



Rethinking of Government Institutions and Governance Quality Indicators on Economic Growth in Sub-Saharan African Countries

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Abstract

The study aims to investigate the effect of governance quality on economic growth and government consumption in Sub-Saharan African countries. Balanced dynamic panel data for 36 Sub-Saharan African countries from 2011 to 2022 were analyzed using GMM and Driscoll-Kraay regressions. In addition to the fact that there is no study in the literature that examines the effect of state governance indicators on economic growth in SSA countries, the addition of government consumption variable as a second dependent variable adds originality to the study. The empirical analysis revealed that government institutions have a positive effect and are significant in SSA countries' economic growth. In addition, according to the Driscoll-Kraay regression, it is seen that governments' development of institutions increases government consumptions. The governance indicators threshold that strengthens the government institution in Sub-Sahara Africa must be reached to increase the economic growth of Sub-Sahara Africa. For economic growth, effective government institutions and governance quality policies should be practiced and maintained among the Sub-Saharan African countries.

Keywords Economic growth · Government consumptions · Governance quality · GMM · Driscoll-Kraay regression

Highlights

- Balanced dynamic panel data for 36 Sub-Saharan African countries from 2011 to 2022 were analyzed using the GMM and Driscoll-Kraay regressions.
- Unlike other studies, the government consumption variable as a second dependent variable adds originality to the study.
- The empirical analysis revealed that government institutions have a positive effect and are significant on SSA countries' economic growth.
- The governance indicators threshold that strengthens the government institution in Sub-Sahara Africa must be reached in order to increase the economic growth of Sub-Saharan African countries.
- For good economic growth, effective government institutions and governance quality policies should be practiced and maintained among the Sub-Saharan African countries.

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Introduction

The sluggishness and decline of economic growth in Sub-Saharan African countries created great attention among economic scholars exacerbating to investigation of the nature and effect of economic growth in Sub-Saharan African countries (World Bank, 2023). For instance, in 2020 Sub-Sahara Africa's economic growth contracted to -1.99% and then expanded to 4.1% in 2021; further, it contracted again to 3.6% in 2021 (International Monetary Fund, 2022). Despite the macro and microeconomic indicators affecting the economic growth of SSA countries, the government institutions and governance quality indicators affect the economic growth of SSA countries (Knack & Keefer, 1995). The macroeconomic indicators like physical investments, human capital investment, and working labor do not explain real economic growth without intervening in the institutionalization of government and good governance institutions. Therefore, government institutions and good governance inclusivity have significant roles in delivering effective quality that determines and enhances the economic growth in SSA countries (Wandeda et al., 2021; Stiglitz, 1998; Stein, 1994; Aron, 2000). Effective government and good governance institutions enhance economic growth and government consumption while the weak government and governance institutions hamper it (Aron, 2000). Growth data of the SSA countries are presented in the Appendix (Table 9). While corporate governance effectiveness supports growth, this growth situation of countries also leads to some negative effects such as increased energy use and disproportionate migration (Kartal et al., 2023). More energy use will also trigger environmental pollution (Ayhan et al., 2023). The SSA's GDP has been declining for several years; however, the decline of economic growth in SSA has contributed to multiple factors, including the Ukrainian and Russian war that caused energy crises and distortion of food security supply, innovation, and technological transformation in the industrialization sectors, inadequate government institutions, and less effective governance within the economic integration (Allais, 2022).

This article, unlike other studies, investigates the impact of government good governance institutions on economic growth and government consumption in Sub-Saharan countries. Thus, this study uses government effectiveness, control of corruption in government, non-violent political stability, rule of law, and quality regulations as indicators of good governance institutions of the government. From the analysis results, it can be seen that the government management quality index has an impact on both government consumption and economic growth in SSA countries. Also, the impact of government expenditures on the GDP has prevailed great attention in modern economics in a way that politicians and economists try to figure out in the context that government expenditures affect GDP. The Keynesian multiplier demonstrates that the economy will flourish as the government increases spending (Pigou, 1936). The multiplier effect of government expenditure is an unprecedented strategy and an important instrument to increase economic growth (Bista & Sankhi, 2022). Government spending leads to cycles of economic prosperity and increased employment, raising gross domestic product to levels higher than the cost (Robinson, 1977; Landau, 1983; Ram, 1986; Barro, 1991; Devarajan et al., 1996; Ghali, 1999; Al-Yousif, 2000, Dalamagas, 2000; Fölster & Henrekson, 2001).

Literature shows that government expenditures on human development skills (HD) have a bi-causal relationship between economic growth and HD (Ranis et al., 2000). Improvement of human development skills provide a better environment for human beings to manage economic activities well such as improving the agriculture sectors, creating well infrastructure networking, and building capital formation which are more productive in the interim to generate income that positively has a positive effect on economic growth (Escosura, 2010). Government effectiveness provides quality policy to enhance and protect the countries' economic growth by providing regulations and laws that determine the integrity of government commitment to its stated policy (Hall & Jones, 1999).

