IMPACTS OF GOVERNANCE ON INVESTMENT CLIMATE IN SUB-SAHARA AFRICA

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Abstract
The multi-dimensional impacts of the investment climate in an economy make extensive research on how investment climate can be enhanced imperative. However, the extant literature on the role of governance on investment climate remains very shallow. This study, therefore, examines the impacts of governance on investment climate using a panel data set of 39 Sub-Saharan African (SSA) countries between 2015 and 2019. The study proxied investment climate with ease of doing business scores obtained using Distance to Frontier (DTF) methodology, while governance institutions were measured by the six clusters of governance produced by the World Bank. The six clusters of governance include government effectiveness, regulatory quality, control of corruption, rule of law, political stability and absence of violence, and voice and accountability. The results of the diagnostic tests indicate that the data violated the classical linear regression assumptions of homoscedasticity, exogeneity, no serial correlation, and normal distribution. As a result, the data were analyzed using panel feasible generalized least squares (FGLS) regression, which allows estimation of a panel regression in the presence of first-order serial correlation within panels, heteroscedasticity, and cross-sectional correlation across panels. Our panel FGLS results revealed a positive and significant impact of all the six clusters of governance on investment climate represented by the ease of doing business score in SSA. Government capacity (represented by government effectiveness and regulatory quality) was found to exert the greatest impact, followed by the respect of citizens and the state for the institutions (represented by control of corruption and the rule of law) and how the government is selected and replaced (represented by political stability and absence of violence, and voice and accountability). Therefore, the study recommends that SSA countries should endeavour to improve their governance in all its dimensions to improve their ranking in the ease of doing business and promote a better investment climate.

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Introduction

Improving the investment climate has become a major aspiration of developing countries, especially Sub-Saharan African countries. This may not be unconnected with its strategic role in the development of an economy. A relatively transparent, stable, and predictable investment climate is recognized to be essential for the attainment of developing countries' goals of low unemployment, poverty reduction, and improved societal welfare (Grohou & Soumane, 2011). An improvement in the investment climate will exert a multiplier effect on general investment. Through an increase in investment, a favourable investment climate can bring valuable technology that can help jump-start an economy (Nobakht & Madami, 2014) and foster the economic development of an emerging market (Masron & Abdullah, 2010). It can also help attain a diversified economic structure, one of the effects of which is an increase in tax revenue that is expected to result in a low level of poverty (Tambuna, 2014). The investment climate is the nucleus of economic growth and its presence fosters investment, innovation, and profitability, all of which benefit society at a macro level (Karama, 2014). Such an important role has resulted in a renewed and unabated interest in how it could be enhanced, especially in the developing world.

The state and nature of the investment climate are influenced by a variety of factors, including macroeconomic and political stability (Bota-Avram, 2014; Gaura & Padiya, 2017; Karama, 2014; Nageri & Gunu, 2020; Pollard, Piffault, & Shackman, 2013), physical infrastructure (Pollard et al., 2013), and the availability of capital and human resources (Ngobo, Gaura, & Padiya, 2012). Recently, studies have shown that good governance is capable of improving the investment climate in an economy. According to some studies, effective governance has a positive impact on and is a major determining factor for, the effectiveness of the business environment (Bota-Avram 2014; Gaura & Padiya 2017; Karama 2014). The influence of governance on the investment climate could be premised on the fact that an economy with moderate levels of bureaucracy, a higher concern for legislative compliance, and good instruments for controlling corruption is more likely to create and maintain a business environment that stimulates economic performance (Cule & Fulton 2013; Pollard, Piffault, & Shackman 2013).

The link between governance and the investment climate has been described in several quarters. By ensuring a more effective allocation of resources, governance not only positively influences the stimulation of economic growth but also the competitiveness of the business environment (Roman & Rountree, 2011). In addition, through the promotion of free-market policies, governance leads to a transparent environment for conducting public affairs and also influences economic prosperity (Ngobo & Founda, 2012). Also, good governance tends to bring about a framework of good rules that establish and clarify property rights, rules that are meant to enhance the predictability of economic interactions between various contractual partners (Bota-avram, 2014). Thus, good governance will ensure fair regulatory frameworks, accountability and transparent policy-making, all of which have a direct influence on business activity. Recent statistical evidence suggests that SSA countries are still characterized by poor public governance. Based on the data obtained from the World Bank World Development Indicators between 2015 and 2017, SSA countries recorded below-average performance in each of the six clusters of governance. In particular, it was found that on a measurement scale of between -2.5 and +2.5, SSA countries recorded -0.777, -0.659, -0.561, -0.673, -0.665 and -0.468 on each of the government effectiveness, control of corruption, political stability and absence of violence, regulatory quality, rule of law and voice and accountability respectively.

