate, civil liberties, collective bargaining, and political stability.

Chukwuma and Aldo (2013) Examined several macroeconomic indicators and concluded that they support the fact that African countries experienced increased growth rates due to good policy design leading to macroeconomic stability. Although it is beneficial, the growth pace is unsustainable. For example, the growth rate between 2000 and 2011 was 9.61 percent in 2004 and 4.38 percent in 2011. (World Bank, 2013). Despite a series of macroeconomic policies and structural changes, the entire Sub-Saharan region's unsustainable growth pattern reveals a mixed relationship between policy designs and African economic performance.

The perspectives of 'institutions as rules of the game' and 'institutions as governance quality were combined by Knack and Keefer (1995). They looked at how two different institutional quality indexes affect economic success, contract feasibility, risk of nationalisation, the rule of law, and other indicators. The 'institutions as governance quality' index are based on indicators such as bureaucratic quality, corruption, and bureaucratic delays, among others. According to the authors, institutions that defend property rights are important determinants of economic growth. The data set includes information from the World Values Survey for 29 nations. Over the 1980-92 period, the authors investigate the impact of disparities in

trust and civic cooperation norms on investment/GDP ratios and GDP per capita growth rates. They discover that civic cooperation and trust positively correlate with per capita GDP growth rates. A ten-percentage-point rise in the trust variable is linked to a 0.8-percentage-point increase in GDP per capita growth.

In South Asian countries, Ali, Irum, and Ali (2008) used annual time series data from 1990 to 2007 to analyse the effects of fiscal and monetary policy on economic growth. An autoregressive distributed lag (ARDL) model was used. The findings show that money supply has a considerable and positive impact on economic growth in both the short and long run. In contrast, fiscal policy has a negligible effect on economic growth in the short and long terms. In the case of South Asian countries, they conclude that monetary policy is a more powerful weapon than fiscal policy in boosting economic growth. Using time-series data from 1981 to 2009, Jawaid, Qadri, and Ali (2011) empirically assessed the effect of monetary, fiscal, and trade policy on economic development in Pakistan. Money supply, government spending, and trade openness are employed as proxies for monetary, fiscal, and trade policy. The co-integration and error correction model indicate a substantial positive long-run and short-run relationship between monetary and fiscal policy and economic growth. The results similarly show that monetary policy is more effective than fiscal policy in Pakistan.

Adefeso and Mobolaji (2010) investigate the relative effectiveness of fiscal and monetary policies on Nigerian economic growth. The data used is annual time series data from 1970 to 2007. The study employed an error-correcting mechanism and a co-integration technique. The study looked at the gross domestic output, broad money, government spending, and degree of openness. The findings show that monetary policy has a far more significant impact on economic growth in Nigeria than fiscal policy. They suggested that policymakers focus on monetary policy to achieve financial stability in Nigeria. Taban (2010) uses quarterly data from 1987:Q1 to 2006:Q4 to re-examine the government spending-economic growth nexus for the Turkish economy using a limit testing approach and MWALD Granger causality test. The findings show that in the long run, the share of total government spending and the percentage of government investment in GDP has a considerable and negative impact on real per capita growth. Government consumer spending to GDP ratio, on the other hand, does not affect per capita production growth. The findings also reveal a bidirectional causal relationship between total government spending and economic growth and a unidirectional relationship between per capita output growth and government investment to GDP ratio.

2. Methodology

2.1. Data and Model specification

Data for the study was sourced from the Country Policy Institutional Assessment (CPIA) and the World Development Indicators (WDI) of the World Bank from 2005 to 2020. This research hinges on the growing percentage of literature on the subject matter of institutional quality, and its effect on fiscal policy. In a bid to study the effect of institutional quality on fiscal policy in Sub-Saharan African countries, this research adopted variables from Cobb-Douglass production function to capture the relationship which is an offset of the endogenous growth theory. Endogenous growth theory posits that economic growth is a function of factors within the economy which will be interpreted as economic growth is a function of institutional quality and fiscal policy. The Cobb-Douglass production function will be adopted as the model as labor and capital are endogenous factors.

$$Q = AK^{\alpha} L^{\beta} \quad (1)$$

The equation describes how that output is directly influenced by the factors of production, namely labour and capital, while other aspects can be explained by an endogenous variable, 'A' (technology).