It enhances market efficiency by enforcing property rights, helping the private sector drive the economy by quickening capital formation, and directing resources to the respected sectors, especially where the market equilibrium is inactive (Alam et al., 2017). An effective government might not regularly work without political stability within economic integration. In his recent article, David Brady et al. (2022) articulates the correlation between rising political instability and declining economic growth so that countries with electro-volatility experienced low average economic growth. More specifically, it affects the growth share, encouraging capital flight and discouraging foreign capital from flowing. The political instability extends in SSA, destroying the production from industries and increasing the economic trends' unemployment rate (Mbaku, 1992). Global Peace Index 2023 in Economics indicates five of ten countries, including the Central African Republic, the Democratic Republic of Congo (DRC), Sudan, Somalia, and South Sudan. Furthermore, Burkinafaso, Mali, Nigeria, and Somalia are the countries that were affected by political instability and violence (GPI, 2022). Nonetheless, there is a correlation between political stability, the absence of violence, and the rule of law on economic growth (Androniceanu et al., 2022). The rule of laws in economic growth creates a framework for securing private and individual rights that creates predictability and stability of economic growth as necessary to promote investment savings, entrepreneurship, and capital formation (Isanga, 2010). Acemoglu et al. (2003) clarified that institutional quality is the key to reforms in the economic growth of any developing country (Akinlo & Okunlola, 2021). Thus, effective economic growth is driven by regulation, the rule of law, and transparency. Surely, the economy's growth goes where it is welcome and stays where it is treated well by implementing regulations and quality (Sen & Te Velde, 2009). For better economic growth, the regulations should protect property rights by providing a stable long-term favorable environment for economic growth. With this slowing down of economic trend in SSA, different studies turned to scrutinizing the impact of government institutions and governance that influence the economic growth of SSA. However, sufficient empirical studies are not widely describing the determinant of declining economic growth in SSA countries; apart from that, a few studies have been conducted in SSA countries compared to Europe and Asia continents (Han et al., 2014). Therefore, more political and macroeconomic associating factors should be observed when investigating the decline of economic growth contrary to the monetary policy implementation of SSA countries. Thus, this study uses five proxies of governance indicators and two government institutions to measure the effect of declining economic growth in SSA

countries (Qutb & Shennawy, 2016). The study aims to rethink state institutions and governance indicators for economic growth and government consumption in SSA countries using GMM and Driscoll-Kraay robust estimator methods. In addition to the fact that there is no study in the literature that examines the effect of state governance indicators on economic growth in SSA countries, the addition of government consumption variable as a second dependent variable adds originality to the study.

The study seeks answers to two questions. First, do government institutions and governance indicators affect economic growth? Secondly, do government institutions and governance indicators affect government consumption? According to the analysis result, well-designed government institutions and governance indicators impact both economic growth and government consumption in SSA countries.

The article is organized as follows: the “[Review of Literature](#)” section is related to a review of different thoughts and arguments from the scholars, and the “[Methodology](#)” section discusses the methodology and outline of the data that has been represented and the model specification issues. The “[Results and Discussion](#)” section is related to the findings, and the “[Conclusions and Policy Recommendations](#)” section is related to the conclusion and policy recommendation.

Review of Literature

This section reviews the thoughts and empirical studies on the impact of government institutions and governance indicators on economic growth and government consumption of SSA countries. The section has two phases: the first is related to thoughts or theories from different scholars, and the rest is related to empirical studies underpinning the examination of the effect of government institutions and good governance indicators on economic growth and government consumption of SSA countries. The debate between government institutions and governance institutions on economic growth and government consumption of SSA countries’ paradigm creates great tension among scholars. Effective governance institutions operate to enhance economic growth through institutional quality, implementing the rule of laws, corruption pervasiveness, risk of expropriation, and repudiation in the investment contract. Thus, the ability of low-income countries to catch up with the frontier countries from an economic perspective is governed by strong, effective governance and strong government institutions (Keefer & Knack, 1997).

Further, Dollar and Kraay (2003) believe that effective institutions which are well structured and designed stimulate productive behaviors for market enhancement, while those that are figured inefficient lead to unproductive behaviors in the economic trend. Quality and effective institutions reduce economic uncertainties and transaction costs in the economic path as they coordinate between economic agents. Contrary, the absence of intellectual property rights and the existence of weak enforcement in investment may impede GDP (North, 1993). The literature discussion is primarily based on proxies of government institutions and governance on GDP. Hence, proxies of government institutions include government spending and

tax revenues, while proxies of governance comprise government corruption control, political stability without violence, and the rule of laws and regulations.