The Ease of Doing Business Index (EDBI), which measures the investment climate, indicates that African countries are far behind those of other countries in the world, especially industrialized countries. Recent data from the World Bank Development Indicators reveal that SSA countries recorded average ease of doing business score of 50.6 per cent between 2015 and 2019 implying that conducting business in Sub-Sahara Africa relative to other sub-regions remains hard. This is despite the commitment from the governments of Sub-Sahara African countries to improve the investment climate through an increase in the ease of doing business ranking. Nigeria, for instance, recently set up a Presidential Enabling Business Environment Council (PEBEC) and closely related steps have equally been taken by other countries in the region (United Nations Conference on Trade and Development, 2019). As a result, it has become critical to further investigate the determinants of the investment climate and galvanize them to achieve the goal of improving the investment climate in Sub-Saharan Africa. Given the potential role of governance in promoting a better investment climate, this study objective is therefore to investigate empirically whether governance influences the investment climate in Sub-Saharan African countries. Specifically, the study would examine if and how each of the six clusters of governance affects the ease of doing business score in SSA.

Even though few studies have already empirically investigated the impact of governance institutions on the investment climate, most of the studies are at country level or cross-country level using cross-sectional data (Bota-Avram, 2014; Karama, 2014; Pollard, Piffaut, & Shackman, 2013), except for Groşanu, Boţa-Avram, Răchişan, Vesselinov, and Tiron-Tudor (2015), whose study was a panel analysis in nature. The study by Groşanu *et al.* (2015) focused on 95 countries across the world, implying that existing literature has yet to consider SSA countries within the context of panel data. Also, none of the existing literature on governance and investment climate has used the ease of doing business score obtained from the distance to the frontier as a proxy for investment climate except Handoyo (2017) which used cross-sectional data of 188 countries. The contribution of this study is thus

to provide a comprehensive empirical analysis of the impact of governance on the investment climate in Sub-Saharan Africa using panel feasible generalized least square (FGLS) estimation techniques.

Based on the foregoing, this study is unique in three ways. The first is that it would be the first study, to the best of our knowledge, to use Distance to Frontier (henceforth, Dtf), which provides a time series dimension to the measure of ease of doing business as a measure of the investment climate. This makes it possible for us to use panel regression analysis, which has not been used in the previous work on the issue in SSA. The second is that we focus on Sub-Saharan Africa, a continent that has been mostly hit by bad governance and a harsh investment climate. We believe that this will help to provide a region-specific solution to the problem of the harsh and unfavourable investment climate in SSA. We believe that the findings of this study will further provide evidence on the link between investment climate and governance and also enable us to ascertain if earlier findings can stand further empirical scrutiny.

The rest of the paper is arranged as follows: The next section presents the theory and empirical evidence. Research methodology is presented in section three. Section four is devoted to the presentation and discussion of results, and Section five presents the conclusion.

Theory and empirical evidence

The link between the investment climate and governance institutions is supported by both theories and empirical evidence. The transaction cost theory, for instance, established that negotiation in business settings is accompanied by transaction costs such as those related to drawing up contracts and carrying out inspections, among others, and these costs, to a very large extent, influence whether a business transaction eventually takes place or not. Coarse, one of its proponents, argued that discussing the process of exchange makes little sense unless the institutional setting in which the business takes place is recognized because it influences the incentive to produce and the transaction costs. Thus, good governance reduces transaction costs and uncertainties by filling institutional voids.

Institution theory by North (1990) and Williamson (2000) also offers theoretical underpinnings for the relationship between institutions and the investment climate. The theoretical argument of the new institution theory is that by spelling out what is acceptable and what is not in written form, formal institutions lessen uncertainty as well as facilitate cost-efficient transactions. Wan's (2005) institutional-based theory of strategy and performance also lends credence to the theoretical argument in support of government institutions as a determinant of the investment climate. According to the theory, when institutions are strong, non-market capabilities such as lobbying and bureaucratic relationships will become less relevant in conducting business as the government's role in the economy wanes. Strong institutions affect the investment climate since they facilitate the development of market capability.

In terms of empirical studies, the extant literature on the impact of governance institutions on the investment climate remains very shallow. While few studies examine the relationship using prominent measures of governance and investment climate, a few others use related measures of governance and investment climate.