The above equation is a non-linear function and linearising the equation will be shown in equation 2.

$$Y = A + a\,K + \beta\,L \quad (2)$$

Equation (2) expresses the same relationship between the independent variables and the dependent variable, gross domestic product per capita (Y). However, the relationship between a dependent variable and its independent variables is not exact in econometric modelling.

We thereby augment equation 2 to get equation 3 where we introduce 'it' because of the panel nature of the work.

$$GDPPC_{it} = c + \alpha\, INS_{it} + \sigma TGEX_{it} + \theta TAX_{it}\ \upsilon GFCF_{it} + \chi TLF_{it} + \xi TEC + \mu_i + \jmath_t + \varepsilon_{it} \quad (3)$$

Equation (2) is converted into an econometric model, with a stochastic error term, a constant (represented by *A* in equation (2), and object and time dimensions (3).

Where: Y= GDPPC = (Gross Domestic Product per Capita), INS = Institutions, TGEX = Total Government expenditure, TAX = Tax, GFCF = Gross fixed capital formation,

TLF = Total labor force, TEC = Technology and εit = error term that incorporates other variables not included in the model.

Table 1. Variable Measurement

S/N	Variable	Label	Measurement	Source
1	Institutions	INS	PCA index of the six institutional dimensions and social protection	Country Policy and Institutional Assessment, World Bank, 2020
2	Total Government expenditure	TGEX	Total Government Expenditure	World Development Indicators (WDI), world Bank,2020
3	Tax	TAX	Tax	World Development Indicators (WDI), world Bank,2020
4	Gross fixed capital formation	GFCF	Gross Capital Formation	World Development Indicators (WDI), world Bank,2020
5	Total labor force	TLF	Total Labor Force	World Development Indicators (WDI), world Bank,2020
6	Technology	TEC	Individuals using the internet	World Development Indicators (WDI), world Bank,2020

2.2. Estimation Technique

Pooled OLS Pooled OLS cross-section coefficients contain information about average differences between units.

$$E[y_{it} \mid x_{it}] = y_{it} = x'_{it}\beta + \alpha + \varepsilon_{it} \quad (4)$$

This is a population-averaged effect as yit may enter through the variance i.e. repeated observation on individual i is linearly independent. The OLS estimates α and β are consistently evaluated. However, even if estimation is consistent, pooled OLS may not be efficient. This is because it does not exploit the autocorrelation in the composite error term. A strategy is to combine pooled OLS with cluster-consistent standard errors. However, before ruling out pooled OLS, it is important to test for the appropriateness of panel methods vs. pooled OLS.

Random Effect Model is the variance between entities that is considered to be spontaneous and uncorrelated with the independent variable in random effects. Rather than measuring the differences in values between levels, it is more interested in drawing inferences about the distribution of values. The model parameters are random variables, and it's also known as a variance factor model. If it is believed that differences between individuals affect the dependent variable, then the random

effect model must be used. The random effect model has an advantage over the fixed effect model and the pooled OLS in that it allows the time-invariant variable to be added up.

$$Y_{ij} = \mu + U_i + W_{ij} \quad (5)$$

Where μ = Average institutional quality among the countries

Ui = Country specific random effect

Wij = Individual specific random effect

Fixed Effect Model is a model in which Individual-specific effects are assumed to be linked to the independent variable in the fixed-effect model. Individual variables are consistent; however, these variables do not change or shift at a constant rate over time. This is in contrast to the random effect paradigm. Since they have predetermined effects, any change they cause in an individual is the same. Fixed-effect analysis can only support a hypothesis based on the set of measures available. Unobserved variables may have little to no relationship with observed variables in a fixed-effect model. When you use a fixed impact, you're accounting for the average variations in either measurable or unobservable indicators throughout countries. The fixed effects methods are said to be inefficient as they may lose information in the process.