Early neoclassical theory predicted that poor countries would grow faster than wealthy countries because of the diminishing returns to capital in the upcomings as continued. Reverse has occurred as the economic growth of developing countries is falling back rather than catching up with the higher dynamic state. The divergence that exists mostly in developing countries, including SSA countries, occurs due to the less effective government institutions. According to Knack and Keefer (1995), who examined the outcome of government institutions on economic growth, strong government institutions and good governance institutions are central to the growth of the economy. The theory offers strong support in that effective government institutions are the vital instrument for economic growth in SSA countries. Moreover, the upshot of the effective government institutions on economic growth persists even after controlling for investment, but the case in Sub Sahara Africa looks different from 2007 to 2022 which causes the decline of economic growth in SSA countries.

The proxies of governance institutions on economic growth start with government effectiveness: Yasu (2021) investigates the government's effectiveness on economic growth. First, he explained that the government's effectiveness is significant in terms of institutional and sustainability aspects. The findings from the study revealed that strong institutions lead to effective government and an effective government results in economic growth performance. In a study on a group of countries similar to this paper, Fayissa and Nsiah (2013) used fixed and random effects and Arellano-Bond models. Their results suggest that good governance supports economic growth in African countries. For post-socialist economies, Alexiou et al. (2020) stated that economic growth is positively associated with the rule of law and voice and accountability. Afonso and Rodrigues (2022) investigated the impact of corruption and economic growth in SSA countries. The outcome of the empirical analysis revealed that bribery hurts economic growth. Song et al. (2021) investigated corruption's impact on financial institutions' economic growth, and they found that the impact of corruption in financial institutions can be found in the long run. Forson et al. (2017) state that corruption threatens economic development; therefore, strong institutions should work together to eliminate the rate of corruption within the states. The recent economic models revealed that good governance influences the country's economic growth performance. Good governance comprises the rule of laws, regulations of quality services, political stability, and the absence of violence in the country. Therefore, studies pinpoint that good governance positively impacts a country's economic growth in SSA countries. A survey by Nguyen et al. (2021) in Vietnam justifies that good governance improves public services and reduces poverty. Generally, the reviews from the studies find that good governance policy impacts economic growth. The effectiveness of implementing the governance policies provides a stable macroeconomic environment and minimizes economic uncertainties, leading to an increase in economic growth in SSA countries.

Beyene (2022) analyzed the role of governance quality in influencing economic growth in 22 selected Sub-Saharan African countries. Similar to our study, the panel dynamics generalized method of moments (GMM) was applied to analyze data obtained from the World Bank database from 2002 to 2020. The overall finding

showed that the governance quality index has a positive and significant impact on the economic growth of countries. Here, one unit improvement in the total governance index leads to a 3.05% increase in GDP.

Farooque et al. (2022) used cross-country panel data for 40 Sub-Saharan and Middle East and North Africa (MENA) countries for the period 2009–2020. Empirical results document the positive effects of the national governance index on the economic growth rate. The findings of the dynamic system GMM model show that the governance index has a significant positive impact on the GDP growth rate at the 1% significance level. For each unit increase in the governance index, the growth rate of the economy will increase by 3.04 points.

Bekana (2023) used a dataset from 45 African countries for the period 1996–2018. He studied the impact of the quality of governance on the development of the financial sector. For this purpose, four groups of governance quality indicators (i.e., general, political, economic, and institutional) variables were used. These four governance quality indicators also have a positive impact on economic growth.

Saidi and Ochi (2023) examined the triangular relationship between foreign direct investment (FDI), economic growth, and governance quality for 102 developing countries, including African countries. In the study, governance quality was measured as the average of six indicators. These indicators are control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and voice and accountability. Estimated results from system-GMM estimations confirm the positive impact of foreign direct investment and governance quality on the economic growth process. In another study, Ochi et al. (2023) examined the relationship between governance quality and economic growth for 54 African countries during 1996–2019. The results proved that the link between governance quality and economic growth is non-linear. Additionally, a statistically positive relationship was detected between governance quality and economic growth above the 0.2 threshold level. Above this threshold, the quality of governance began to increase the per capita GDP growth rate in African countries.

Although there are many studies examining the impact of governance quality on economic growth, the number of studies examining the relationship between governance quality and government expenditures is limited. These limited studies cover the hypothesis of government spending driven by governance quality. Here, good governance institutions provide confidence that government funds are being used well and encourage higher government spending. Good governance institutions prevent market failures such as rent-seeking and moral hazard problems. If we look at it from a negative perspective, it will cause the government to hesitate to make large expenditures in the economy due to concerns about inadequate monitoring systems and a lack of due diligence processes (Arvin et al., 2021).

Keefer and Knack (2007) investigated a similar relationship. Results showed that public spending is higher in countries with poor quality governance, limited political checks and balances, or a lack of competitive elections. Rajkumar and Swaroop (2008) investigated the impact on public health expenditure in the

presence of different levels of governance quality. They reported that good governance improves the impact of public expenditure. In countries with good governance, the share of public expenditures in GDP is increasing.