A few studies found that governance institutions have a positive and significant impact on investment climate, using six governance clusters and ease of doing business index to proxy governance and investment climate, respectively. In this category is Bota-Avram (2014), who used cross-sectional data of the world's countries classified into income groups to see the impact of income distribution as well as the relationship. He reported that the rule of law and control of corruption had an impact significantly on the business environment, and thus governance quality is relevant in promoting the ease of doing business, which results in effective development outcomes. Other studies which reported similar results include but are not limited to Karama (2014) for a sample of 178 countries using cross-sectional data; Grosanu et al. (2015) using cross-sectional time-series random effects Generalized Least Square (GLS) as well as Pollard, Piffaut, and Shackman (2013), who used Ordinal Logit (OLOGIT) but found no impact of control of corruption and voice and accountability on the ease of doing business.

Another extensive study was conducted by Rachsan, Bota-Avram and Grosanu (2017) covering 132 countries over the period 2007–2012 to examine the influence of country-level governance on the

investment climate via its influence on investor protection. The study was analyzed using a combination of panel Ordinary Least Square (OLS), multiple Ordinary Least Square (OLS), and Principal Component Analysis (PCA). The panel regression result indicated that country-level governance indeed has a significant impact on the strength of investor protection. The study concluded that both investment and political environment stakeholders must collaborate strongly to identify adequate governance mechanisms that could contribute to the enhancement of investors' protection strength. Allard and Martinez (2008) examined the association between a country's social policies and its ability to attract foreign direct investment as well as the role of non-governmental organizations (NGOs) in shaping the institutional environment and influencing foreign investment into host countries. The study found a significant relationship between a country's social policies and its attractiveness to private investment funds. The study was analyzed using Ordinary Least Square (OLS) regression.

Other research studies that were based on descriptive analysis but established the impact of aspects of governance institutions on the investment climate include Raval (2015), who examined the effects of the political environment on the ease of doing business in India and reported that the political environment affects the ease of doing business through its impact on the economy, changes in regulation, political stability, and mitigation of risks. Similarly, using explorative research methods and secondary data obtained from various sources, Clue and Fulton (2013) revealed that the country's governance institutions impose a significant impact on the business environment. According to the authors, an economy with a high concern for law compliance, a relatively adequate bureaucratic level, and an efficient corruption control mechanism would provide the necessary framework for ensuring economic performance for the business environment. A recent study by Gaur and Padiya (2017) examined the Indian business environment and the factors that militate against its improvement. The study finds that the business environment is better when there is better regulatory quality and rapid implementation of such regulatory policies.

Handoyo (2017) used data collected from 188 countries around the world to explore the association between the practice of good public governance in governmental institutions and the performance of government in terms of ease of doing business score. The public governance which served as the dependent variable of the study was measured using the six indicators namely effectiveness government, control of corruption, public accountability, political stability, rule of law and regulatory quality. The study measured ease of doing business using distance to frontier (Dtf). Bivariate correlation was used to analyze the data and the results revealed that all the six indicators of public governance recorded positive and significant relationships with ease of doing business score with political stability having the least impact. Nageri and Gunu (2020) conducted a study on ECOWAS countries to examine how ease of doing business is influenced by corruption. The data used in the study were unbalanced panel data of selected ECOWAS countries which were analyzed using the fixed effect panel regression technique based on the outcome of specification tests. Corruption was measured using corruption rank, corruption score, and control of corruption. Results of their study indicate that corruption rank has a negative and significant influence on ease of doing business while corruption score and control of corruption recorded a significant positive impact on the ease of doing business.

Other studies examined the determinants of the investment climate without referring to governance institutions. We hope these findings will help us to draw up control variables for this study. Examples include Khader, Rajan, and Sen (2014), which covers a cross-section of 109 countries around the world to examine varying factors that could affect how easy it is to conduct a business. The study found that per capita GDP has a negative and statistically significant impact on the ease of doing business, while interest rates have a positive and statistically significant impact on the ease of doing business.

Data and Methodology

Empirical model specification

The model specification of this study is based on the reviewed research works as well as the authors' intuition. Based on the reviewed research work, there is every reason to believe that the investment climate is affected by political, economic, social, and institutional factors. Accordingly, the model of this study relates investment climate with the macroeconomic factors that include: GDP per capita, inflation, and broad money supply; social factors such as urbanization and institutional factors, which are proxied here with governance. The model is presented as:

$$IVC_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi GOV_{it} + \mu_{it} \quad (1)$$

Where IVC_{it} is the investment climate, PCI_{it} is per capita income, BMS_{it} is the broad money supply,URB_{it} is the urbanization, GOV_{it} is governance, INF is inflation, TOP is trade openness and μ_{it} is the error time all for country i at time t.