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \quad (6)$$

Where:

Yit is the dependent variable observed for an individual country I at time t.

Xit is the time-variant (the number of independent variables) regressor vector.

β1 is the slope parameters.

αi is the unobserved time-invariant individual effect.

$u$it is the error term.

If the Hausman test rejects the null hypothesis, the fixed effect is still consistent. The random-effect model, on the other hand, is contradictory, so the fixed-effect model is preferred. If the Hausman test rejects the alternative hypothesis, it means that both the fixed and random effects are consistent, and the random effect is successful, meaning that the random effect model is favoured.

3. Results and Discussions

3.1. Summary Statistics and Correlation Analysis

This section presents the result and discussion of findings. The result for this summary statistics is presented in Table 2, while the correlation result for the test of multicollinearity is presented in Table 3. The summary statistics in Table 2 show that Sub-Saharan African countries have an average Gross Domestic Product per capita of $2479 during the period. The minimum and maximum values are at about $163 and $10810 respectively. The mean value for Gross Fixed Capital Formation (GFCF) is about 25% and the minimum and maximum values are about 11% and 81% respectively. The mean value for Total Government Expenditure (TGEX) is about 19% and the minimum and maximum values are about 8% and 39% respectively.

The mean value for Tax is 35% and the minimum and maximum values are 7% and 85% respectively. This means that for the panel series, the least amount of taxes collected in a country is 7% and the highest amount of taxes collected is 85%. The mean value for Total Labour Force is about 12.7 million and the minimum and maximum values are 415,781 and about 62.3 million respectively. The mean value for technology (TEC) is about 17%. This means that Sub-Saharan African countries have about 17% of total internet users on an average time period. The minimum and maximum values are about 22% and 84% respectively.

The mean index for Voice and Accountability (VA) is about 0.5307 and the minimum and maximum indexes are about 0.17 and 0.83, respectively. The mean index for Political Stability and Violence (PV) is about 0.6698 and the minimum and maximum indexes are 0.4 and 0.89 respectively. The mean index for Government Effectiveness (GE) is about 0.3299. This means that Sub-Saharan African countries had poor government effectiveness on average during this time period. The minimum and maximum indexes are 0 and 0.63 respectively.

The mean index for Regulatory Quality (RQ) is about 0.6163 and the minimum and maximum indexes are 0.36 and 0.95 respectively. The mean index for Rule of Law (RL) is about 0.5246 and the minimum and maximum indexes are 0.33 and 0.83 respectively. The mean index for Control of Corruption (CC) is about 0.3513. This means that Sub-Saharan African countries have poor control of corruption on average during this period. The minimum and maximum indexes are 0.08 and 0.67 respectively. The mean index for Institutions (INS) is about 1.05 and the minimum and maximum indexes are about -2.65 and 2.16 respectively.

Table 2. Summary Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
GDPPC	352	2478.7900	2331.8150	162.4327	10809.6800
GFCF	342	24.6600	8.5423	10.5226	81.0210
TGEX	278	18.9641	7.6976	7.6931	38.6081
TAX	262	35.0147	15.3360	7.1004	85.1440
TLF	352	1.27e+07	1.33e+07	415781	6.23e+07
TEC	337	17.2322	18.2035	0.2196	84.1203
VA	352	0.5307	0.1896	0.1700	0.8300
PV	352	0.6697	0.1016	0.4000	0.8900
GE	352	0.3299	0.1762	0	0.6300
RQ	352	0.6163	0.1043	0.3600	0.9500
RL	352	0.5246	0.1673	0.3300	0.8300
CC	352	0.3513	0.1200	0.0800	0.6700
INS	352	1.0509	1.0000	-2.6536	2.1662

The estimates for the test of multicollinearity are presented in Table 3. Table 3 reveals that there is no excessive linear correlation among regressors. All variables in the model are ≤ 0.75. which means there is no high incidence of multi-collinearity however, this still shows that the model is suitable for further study because the correlation between these variables is expected and accounted for.