Rodríguez-Pose and Garcilazo (2015) investigated the quality of governance by correlating expenditures of the European Union Structural and Cohesion Funds. A two-way fixed-effect panel regression model was performed for a total of 169 European regions over the period 1996–2007. The results of the analysis reveal the importance of governance quality, both as a direct determinant of economic growth and as a regulator of the efficiency of structural and cohesion funds expenditures.

Dizaji et al.'s (2016) aim of their study is to examine how the quality of political institutions shapes the state's behavior toward the allocation of public expenditures between military and other social expenditures. They focused on the Iranian case to measure the size and importance of political institutions in the government's military and non-military spending behavior. It showed that the impact of the quality of democratic institutions in Iran on military spending was negative and statistically significant over the next 3 years. On the contrary, education spending responded positively to a positive shock to democratization. This shock remains statistically significant for the first 4 years and reaches its maximum in the second year after the shock.

Thanh et al. (2020) examined the role of economic governance in the relationship between public expenditures, private investments, and economic growth in sixty-two provinces of Vietnam for the period 2006–2015. The quality of economic governance plays a critical role in improving the impact of government spending. The quality of governance has been found to have a positive impact on economic growth. It was determined that provinces with low levels of governance quality were less productive and could not achieve economic growth. The results show that good governance, characterized by features such as transparency, greater accountability, and impartial policy, has a positive impact on public expenditure and private investment across Vietnamese provinces.

Arvin et al. (2021) examined the interactions between institutional quality, government expenditures, tax revenues, and economic growth in low-income countries (LICs) and lower-middle-income countries (LMICs). The results showed that institutional quality, public expenditures, tax revenues, and economic growth have internal links with each other in the short run.

There are studies that empirically examine the relationship between government consumption and economic growth. Gngoin et al. (2019) examines the relationship between public expenditures, income inequality, and economic growth with robust difference-GMM estimation and panel Granger causality test using a sample of 19 Asian countries between 2002 and 2017. Current government consumption reduces economic growth. Moreover, government spending on education and regulatory quality Granger cause economic growth in these countries. However, the effect of government spending on education on economic growth is not significant. Therefore, the study recommends the governments of these countries to promote gross domestic investment, maintain regulatory quality, and reduce current consumption in order to increase their economic growth. Odhiambo (2021) sought to scrutinize the upshot of government expenditure and economic growth in SSA from

2006 to 2018. He used the panel data of 35 SSA countries. The investigation of this research adopted the two-step system GMM analysis. The findings from the empirical analysis revealed that public expenditures like health, education, and infrastructure are key determinants of the economic growth of SSA countries. Syofya (2022) analyses economic growth and factors affecting economic growth in Asia in the period 2000–2019 using dynamic panels. The study uses the GMM system method in modeling economic growth using the human development index (HDI), change in exports (PEXPORT), and government expenditures (EXPENGOV) as independent variables. The change in export (PEXPORT) variable and government expenditure (EXPENGOV) have a positive and significant effect on economic growth in Asia. Prakoso (2020) investigates the short- and long-term relationship between government size and economic growth in 57 Organisation of Islamic Cooperation member countries over the period 2010–2018 using the dynamic data panel method GMM Arellano-Bond. The results show that in the short run, government size has a negative and significant effect on economic growth, while government investment has a positive and significant effect on economic growth. It also shows that in the long run, the size of government has a negative and significant effect on economic growth, while government investment has a positive and significant effect on economic growth. Laboure and Taugourdeau (2018) show that there is a strong relationship between the level of development of 147 countries (31 low-, 69 middle-, and 47 high-income countries) and the amount of public spending. They explain their findings using dynamic panel GMM estimators with data covering the period 1970–2008. Productive spending has a large impact on growth in poor countries. Thanh (2014) investigates the impact of provincial government size on economic growth using the panel data of 60 provinces in Vietnam for the period 1997–2012. He uses the difference generalized method of moments (GMM) method proposed by Arellano and Bond (1991) and the pooled mean-group method proposed by Pesaran, Shin et al. The findings show that an increase in the share of government expenditure and government revenue slows economic growth, while real government expenditure per capita and real government revenue per capita are positively related to economic growth. Kimaro et al. (2017) analyze the impact of public spending and productivity on the economic growth of low-income countries in Sub-Saharan Africa. In the study, they use panel data of 25 Sub-Saharan African low-income countries covering the years 2002–2015 obtained from the World Development Indicators (WDI) database. They apply panel unit root tests using Im-Pesaran-Shin and Fisher ADF tests, Pedroni test, and generalized method of moments (GMM) to perform panel cointegration tests. The results show that increased public expenditure accelerates the economic growth of low-income countries in Sub-Saharan Africa. Some studies have proven that trade openness (Pata et al., 2023; Zohonogo, 2016) and globalization (Hadiatou, 2010) are effective in influencing economic growth for Sub-Saharan African countries.