A major problem associated with the panel data model in (1) is the nature of the error terms. If the error term in (1) is not white noise due to the presence of unobserved country-specific effects, which often characterize panel data models, the error term could then be expressed as:

$$\mu_{it} = \rho_i + \varepsilon_{it} \quad (2)$$

If equation (2) is true, then equation (1) could not be estimated using OLS since it will lead to bias and inconsistent estimates; otherwise, OLS will be an appropriate estimation technique. In the presence of an unobserved country-specific effect, the model in (1) becomes

$$IVC_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi GOV_{it} + \rho_i + \varepsilon_{it} \quad (3)$$

Where ε_{it} is the error term which is white noise, τ is the intercept term that captures changes common to all countries and ρ_i is the unobserved country-specific effects that could be either fixed or random. If the ρ_i is fixed, the appropriate estimation technique is the fixed effect model, while the random effect model is the appropriate technique if the effect is random.

Since governance is represented by six different indicators which are likely to be collinear and investment climate represented by the ease of doing business score using distance to frontier methodology, the baseline model of the study in equation (3) is presented as below to capture each of the six clusters:

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi CCR_{it} + \rho_i + \varepsilon_{it} \quad (4)$$

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi ROL_{it} + \rho_i + \varepsilon_{it} \quad (5)$$

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi GE_{it} + \rho_i + \varepsilon_{it} \quad (6)$$

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi RGQ_{it} + \rho_i + \varepsilon_{it} \quad (7)$$

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi PSAV_{it} + \rho_i + \varepsilon_{it} \quad (8)$$

$$EODB_{it} = \tau + \sigma PCI_{it} + \vartheta OPN_{it} + \varphi INF_{it} + \gamma BMS_{it} + \pi URB_{it} + \omega TOP_{it} + \Psi VAA_{it} + \rho_i + \varepsilon_{it} \quad (9)$$

Where; $EODB$ = Ease of Doing Business score based on DTF, CCR = Control of corruption, ROL= Rule of law, GE= Government effectiveness, RGQ= Regulatory quality, $PSAV$= political stability and absence of violence and VAA= Voice and accountability

Estimation technique

The data collected for the study were analyzed using panel feasible generalized least square regression. This method was chosen based on the outcome of the various diagnostic tests presented in Section 4 of the study. The various diagnostic tests conducted in the study include the serial correlation test using the Wooldridge test for serial correlation in panel data, the test for cross-sectional independence using the Pesaran test, the heteroscedasticity test using the modified Wald Groupwise heteroscedasticity test, and the normal distribution test using the Shapiro-Wilk test. The results of the diagnostic tests presented in the next section reveal that the data used in this study could not pass any of the stated diagnostic tests. Hence, the study adopts the panel feasible generalized least square, which allows for the estimation of a panel regression in the presence of first-order serial correlation within panels, heteroscedasticity, and cross-sectional correlation across panels. (Baltagi, 2005; Cameron & Trivedi, 2009).

Variable description and data source

The description of the variables used in the study and the corresponding data source is presented below:

Dependent variable

In this study, the investment climate is defined as the sum of all external forces influencing business organization and operation. Such external factors are beyond the control of the individual business unit, even though it operates within it. The most widely recognized indicator of the investment climate is the Ease of Doing Business Index (EDBI). However, due to methodological limitations arising from the use of different methods for obtaining the EDBI in various years, the Distant to Frontier (DTF) is now being estimated, and it is useful for the time series analysis of the investment climate. The DTF is obtained from the ease of doing business rank of countries for various years (usually five years) in line with the Doing Business methodology of the World Bank. The DTF provides an annual measure of the distance of an economy from the frontier of the ease of doing business rank, which is the best performance in ease of doing business across countries in a particular year. It is indicated on a scale of 0 to 100, where a score of 0 signals the lowest performance, and a score of 100 is the frontier. The ease of doing business score obtained from the DTF is therefore used in this study to proxy the investment climate. The scores are obtained from the World Bank's World Development Indicators database, and the data with the latest methodology is available from 2015 to 2019.

Independent variables

Per capita income (PCI) is one of the economic factors, and it is a proxy for the development of a country. The PCI is the income per head, and it is expected to be positively related to the investment climate since the investment climate becomes more favourable with a higher level of development. There may, however, be exceptions where PCI may negatively affect the investment climate. This can occur if high per capita income reduces labour supply, as supported by economic theory (see Moorthy & Jason 2016). As a result, investors face a high cost of doing business, and PCI hurts the investment climate. The PCI is measured as the Gross Domestic Product (GDP) divided by the population. PCI data are also sourced from the World Bank's World Development Indicators (WDI) database.