Table 3. Correlation Analysis

	GDPPC	GFCF	TGEX	TAX	TLF	TEC	VA	PV	GE	RQ	RL	CC	INS
GDPPC	1.0000												
GFCF	0.0512	1.0000											
TGEX	0.7522	0.0054	1.0000										
TAX	0.5319	0.1244	0.5559	1.0000									
TLF	-0.1797	-0.0546	-0.2107	-0.1434	1.0000								
TEC	0.5413	-0.0569	0.4817	0.2642	0.0612	1.0000							
VA	0.0386	-0.1048	0.4003	-0.1034	-0.2169	0.1683	1.0000						
PV	0.3433	0.1743	0.4924	0.2694	-0.5670	-0.0612	0.4751	1.0000					
GE	0.2674	0.1020	0.4367	0.2171	-0.0866	0.2940	0.5564	0.4875	1.0000				
RQ	0.2376	0.1292	0.3219	0.0860	-0.3739	0.0444	0.4451	0.5754	0.4241	1.0000			
RL	0.1773	0.1605	0.4098	0.1214	0.0229	0.2206	0.3576	0.3941	0.2705	0.2088	1.0000		
CC	0.2180	0.0460	0.3221	-0.0320	-0.2822	0.1871	0.4998	0.4148	0.3456	0.3931	0.3035	1.0000	
INS	0.3433	0.1743	0.4924	0.2694	-0.5670	-0.0612	0.4751	1.0000	0.4875	0.5754	0.3941	0.4148	1.0000

4.2 Econometric Results

4.2.1 Pooled OLS

The result of the Pooled OLS is presented in Table 4. The model has a goodness of fit which is represented by an R2 of ≤ 85%. The R2 indicates that gross fixed capital formation, total government expenditure, tax, total labor force, technology, voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption and institutions account for ≤ 85% of the variations in gross domestic product per capita.

The coefficients of Government expenditure are statistically significant at 1% level. There exists a positive relationship between the variable and gross domestic product per capita. This means that a unit increase in Government expenditure, holding other variables constant, will result in a 0.5289 to 1.5074 increase in gross domestic product per capita i.e. if government expenditure increases by a single dollar, gross domestic product per capita will grow by 0.5289 to 1.5704 units.

The coefficients of tax are statistically significant at 1%. There exists a positive relationship between the variable and gross domestic product per capita. This means

that a unit increase in tax, holding other variables constant, will result in a 0.3127 to 1.3088 increase in gross domestic product per capita i.e. if tax increases by a single dollar, gross domestic product per capita will grow by 0.3127 to 1.3088 units.

The coefficients of total labour force are statistically significant at 1%. There exists a negative relationship between the variable and gross domestic product per capita. This means that a unit increase in total labour force, holding other variables constant, will result in a 0.1642 to 0.3284 decrease in gross domestic product per capita i.e. if the labour force increases by a single unit, gross domestic product per capita will fall by 0.1642 to 0.3284 units.

The coefficients of technology are statistically significant at 1%. There exists a positive relationship between the variable and gross domestic product per capita. This means that a unit increase in technology, holding other variables constant, will result in a 0.1956 to 0.3513 increase in gross domestic product per capita i.e. if technology increases by a single unit, gross domestic product per capita will grow by 0.1956 to 0.3513 units.

The coefficient of voice and accountability is statistically significant at 1%. There exists negative relationship between the variable and gross domestic product per capita. This means that a unit increase in voice and accountability, holding other variables constant will result in a 1.0501 decrease in gross domestic product per capita i.e. if voice and accountability increases by a single index, gross domestic product per capita will fall by 1.0501 units.

The coefficient of political stability is statistically significant at 1%. There exists a negative relationship between the variable and gross domestic product per capita. This means that a unit increase in political stability, holding other variables constant will result in a 1.0817 decrease in gross domestic product per capita i.e. if political stability increases by a single index, gross domestic product per capita will fall by 1.0817 units.