The number of studies investigating the impact of state governance indicators on economic growth in SSA countries is quite limited. In addition to the fact that there is no study in the literature that examines the effect of state governance indicators on economic growth in SSA countries, the addition of government consumption variable as a second dependent variable adds originality to the study. Also, PCA analysis

for the impact of governance quality on economic growth and governmental consumption adds originality to the current study.

Methodology

The study investigated the impact of corporate governance quality on the country's growth rate and government consumption in Sub-Saharan African countries between 2009 and 2022. The community of Sub-Saharan African countries consists of 49 countries (Republic of Turkey Ministry of Foreign Affairs, 2023); however, 17 of these countries were not included in the sample because their data was not available within the period of the study. The countries included in the study are given in the Appendix (Table 10).

It seems that interest in Sub-Saharan African countries has increased toward the 2000s. Because especially for developed countries with high production volumes, the richness of Sub-Saharan African countries in various raw materials and oil and mineral deposits in some countries in the region increases the importance of this country group. Having rich natural resources has become an area of interest for many countries such as China, USA, EU, Russia, France, Japan, and India due to international political relations (Tepebaş, 2007).

The variables used in the study are as follows:

Governance Quality Index refers to government effectiveness (Gov In). It is described as the content that comprises the quality and standard of public services, the excellence of civil services, public policy's value, and the government's credibility for providing those policies to the communities (Ciesielska et al., 2022). The government consumption refers to the household consumption of goods and services derived from government institutions for public use (Victor & Leyira, 2021) (Table 1).

Good governance significantly impacts economic growth, especially in the economic integration of SSA countries. Government corruption control refers to an existing government responsible for controlling and minimizing the rate of corruption in both the public and private sectors (Lassou et al., 2021). The stability of politics and absence of violation is the proxy of good governance. Once it has been effectively established and maintained in the economic region, it causes the availability of peace and security in the economic region (Kaufmann et al., 2010). The rule of law is an instrument that states everyone should be equal under the law. The laws should define and respect fundamental human rights. The rule of law shapes the citizens' property rights, patent rights, and capital investment toward mega economic performance. The rule of law means establishing strong institutions that can work to protect human rights within the economic region (Mahmood et al., 2021). The last instrument is regulatory equality (Lee et al., 2021). Every country has been measured using the governance indicators, which vary from -2.5 up to 2.5 with zero at the center so that the positive sign indicates effective governance. The negative sign shows that the higher positive value is correlated with ineffective, higher, or quality governance performance, and the negative sign represents weak governance functioning. Principal components analysis (PCA) checking derived

Table 1 Variables used in the study

	Abb	Variables	References
Dependent variables	GDP	Gross domestic product	World Development Indicators
	Cons	Government consumption	
Independent variable	Government	Government effectiveness	
	Politics	Political stability	
	Rule	Rule of law	
	Regulatory	Regulatory quality	
	Control	Control of corruption	
		Governance Quality Index (Gov IN)	

the composite governance index (CGI) from the six governance proxies. The GDP stands as an independent variable that influences government institutions and the good governance of Sub-Saharan Africa.

Since two different dependent variables are used, two different models are formed. Five different components for the corporate governance quality of countries were considered and turned into a single variable with PCA. The results obtained while deriving the index for principal component analysis are given in Table 2.

The essence of the principal component analysis method is to derive a small number of variables instead of many variables. Thanks to this method, solutions are provided to both cross-sectional dependency and multivariate problems between variables, minimizing the information loss of respected data (Jolliffe, 2002). With PCA, dimensionality reduction and interpretation are provided by explaining the variance–covariance structure of a data set consisting of variables and the linear combinations of the variables (Yıldız et al., 2010). With this analysis, p new variables defining the p -dimensional space are derived. The unit of the basic components is not obtained. The main purpose is to explain the information loaded on p variables with k ($k \leq p$) new variables (Alpar, 2011). In this study, the effects of 5 variables that will show the dimensions of the state's corporate governance quality on both GDP and government consumption variables were examined. However, the fact that these variables look at the quality of state administration from only one window due to their own characteristics and that the 5 variables are close to each other and interact are not fully sufficient to explain their effect on the dependent variables in both models (Yücel, 2009). For this reason, principal component analysis was used to show the cumulative effect of all variables on the independent variables.