Inflation (INF) is another economic factor that can affect the investment climate. It is a good measure of macroeconomic uncertainties. Thus, it is expected that inflation may normally be negatively related to the investment climate. The variable (INF) is measured by the consumer price index and the data is sourced from the World Bank's World Development Indicators (WDI) database.

The broad money supply is used to measure the extent of financial development in each of the sampled countries. The indicator has been recognized as a good measure of financial development. The size and depth of the financial system reflect the size of savings and investment, and by implication, large and developed financial systems have the capability of reducing financial constraints for credit. Hence, financial development can reduce bottlenecks to a favourable investment climate. With that, this study

expects a positive relationship between the measure of financial development and the investment climate. The broad money supply is calculated by multiplying the broad money supply ratio by 100. Data on broad money supply is extracted from the WDI database.

Openness is a globalization indicator and captures the extent to which an economy is open to the rest of the world. A considerable level of openness signals fewer trade barriers, which may positively affect the investment climate. Earlier studies show that openness affects the investment climate through various channels, such as increased commercial and financial integration, technology transfer, and the diffusion of knowledge from industrialized countries to developing ones (Pollard, Piffaut, and Shackman 2013). Therefore, a positive relationship is expected between the investment climate and trade openness. The variable is measured as the ratio of the trade balance to GDP multiplied by 100, and the data is obtained from the WDI database.

Urbanization is a socio-demographic factor that affects the investment climate. Higher levels of urbanization are synonymous with high population density, which has the potential to enhance business activities through increased specialization, knowledge diffusion, and spillover effects (Pollard, Piffaut, and Shackman 2013). The extent of urbanization is equally a good signal for infrastructure development in a country, as urban concentrations are characterized by a relatively higher level of infrastructure compared to rural areas. With the externalities associated with urbanization, such as higher crime rates, drug abuse, alcohol consumption, and violence, which may serve as disincentives for investors and entrepreneurs, it may negatively impact the investment climate. The variable is measured as the ratio of urban to the total population and is sourced from the WDI database.

Governance institutions are conceptualized here in line with the World Bank definition (see Kaufmann et al., 2006) as the totality of traditions and institutions by which authority in a country is exercised. They include: (i) the process by which governments are selected, monitored, and replaced; (ii) the government's capacity to effectively formulate and implement sound policies; and (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them. The indicators for the three dimensions of good governance are developed in index form by Kaufman, Kraay, and Zoido-Lobotan (KKZ), which is recognized as the most complete measure of governance institutions and covers over 200 countries using various indices compiled by over 31 institutions (Ngobo and Fouda 2012). The indicators, which are based on unobserved components methodology, scored each country within the range of -2.5 (for the worst governance outcome) to +2.5 (for the best governance outcome). The data on the clusters of governance institutions is taken from the World Bank's World Governance Indicators database.

The process by which governments are selected, monitored, and replaced is represented by two indicators, namely, voice and accountability, which reflect the extent to which a country's citizens can participate without hindrance in the selection of those who govern them, as well as freedom of expression and association. Political stability measures the perception of the likelihood of a government being overthrown and destabilized by unconstitutional or violent means. Better performance on these two indicators will signal the country's stability, lower business risk, and consistent government policy, all of which are vital for a better investment climate. These two indicators are expected to be positively related to the investment climate.

Government capacity comprises two aspects, namely: government effectiveness and regulatory quality. Government effectiveness is a measure of the quality of public service and civil service and the extent to which they are free of political pressures; the quality of policy formulation and implementation; and the credibility of government commitment to such policies. Regulatory quality refers to the government's ability to formulate and implement sound policies and regulations that facilitate the development of the private sector. Better performance of the two indicators is expected to have a positive impact on the investment climate.

Respect for the institutions governing interactions is further broken into two aspects, which are the control of corruption and the rule of law. The control of corruption reflects the measure of the extent to which public power is exercised for private gains, while the rule of law is a measure of the extent to

which agents have confidence in and abide by the rules governing society. Better outcomes from these two measures are expected to bring about a favourable investment climate.

In terms of scope, this study covers thirty-nine (39) Sub-Sahara African countries between 2015 and 2019. The period was selected because the ease of business is conducted using a revised methodology, of which the latest was that of 2015.