The coefficient of government effectiveness is statistically significant at 1%. There exists a negative relationship between the variable and gross domestic product per capita. This means that a unit increase in government effectiveness, holding other variables constant will result in a 0.7052 decrease in gross domestic product per capita i.e. if government effectiveness increases by a single index, gross domestic product per capita will fall by 0.7052 units.

The coefficient of regulatory quality is statistically significant at 5%. There exists a negative relationship between the variable and gross domestic product per capita.

This means that a unit increase in regulatory quality, holding other variables constant will result in a 0.4356 decrease in gross domestic product per capita i.e. if regulatory quality increases by a single index, gross domestic product per capita will fall by 0.4356 units.

The coefficient of rule of law is statistically significant at 1%. There exists a negative relationship between the variable and gross domestic product per capita. This means that a unit increase in rule of law, holding other variables constant will result in a 0.4765 decrease in gross domestic product per capita i.e. if rule of law increases by a single index, gross domestic product per capita will fall by 0.4756 units.

The coefficient of control of corruption is statistically significant at 1%. There exists a negative relationship between the variable and gross domestic product per capita. This means that a unit increase in control of corruption, holding other variables constant will result in a 0.4707 decrease in gross domestic product per capita i.e. if control of corruption increases by a single index, gross domestic product per capita will fall by 0.4707 units.

Institutions and gross fixed capital formation are the variables that are not statistically significant in the model, and they all have p-values greater than 0.05.

From the results, it was shown that all the variables met the 'a priori' expectation asides from Total Labour Force which showed a negative relationship with gross domestic product per capita. This implies that for Sub-Saharan African countries, institutional quality is necessary. Fiscal policy instruments have a positive relationship with gross domestic product per capita as expected from the a priori expectation. This means that increasing total government expenditure and tax will boost gross domestic product per capita.

The results are supported by the findings of various previous studies, although, in different countries and regions differ, the findings still align. The results of Omar (2018), Ocran (2011), Shaw (2016), Nguyen and Luong, (2021), Canh, Thong and Thai, (2017), Ishaku, Ugbaka, and Mbang (2021), Abubakar (2020), and Chang (2011) show that historical and recent researches show that institutional quality and fiscal policy have positive relationships with gross domestic product per capita.

Gross domestic product per capita in all econometric results but is significant in pooled OLS. Total labour force being negative can be explained by stating that total labour force consists of all persons who meet the requirement of employment. This means that it consists of employed and unemployed individuals. SSA countries have a long history of unemployment which means unemployment is more than

employment. This helps proves the result that states an increase in total labour force by a unit reduces gross domestic product per capita by the same unit.

Table 4.

	1	2	3	4	5	6	7
Constant	5.5781* (0.000)	5.2690* (0.000)	5.5231* (0.000)	5.4504* (0.000)	5.6100* (0.000)	4.4863* (0.000)	5.4486* (0.000)
Gross Fixed Capital Formation	0.1132 (0.284)	-0.1350 (0.153)	0.0049 (0.966)	-0.0496 (0.672)	-0.0085 (0.941)	0.6638 (0.567)	-0.0168 (0.881)
Total Government Expenditure	0.5289* (0.000)	1.5074* (0.000)	1.1213* (0.000)	1.0266* (0.000)	1.0180* (0.000)	1.1152* (0.000)	1.0629* (0.000)
Tax	1.3088* (0.000)	0.0279 (0.747)	0.4047* (0.000)	0.3587* (0.000)	0.3440* (0.001)	0.3470* (0.000)	0.3127* (0.000)
Total Labor Force	-0.3284* (0.000)	-0.1999* (0.000)	-0.2331* (0.000)	-0.2248* (0.000)	-0.1949* (0.000)	-0.1642* (0.000)	-0.2019* (0.000)
Technology	0.1956* (0.000)	0.2855* (0.000)	0.2363* (0.000)	0.3513* (0.000)	0.2713* (0.000)	0.2740* (0.000)	0.2732* (0.000)
Institutions	-0.0140 (0.561)						
Voice and Accountability		-1.0501* (0.000)					
Political Stability			-1.0817* (0.004)				
Government Effectiveness				-0.7052* (0.000)			
Regulatory Quality					-0.4356** (0.048)		
Rule of Law						-0.4765* (0.000)	
Control of Corruption							-0.4707* (0.000)
R. Squared	0.8530	0.7968	0.7010	0.7418	0.6953	0.7082	0.7085
Adjusted R. Squared	0.8464	0.7917	0.6934	0.7340	0.6875	0.7007	0.7011
Prob	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: The p-values are in parentis (), *, **, and ***, means that the coefficient is significant at 1%, 5% and 10% respectively. The variables are all in their logarithm forms.