GMM (generalized method of moments) technique was used in the study because it has some advantages in terms of its content. In terms of method content, it was used for both models because the dependent variables do not have lagged values; it solves the endogeneity problem, it captures country-specific, unobserved heterogeneities, the variables can show dynamic effects depending on the period, the country cross-section (n) is higher than the time cross-section (t), and it does not take into account the stationarity and cross-section dependence of the series. Because if fixed/random

Table 2 Results of principal analysis component (PCA)

Governance indicators	Factors loading				
	Comp1	Comp 2	Comp 3	Comp 4	Comp 5
Government effectiveness	0.4656	-0.2235	0.2572	0.7035	-0.4151
Government corruption control	0.4513	-0.0781	-0.8494	0.1235	0.2313
Politic stability and absence of violation	0.3854	0.9024	0.1562	0.0373	0.1064
Rule of laws	0.4715	-0.1101	0.0114	-0.6777	-0.5533
Regulations and quality	0.4568	-0.3427	0.4335	-0.1709	0.6758
Eigenvalue	4.2521	0.446419	0.176258	0.070549	0.054669
Proportional variation	0.8504	0.0893	0.0353	0.0141	0.0109
Cumulative variation	0.8504	0.9397	0.9750	0.9891	1.0000

effects methods were used instead of dynamic panel analysis, the results would be inconsistent since the dependent variables are associated with the error term (Coşkun & Kök, 2011; Béjaoui & Bouzgarrou, 2014; Büyükoğlu et al., 2022).

Thus, the GMM model initiated by Blundell and Bond (1998) is much more effective than similar panel data models. The GMM model apprehends the issues connected with the country and time's particular impacts by cooperating with regressors' lagged value and equation-level instruments to address the endogeneity problem. However, Arellano and Bond (1991) used the first difference equation to solve the specific country effect using the GMM model. However, the outcome from the result revealed that the first difference equation generates the endogeneity bias due to the existence of the regressor. Mohammed (2020) argued that the difference in the first equation suffered from the weak instrument caused by the persistence of the large data. Therefore, two steps of the sys-GMM for government institution proxies and good governance indicators on the GDP of SSA were introduced to overcome this condition. The two-step sys-GMM is accounted for because it is more appropriately structured to manage the challenges of the less strong instruments, and it deals with issues of unobserved impact and endogeneity problems. The two-step system GMM has been introduced to control the possible existence of endogeneity, heteroscedasticity, and omitted variables. Thus, the two-step sys-GMM uses the GDP lagged 1 to estimate the results.

The basic models created in the study are as follows:

$$GDP = \beta_0 + \beta_1 GDP(-1)_{i,t-1} + \beta_2 Gov In_{i,t} + \varepsilon_1 \quad (1)$$

$$Cons = \beta_0 + \beta_1 Cons(-1)_{i,t-1} + \beta_2 Gov In_{i,t} + \varepsilon_1 \quad (2)$$

In the first model, GDP is the dependent variable, GDP is the growth rate of the countries, GDP (-1) is the lagged value of the dependent variable, and Gov In is the corporate governance quality of the countries; in the second model, Cons is the dependent variable, Cons is the government consumption amount of the countries, Cons (-1) is the lagged value of the dependent variable, Gov In is the corporate governance quality of the countries, and ε is the error term.

If there are cross-sectional dependence, heteroscedasticity, and autocorrelation problems among the variables, Parks-Kmenta, panel corrected standard errors (PCSE) and Driscoll-Kraay estimators can be used. However, the Driscoll-Kraay estimator gives better results when $n > t$ compared to other tests (Driscoll & Kraay, 1998; Hoechle, 2007).

Results and Discussion

When Table 3 is examined, the high standard deviation value, especially in GDP and government consumption values, in sub-Saharan countries shows that there are differences between countries. Pre-estimation analysis of the proxy variables starts with descriptive statistics, as represented in Table 3. The average mean growth pattern of Sub-Saharan African countries is about 3,845,493. Apart from COVID-19

and the SSA government's national debt, surely, the growth rate of SSA is much affected due to good governance and unstable government institutions, which created a large economic divergence among the SSA countries, especially the violence and civil war that were taking place in the Democratic Republic of Congo, Somalia, Sudan, Central Africa, and Ethiopia.

The represented results are well recommended through the growth of SSA by examining the years from 2011 to 2022; therefore, the SSA should take advantage of establishing effective government institutions and good governance toward establishing the rule of laws, reducing the corruption rate, maintaining the rate of patents by establishing a regulatory quality and maintaining effective government institutions.

As seen in Table 4, there are both cross-sectional dependency and heteroscedasticity problems in both models with both GDP and government consumption variables. There is no autocorrelation problem in Model-1, but there is an autocorrelation problem in Model-2. It seems that there is a heteroscedasticity problem in both models.

Looking at the CADF unit root test results, the GDP variable is stationary at level (I(0)), while the Cons and GIQ variables are not stationary at level and contain unit roots. CIPS unit root test also supports CADF unit root test results on a model basis. In other words, according to the CIPS unit root test results, while Model-1 is stationary at the level, Model-2 is not stationary at the level, it contains a unit root (Table 5).

According to the difference in GMM results in Table 6, the governance quality index of countries has an impact on GDP at a 5% significance level. There is a directly proportional relationship. One unit increase in the management quality of countries increases their growth rates by 3.91 units.

However, in model 2, the probability percentage shows that there is no effect. Moreover, according to the system results, there is no significant relationship in both models.