Results

Descriptive analysis

The summary statistics of the variables are presented in Table 1. The average ease of doing business (EODB) for Sub-Sahara Africa during the sampled period is 50.85, with a minimum of 31.955 and a maximum of 81.468, implying that the investment climate in the region is a little above average. The extent of urbanization in the continent is low, with a mean of 43.289 and a minimum and maximum of 12.078 and 90.092, respectively. The trade openness shows a relatively moderate level of globalization in the region, with a mean, minimum value, and maximum value of 63.692, 0.785, and 152.515, respectively. The average inflation rate within the sampled period for the sampled countries was 10.199, with a corresponding standard deviation of 45.34, which is above half of the mean value. This shows a considerable high variation in inflation rates across the region. The mean log of annual income per capita is 7.161, with a minimum of 5.6009 and a maximum of 9.3311. All the six clusters of governance institutions have a negative mean value. Since the indicators range between -2.5 and 2.5, it implies that the countries in the region jointly perform below average in governance institutions.

Table 1: Summary Statistics of variables

Variable	Obs	Mean	Std.Dev.	Min	Max
EODB	195	50.985	9.958	31.955	81.468
CCR	195	-.659	.623	-1.925	.951
GEF	195	-.777	.606	-1.878	1.057
PSAV	195	-.56	.792	-2.337	1.111
RGQ	195	-.673	.551	-2.102	1.126
ROL	195	-.665	.588	-1.92	.923
VAA	195	-.468	.716	-2	.979
PCI	195	-.129	4.345	-22.312	7.929
Infd	195	10.199	45.34	-20.193	558.56
TOP	195	63.692	28.188	.785	152.515
Urb	195	43.289	17.866	12.078	90.092
BMS	195	35.418	22.276	12.29	163.744

Source: Authors' Computation, 2021

Correlation analysis

The estimated correlation coefficients among the variables are presented in the correlation matrix of Table 2. The correlation coefficients between ease of doing business and each of the explanatory variables are positive, except for inflation, which exhibits an inverse relationship with ease of doing business. The results imply that an increase in each of the variables except inflation is associated with improved ease of doing business and investment climate by extension, while higher inflation is associated with lower ease of doing the business score, which would result in an unfavourable investment climate. In addition, the estimated correlation coefficient among the explanatory variables is considerably low except among the six clusters of governance, which mostly display a considerably high level of correlation. Most of the coefficients among the six clusters are above the threshold of 0.7 for multicollinearity (Kennedy, 2008). The correlation results imply that incorporating all the six clusters of governance into a single regression may result in multicollinearity. To avoid the potential problem of multicollinearity, the study estimated each of the indicators of governance institutions under a separate model.

Table 2: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) EODB	1.000											
(2) CCR	0.708	1.000										
(3) GEF	0.833	0.855	1.000									
(4) PSAV	0.518	0.690	0.679	1.000								
(5) RGQ	0.840	0.835	0.928	0.615	1.000							
(6) ROL	0.821	0.914	0.936	0.738	0.915	1.000						
(7) VAA	0.714	0.904	0.825	0.671	0.838	0.874	1.000					
(8) PCI	0.311	0.347	0.281	0.022	0.340	0.291	0.391	1.000				
(9) INF	-0.010	-0.118	-0.106	-0.093	-0.171	-0.116	-0.127	-0.154	1.000			
(10) TOP	0.082	0.324	0.245	0.477	0.198	0.252	0.280	-0.174	-0.071	1.000		
(11) URB	0.007	-0.162	-0.076	-0.263	-0.127	-0.162	-0.132	-0.040	0.036	-0.340	1.000	
(12) BMS	0.508	0.603	0.640	0.520	0.584	0.614	0.614	0.175	-0.085	0.354	-0.117	1.000

Source: Authors' Computation, 2021

Diagnostic tests

The study conducted various diagnostic tests to ensure that the classical linear regression assumptions were not violated. The tests conducted include the Shapiro-Wilk test for normal distribution, the Wooldridge test for serial correlation in panel data, the Pesaran test for cross-sectional independence, the Modified Wald test for GroupWise heteroscedasticity, and the Variance Inflation Factor test for multicollinearity. The results of the Shapiro-Wilk test are presented in Table A (*see appendix*). The results revealed that the null hypothesis of normal distribution was rejected for each of the 12 variables used in the study.

Hence, the test suggests that the data used in the study is not normally distributed. For the results of the Wooldridge test, each of the six models (for the six governance clusters) was tested to check for the violation of the no serial correlation assumption. The results of the Wooldridge test for serial correlation in panel data are contained in Table B (*see appendix).* The results revealed that in each of the six models, the corresponding p value of the Wooldridge test is less than 0.01, implying that the null hypothesis of serial correlation is rejected in all cases. Thus, the six models are characterized by a serial correlation problem. Similarly, the study checked for cross-sectional independence using the Pesaran test and the results are contained in Table B. The p value of the Pesaran test in each of the six models suggests that the null hypothesis of cross independence is rejected. Hence, the models are characterized by the problem of cross-sectional dependence, which would manifest in indigeneity issues. In addition, the results of the modified Wald Groupwise heteroscedasticity are contained in Table B. The respective p value of each of the models is less than 0.01, implying that the null hypothesis of homoscedasticity is rejected in each of the models. Hence, the data used in the study fails to pass any of the classical linear regression assumptions.