4.2.2 Random Effects Model

The variance between entities is considered spontaneous and uncorrelated with the independent variable in random effects. Rather than measuring the differences in values between levels, it is more interested in drawing inferences about the distribution of values. The model parameters are random variables, also known as a variance factor model.

The model has a goodness of fit, which an R2 of ≥ 46% represents. The R2 indicates that Gross Fixed Capital Formation, Total Government Expenditure, Tax, Total Labor Force, Technology, Institutions, Control of Corruption, Government Effectiveness, Political Stability and Violence, Regulatory Quality, Rule of Law, and Voice and Accountability account for > 46% of variations in Gross Domestic Product per Capita. The probability of the Wald chi2 is 0.000, which indicates that the variables in the model are jointly significant.

Tax coefficients are statistically significant at 5% and 10% levels. There exists a positive relationship between the variable and GDP per capita. This means a unit increase in Government Revenue, holding other variables constant, will result in a 0.2256 to 0.3218 increase in GDP per capita, i.e. if Government Revenue increases by a dollar, GDP per capita will grow by 0.2256 to 0.3218 units.

Total Labour force coefficients are statistically significant at 1% and 5% levels. There is a negative relationship between the variable and GDP per capita. This means a unit increase in Total Labour Force, holding all other variables constant, will result in a 0.3080 to 0.3715 decrease in GDP per capita, i.e. if Total Labour Force increases by a single unit, GDP per capita will fall by 0.3080 to 0.3715 units.

The coefficients of Technology are statistically significant at a 1% level. There is a positive relationship between the variable and GDP per capita. This means a unit increase in Technology, holding all other variables constant, will result in a 0.1698 to 0.2417 increase in GDP per capita, i.e. if Technology increases by a single unit, GDP per capita will grow by 0.1698 to 0.2417 units.

The coefficients of Voice and Accountability are statistically significant at a 1% level. There is a negative relationship between the variable and GDP per capita. This means a unit increase in Voice and Accountability, holding all other variables constant, will result in a 0.3758 decrease in GDP per capita, i.e. if Voice and Accountability increases by a single index, GDP per capita falls by 0.3758 units.

Gross Fixed Capital Formation, Government Expenditure, Institutions, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption are the variables that are not statistically significant in the model.

Table 5. Random Effects Model

Variable	1	2	3	4	5	6	7
Fixed Capital	0.0981 (0.290)	0.1382** (0.016)	0.0934 (0.168)	0.0994 (0.172)	0.0966 (0.136)	0.0922 (0.134)	0.0891 (0.178)
Government Expenditure	0.0796 (0.735)	0.0602 (0.719)	0.0051 (0.979)	0.0118 (0.952)	0.0035 (0.986)	0.0201 (0.919)	-0.0092 (0.964)
Tax	0.3218** (0.034)	0.2256*** (0.087)	0.2525** (0.047)	0.2498 (0.107)	0.24809*** (0.056)	0.2611** (0.037)	0.2358** (0.033)
Labor Force	-0.3715* (0.007)	-0.3243* (0.003)	-0.3012* (0.009)	-0.3250* (0.005)	-0.3289* (0.002)	-0.3264* (0.004)	-0.3080** (0.012)
Technology	0.2417* (0.000)	0.1890* (0.000)	0.1809* (0.000)	0.1842* (0.000)	0.1735* (0.000)	0.1698* (0.000)	0.1732* (0.000)
Institutions	0.0109 (0.391)						
Voice and Accountability		-0.3758* (0.010)					
Political Stability			0.2371 (0.303)				
Government Effectiveness				0.0235 (0.912)			
Regulatory Quality					-0.0352 (0.783)		
Rule of Law						-0.2173 (0.401)	
Control of Corruption							0.1076 (0.278)