According to the results of Table 7, it is seen that the management quality of the countries has a strong effect on their government consumption at the 1% significance level. A 1-unit increase in the management quality of countries increases their government consumption by 2.58 units. This shows that as the corporate governance quality of countries increases, citizens' trust in the country's administration increases, and their government consumption increases.

Increasing the corporate governance quality of countries will increase their growth rates because investments will be made more professionally and expenses will be optimal. A correct production and savings policy in the country will increase

Table 3 Statistical values of variables

Variables	Obs	Mean	Std. dev	Min	Max
GDP	544	3.845493	4.539109	-36.39198	21.07901
Cons	544	14.62311	7.265632	2.736065	43.48379
GIQ	544	-5.21011	1.000002	-1.485742	2.582021

Table 4 Diagnostic tests of variables

Model	Pesaran's test of cross-sectional independence		Wooldridge test for autocorrelation in panel data		Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
	Stat	Prob	Stat	Prob	chi2(1)	Prob
Model-1 (GDP)	21.964	0.0000	1.132	0.2955	22.41	0.0000
Model-2 (Cons)	3.364	0.0008	115.639	0.0000	31.20	0.0000

the growth rates of countries positively. The government expenditure on the public sector has a complementary effect on the private sector as it is properly reallocated to improving public goods such as standard and quality education services, well-improved and reliable health services, infrastructure networking, and defense services (World Bank, 2023).

Table 5 Unit root test results

Variables	CADF	Critic values			Position	
		%10	%5	%1		
CADF	GDP	-2.521	-2.030	-2.110	-2.250	I (0)
	Cons	-2.008	-2.030	-2.110	-2.250	I (1)
	GIQ	-1.658	-2.030	-2.110	-2.250	I (1)
CIPS	Model-1	-3.172	-2.03	-2.11	-2.25	I (0)
	Model-2	-2.026	-2.03	-2.11	-2.25	I (1)

Table 6 GMM results (independent variables as a single index)

	Diff. GMM				System GMM			
	Model-1		Model-2		Model-1		Model-2	
	Coef	Prob	Coef	Prob	Coef	Prob	Coef	Prob
GDP (-1)	0.1590915	0.001			0.1344018	0.000		
Cons (-1)			0.6343153	0.000			0.8238936	0.000
Gov IN	3.914648	0.013	-0.8032592	0.142	1.138291	0.106	0.5712674	0.163
Cons	3.132174	0.000	5.444526	0.000	3.230275	0.000	2.676993	0.000
Wald	20.33 (0.0000)		181.75 (0.0000)		17.70 (0.0001)		833.26 (0.0000)	
Hansen	0.46 (0.499)		0.39 (1.0000)		1.68 (0.092)		0.87 (1.0000)	
AR1	0.0007		0.0001		0.0008		0.0000	
AR2	0.3310		0.0741		0.2236		0.0786	

Table 7 Driscoll-Kraay standard errors

	Model-1		Model-2	
	Coef	Prob	Coef	Prob
Gov IN	0.3264785	0.205	2.584519	0.000
Cons	3.845493	0.000	14.62311	0.000
<i>F</i> (1,16) test	1.74 (0.2052)		157.68 (0.0000)	
Root MSE	4.5315		6.7967	
Number of Obs	544			

Conclusions and Policy Recommendations

The article investigated the impact of government institutions and governance toward the economic growth and government consumption of Sub-Saharan Africa. The World Development Indicators and Worldwide-Governance Indicators were used as the secondary data access for the investigation of the impact of the government institutions and good governance indicators on the economic growth and government consumption of Sub-Saharan African countries. It selected 32 SSA states to be investigated using the dynamic panel data. As econometric methods, GMM and Driscoll-Kraay techniques were applied in Sub-Saharan African countries. This article contributes to the literature by investigating the impact of government institutions of good governance on economic growth and government consumption in sub-Saharan countries.

The findings revealed that government institutions and governance affect the economic growth of SSA. Empirical analysis shows that 1% of government spending has an effect of increasing SSA's economic growth by 3.91% according to the GMM. In addition, according to the Driscoll-Kraay method, the management quality of countries has a positive effect on their expenditures. One unit change in government spending increases countries' consumption by 2.58 units. The results are supported by the Keynesian school, which believes that as the prices keep somewhat rigid, the changes in government consumption, investment, and public government expenditures cause the output to fluctuate. For instance, if public government spending increases in the public sector and other components are kept constant, then economic growth output will grow by a multiplier effect (Blinder, 2008). SSA should improve the growth of the economy within the region by providing a good and quality education in the communities that produce advanced technology and innovation, implementing the quality of public health services that reduce the mortality rate, and improving the infrastructure that connects one region to another across the SSA regions.

According to the GMM method, the quality of governance of Sub-Saharan African countries has an impact on economic growth, while according to the Driscoll Kraay method, the quality of governance of Sub-Saharan African countries has an impact on government expenditures. In fact, most of the government expenditure budget in some African countries is allocated for military and security purposes instead of allocating to public services as the means of improving sustainable development project which leads to increasing the economic growth of Sub-Saharan African countries.