Panel feasible generalized least square regression analysis

The study established in the previous subsection that the data used in the study violated the classical linear regression assumptions of homoscedasticity, no serial correlation, exogeneity, and normal distribution. Hence, a panel method that corrects the problems must be used to arrive at consistent results and generalizations. Panel Feasible Generalized Least Squares (FGLS) regression is one such method, according to prominent econometric literature (Baltagi, 2005; Cameron & Trivedi, 2009). The feasibility generalized least square allows for the estimation of a panel regression in the presence of first-order serial correlation within panels, heteroscedasticity, and cross-sectional correlation across panels.

The results obtained using panel FGLS techniques are presented in Table 3. Due to the high correlation coefficient that exists among the components of governance, all the components could not be

incorporated into a single regression because of the multicollinearity problem. As a result, columns 1 to 6 represent results obtained from various specifications using different components of governance institutions.

Table 3: Estimated Panel Feasible Generalized Least Square Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
LPCI	5.111***	2.826***	2.157***	3.661***	4.271***	5.952***
	(0.000)	(3.82e-06)	(0.000209)	(0.000)	(3.00e-07)	(0.000)
INF	0.00965	0.0161	0.0147	0.0301***	0.00239	0.0114
	(0.453)	(0.146)	(0.155)	(0.00342)	(0.874)	(0.357)
TOP	-0.0324*	-0.0183	-0.00778	-0.00908	-0.0467**	-0.0229
	(0.0581)	(0.208)	(0.566)	(0.496)	(0.0257)	(0.161)
URB	-0.281***	-0.212***	-0.227***	-0.207***	-0.323***	-0.288***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BMS	0.0345	0.0136	-0.00960	0.00387	0.130***	0.00376
	(0.200)	(0.555)	(0.661)	(0.854)	(7.83e-06)	(0.889)
COC	9.828***					
	(0.000)					
ROL		12.58***				
		(0.000)				
GEF			13.44***			
			(0.000)			
RGQ				13.67***		
				(0.000)		
PSAV					5.809***	
					(0.000)	
VAA						9.016***
						(0.000)
Constant	34.17***	49.12***	56.71***	42.92***	36.37***	26.47***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	195	195	195	195	195	195
Number of Cid	39	39	39	39	39	39
chi-square	405.1***	618.3***	736.7***	767.3***	238.7***	449.3***

P value in parentheses, *** p<0.01, ** p<0.05, * p<0.1, Source: Authors' Computation, 2021

Models 1 and 2 present the estimated results when the impacts of control of corruption and the rule of law, which represent the respect of citizens and the state for the institutions that govern economic and social interactions among them, are estimated. In model 1, control of corruption is included as a proxy of governance. The results, which are presented in column 2, with a coefficient of 9.828, indicating that corruption control has a significant positive impact on the investment climate of 1% (0.0000.01). Similarly, among the control variables included, trade openness and urbanization have a significant negative impact on the investment climate, while the log of per capita income has a positive and statistically significant impact on the investment climate. The other control variables have no statistically significant influence on the investment climate. In column 3 of Table 3, the results from model 2, where the impact of the rule of law on the investment climate is estimated, are reported. Similar to model 1, we find that an increase in the index of the rule of law has a statistically significant and positive impact on the investment climate represented by the ease of doing business score. Consistent with our apriori expectation, the log of per capita income is correctly signed and has a statistically

significant impact on the investment climate. On the contrary, the rate of urbanization's impact on the investment climate is found to be negative and significant. The significant impact of other control variables could not be established under the model.

Reported in columns 3 and 4 of Table 3 are the results under which the impact of the government's capacity to effectively formulate and implement sound policies, which is made up of government effectiveness and regulatory quality, is estimated. From the results reported in column 4, we find that government effectiveness has a positive and significant impact on the investment climate, given the estimated coefficient and corresponding p-value of 13.44 and 0.000, respectively. Consistent with our apriori expectations, the broad money supply and the level of per capita income has a positive and statistically significant impact on the investment climate, while the negative and significant influence of trade openness and urbanization on the investment climate are contrary to our expectation. The result reported in column four is the estimated model under which the impact of regulatory quality is examined. We find a positive and statistically significant impact of regulatory quality on the investment climate. We also find the positive and significant impact of the log of per capita income on the investment climate in line with the study's apriori expectation. The impact of urbanization was negative and significant, while inflation has recorded a significant positive influence on the investment climate as measured with the ease of doing business score. However, neither the broad money supply nor trade openness had a significant impact on the investment climate.