Variables	1	2	3	4	5	6	7
Constant	11.0802* (0.000)	10.4648* (0.000)	10.6942* (0.000)	11.0079* (0.000)	11.0409* (0.000)	10.8005* (0.000)	10.9507* (0.000)
R^2	0.6577	0.5115	0.4765	0.4774	0.4667	0.4675	0.4723
Group/ Observation	16/141	22/242	22/242	19/207	22/242	22/242	22/242
Wald chi2	177.27 (0.000)	135.14 (0.000)	100.05 (0.000)	71.02 (0.000)	166.84 (0.000)	112.11 (0.000)	114.93 (0.000)

Note: The p-values are in the parentis (), *, ** and ***, which means that the coefficient is significant at 1%, 5% and 10% levels, respectfully, and the variables are all in their logarithm forms

Hausman Test

H0: Random effects are independent of explanatory variables.

H1: H0 is not true.

If the p-value is statistically significant i.e. less than 0.05, we reject the null hypothesis, and the fixed effects model will be adopted for the study. However, if the p-value is not statistically significant, we refuse to reject the null hypothesis and the random effects model is used. The figure below explains the decisive processes of the Hausman test. Since the p-value is statistically significant i.e. less than 0.05, we reject the null hypothesis and adopt the fixed effects model for our analysis.

4.2.3 Fixed Effects Model

The fixed effects model was computed because it was chosen over random effects model by Hausman test.

Based on the results of the Hausman test, the results interpreted below are the results of the fixed-effects model.

The model has a goodness of fit of ≥ 44%. The R2 indicates that Gross Fixed Capital Formation, Total Government Expenditure, Tax, Total Labor force, Technology, Institutions, Voice and Accountability, Political Stability and Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption account for ≥ 44% of the variations in Gross Domestic Product per Capita. The F-test is 0.000 which indicates that the variables in the model are jointly significant.

Some of the coefficients of Gross Fixed Capital Formation are statistically significant at 5% and 10% levels. There exists a positive relationship between the variable and Gross Domestic Product per Capita. This means a unit increase in Gross Fixed Capital Formation, holding other variables constant, will result in a 0.1026 to 0.1666 increase in Gross Domestic Product per Capita i.e. if Gross Fixed Capital Formation increases by a single dollar, Gross Domestic Product per Capita will grow by 0.1026 to 0.1666 units.

Some of the coefficients of Tax are statistically significant at 10% level. There exists a positive relationship between the variable and Gross Domestic Product per Capita. This means a unit increase in Tax, holding other variables constant, will result in a 0.1604 and 0.2424 increase in Gross Domestic Product per Capita i.e. if Tax increases

by a single dollar, Gross Domestic Product per Capita will grow by 0.1604 to 0.2424 units.

The coefficients of Technology are statistically significant at 1% and 5% levels. There exists a positive relationship between the variable and Gross Domestic Product per Capita. This means a unit increase in Technology, holding other variables constant, will result in a 0.1657 to 0.2753 increase in Gross Domestic Product per Capita i.e. if Technology increases by a single unit, Gross Domestic Product per Capita will grow by 0.1657 to 0.2753 units.

The coefficient of Voice and Accountability is statistically significant at a 5% level. There exists a negative relationship between the variable and Gross Domestic Product per Capita. This means that a unit increase in Voice and Accountability, holding other variables constant, will result in a 0.3928 decrease in Gross Domestic Product per Capita i.e. if Voice and Accountability increases by a single index, Gross Domestic Product per Capita will fall by 0.3928 units.