The Sub-Sahara African countries should improve the growth of the economy within the region by providing a good and quality education in the communities that produce advanced technology and innovation, implementing the quality of public health services that reduce the mortality rate, and improving the infrastructure that connects one region to another across of Sub-Saharan Africa countries.

Government effectiveness is associated with attaining a better quality of public services, attracting more investment, encouraging a higher level of human capital accumulation, putting foreign resources to better use, accelerating technology and innovation, and increasing the productivity of government spending. To increase the performance of the economic growth of Sub-Saharan countries, the government should focus more on the building government's institutional structure to reduce corruption within economic integration. Indeed, corruption undermines the government's effectiveness, compromises social trust in government policies, and weakens the quality of government institutions. Good governance invests in building strong institutions for the fight against corruption within the integrated institutions. These countries must seriously combat political stability and violence and prevent the political instability experienced in recent years from increasing the risk. The rule of law creates efficient strong institutions that resolve the economic uncertainties and improve the economic growth of Sub-Saharan African countries. In addition to that, the effective implementation of the rule of law prevents and controls the increasing rate of corruption within the Sub-Saharan African economic regions. As the previous results show, the inefficiency of government effectiveness and the government's low control of corruption are caused by the misapplication of the rule of law and, as a result, reduce the economic growth of SSA. The lesser performance of the regulations and quality is due to the difficulties of implementing the regulations and quality in the public and private sectors that ruin the performance of the economic growth of Sub-Saharan African countries. In general, government institutions and good governance significantly affect the economic growth of Sub-Saharan African countries. Although many efforts have been implemented to increase the economic growth of SSA countries, the SSA countries should establish strong government institutions that will be mandated to manage and control government expenditure toward public projects. The institutions will allocate the proper government spending to improve the economic growth of SSA countries. Government spending should focus on improving standard and quality education, public health, and networking infrastructures, which enable the SSA to increase the economic growth of Sub-Saharan African countries. Sub-Saharan African countries must establish good governance that enables quality and the rule of law within the

regions. Sub-Saharan Africa should make more effort to control and minimize the rate of corruption with economic integration. It should focus on reforming the rule of law and avoiding political instability within the economic regions.

Our results are in line with like of Keefer and Knack (2007), Rajkumar and Swaroop (2008), Yasu (2021), Beyene (2022), Farooque et al. (2022), and Bekana (2023). However, the results are opposite to the findings of Thanh (2014), Wilson (2016), and Prakoso (2020). The fact that not every country's data for this period is complete and the study is only applied to Sub-Saharan countries can be expressed as a limitation. The economic growth of SSA countries depends on many variables. For similar future studies, it is necessary to diversify the variables, expand the data set of the variables, and even use different analysis methods. Thus, it can be determined which variables are more effective in the economic growth of SSA countries.

Appendix

Table 8 Acronyms

GMM	Generalized method of moments
SSA	Sub-Sahara African countries
GDP	Gross domestic product
Coef	Coefficient
Prob	Probability
Gov In	Governance Quality Index
Obs	Observation
Std. Dev	Standard deviation
Stat	Statistics
PCA	Principal components analysis

Table 9 Sub-Saharan African GDP from 2005 to 2021

Year	GDP (billions of \$)	Growth rate (%)	Union ranking for economic growth	Union ranking of economic growth	Billions of \$
2022	—	3.8	World		96,100.09
2021	1917.90	4.1	OECD Members		57,920.17
2020	1706.09	-1.99	East Asia and the Pacific		30,880.83
2019	1792.08	2.55	European Union		17,088.67
2018	1832.71	2.69	Euro Area		14,493.21
2017	1704.40	2.45	Latin America		5,488.72
2016	1572.90	1.27	South-Asia		4,087.77
2015	1684.99	2.86	Sub-Saharan African		1,917.90
2014	1868.67	4.85			
2013	1804.73	5.05			
2012	1700.40	2.75			
2011	1635.06	4.18			
2010	1451.75	5.92			
2009	1226.02	3.04			
2008	1274.71	5.15			
2007	1121.96	6.15			
2006	968.22	6.06			
2005	821.32	6.00			

Source from Macrotrends/Sub-Saharan-Africa

Table 10 Countries included in the study

Angola	Lesotho
Benin	Madagascar
Botswana	Mali
Burkina Faso	Mauritius
Burundi	Mozambique
Cameroon	Namibia
Central African Republic	Niger
Chad	Nigeria
Comoros	Rwanda
Congo, Dem. Rep	Senegal
Equatorial Guinea	Sierra Leone
Gabon	South Africa
Gambia, The	Tanzania
Ghana	Togo
Guinea-Bissau	Uganda
Kenya	Congo, Rep

Data Availability The datasets used in analyses during the current study are available in the Databank repository, <https://databank.worldbank.org/source/world-development-indicators>. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

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