Government Expenditure, Total Labour Force, Institutions, Political Stability and Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption that is not statistically significant in the model, as they all have p-values that are greater than 0.05.

Table 6. Fixed Effects Model

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Constant	16.1124 (0.122)	9.9029*** (0.083)	11.0880 (0.109)	15.3441*** (0.068)	12.5135** (0.038)	11.4601*** (0.083)	10.3965 (0.131)
Hausman	0.0000						
R^2	0.5153	0.5026	0.4646	0.4400	0.4632	0.4672	0.4740
Group/Observation	16/141	22/242	22/242	19/207	22/242	22/242	22/242
F-test	16.89 (0.000)	33.40 (0.000)	20.40 (0.000)	21.35 (0.000)	32.29 (0.000)	28.84 (0.000)	27.12 (0.000)

Variable	1	2	3	4	5	6	7
Total Government Expenditure	-0.0440 (0.854)	-0.0224 (0.899)	-0.0499 (0.805)	-0.0636 (0.755)	-0.0588 (0.775)	-0.0401 (0.845)	-0.0668 (0.754)
Tax	0.1604 (0.426)	0.1866 (0.199)	0.2391 (0.108)	0.2207 (0.232)	0.2279 (0.127)	0.2424*** (0.096)	0.2161*** (0.086)
Total Labor Force	-0.6513 (0.336)	-0.2677 (0.480)	-0.3164 (0.481)	-0.5867 (0.279)	-0.4110 (0.291)	-0.3575 (0.405)	-0.2581 (0.572)
Technology	0.2753** (0.021)	0.1813* (0.000)	0.1783* (0.001)	0.2069* (0.001)	0.1788* (0.000)	0.1692* (0.001)	0.1657* (0.001)
Institutions	0.0097 (0.501)						
Voice and Accountability		-0.3928** (0.018)					
Political Stability			0.2016 (0.431)				
Government Effectiveness				0.0886 (0.745)			
Regulatory Quality					-0.0594 (0.626)		
Rule of Law						-0.2694 (0.435)	
Control of Corruption							0.1198 (0.270)

Note: The p-values are in the parentis (), *, ** and ***, which means that the coefficient is significant at 1%, 5% and 10% levels, respectfully, and the variables are all in their logarithm forms.

5. Conclusion and Recommendations

Beyond the usual state of instability, good institutional quality is crucial for efficient fiscal policy in Sub-Saharan African countries, as discovered in the study. Poor institutional quality leads to a corrupt economy with less efficient fiscal policies and regulations detrimental to economic growth. It is essential that institutional quality should be pursued. The countries studied include Angola, Botswana, Burkina Faso, Cameroon, Congo, Cote d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Madagascar, Mali, Morocco, Mozambique, Namibia, Nigeria, Sudan, South Africa, Tanzania, Togo, Tunisia and Uganda for the period between 2005 to 2020. The panel data analysis was balanced. The study adopted the fixed effects after conducting the Hausman test but was not considered because of the p-values of the variables. The pooled OLS was then used. Institutional quality was significant but had a negative relationship with economic growth. However, tax was significant and had a positive relationship with economic growth.

This study has extensively covered the relationship between institutional quality and economic growth and between fiscal policy and economic growth in Sub-Saharan African countries. It was discovered during this study that institutional quality and total labour force had a negative impact on economic growth in these countries though they were significant. This was explained as a result of poor institutional quality in Sub-Saharan African countries and a lack of good governance and political stability. The state of institutional quality is crucial to the advancement of economic growth in these countries as it would prevent corruption and the implementation of ineffective policies that result in poor levels of economic growth. However, fiscal policy and technology showed a positive relationship in these countries.

To assure advances in economic growth across sub-Saharan African countries, policymakers, the government and all relevant stakeholders must take the necessary steps to improve institutional quality. The recommendations also place responsibility on the government, international authorities, and agencies to ensure that institutional quality is improved throughout these countries and that productivity in all sectors of the economy.

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