Columns 5 and 6 present the results of the models wherein the impact of the perception of the process by which governments are selected, monitored, and replaced, which is indicated by the political stability and absence of violence (PSAV) and voice and accountability (VAA), is estimated. From the results of model 5, which estimates the impact of political stability and absence of violence on the investment climate, we find a positive and statistically significant impact of political stability and absence of violence on the investment climate, given their respective coefficients and p values of 5.809 and 0.000, respectively. The results further show that the log of capital income has a positive and statistically significant impact on the investment climate. Consistent with the findings in the other models, the rate of urbanization hurts the investment climate, while the impact of other control variables is not significant at all conventional levels of significance. The last column presents the result obtained from model 6, where the impact of voice and accountability is estimated. The estimated coefficient of 9.016 with a p-value of 0.0001 indicates that voice and accountability impact significantly and positively on the investment climate. Consistent with the theory and our apriori expectation, the log of per capita income has a positive and significant influence on the investment climate. On the contrary, and consistent with other model results, the rate of urbanization is found to be negative and significant. The other control variables have no significant influence on the investment climate.

Summarily, the results of the panel FGLS used in this study overwhelmingly support the positive impact of governance on the investment climate in Sub-Saharan African countries. Across the six models, we find that the three governance institution dimensions represented by the six clusters of governance institutions have a positive and statistically significant impact on the investment climate. Similarly, the log of per capita income, which is a variable of a country's development, was significant and positive in all the models, suggesting robust evidence of the significant influence of a country's economic performance on the investment climate. Financial development (measured by broad money supply) had no significant influence on the investment climate except in model 5. The results show that urbanization posted a statistically significant and negative impact on the investment climate across the six models, while inflation was statistically insignificant across the six models except in model 5. By implication, the positive impact of the log of per capita income and the negative impact of urbanization on the investment climate were consistent across the models.

From the presentations above, we find a positive and statistically significant impact of the country's development on the investment climate given the results reported for the log of per capita income. The positive impact of the log of per capita income recorded in some of the models also agrees with previous literature, including Pollard *et al.* (2013), who reported a positive and significant impact of per capita

income as an indicator of development on the investment climate and Grosanu *et al.* (2015), who reported a positive and statistically significant impact of country-level governance on the business environment. It contradicts (Karama, 2014; Khader, Rajan & Sen 2014), who reported a negative impact of per capita income on EDBI. This result may be linked to the fact that the higher (lower) level of per capita income implies a higher purchasing power, which means the availability of a market for the product of investors. This will encourage investors to invest in such an economy because the risk of losing money due to the unsold product will be significantly reduced.

The negative and significant impact of urbanization is inconsistent with the apriori expectation of this study, which is based on the assumption that urbanization has the potential to facilitate not only infrastructural development but also increased specialization and knowledge spillover, which are essential for favourable investment activities. However, the findings are consistent with the findings of Pollard et al. (2013), who discovered a positive (negative) and statistical impact of rural population share (urbanization) on the investment climate in a cross-country study of 180 countries. The results found for urbanization may be attributed to The negative influence of urbanization found in this study may be due to the low level of employment and crime rate associated with the migration of people from rural to urban areas. Hence, the prevalence level of unemployment, which translates to a higher crime rate in urban areas, makes the impact of urbanization on the investment climate turn negative in Sub-Saharan African countries.

The positive and significant impact of the government institution variables is consistent with some previous literature. The positive and statistically significant impact of the rule of law variable aligns with the work of Pollard *et al.* (2013) and Grosanu *et al.* (2015), who reported a positive and statistically significant impact of the rule of law on EDB rank. The finding of the positive and statistically significant impact of control of corruption contradicts Pollard *et al.*'s results of a positive but insignificant impact of control of corruption on the ease of doing business and is consistent with the findings of Karama (2014), who reported a negative impact of corruption, transparency, and accountability on EDBI. Our result for voice and accountability also contradicts the finding of Pollard, Piffault, and Shackman (2013), who reported a negative and statistically insignificant impact of voice and accountability on the ease of doing business in rank. The positive and statistically significant regulatory quality is consistent with our expectations as well as the findings of Grosanu et al. (2015). The positive and statistically significant impacts of government effectiveness and political stability and the absence of violence fail to agree with the negative and statistically significant impacts of government effectiveness and political stability and the absence of violence reported by Pollard, Piffault, and Shackman (2013).

The insignificant negative impact of trade openness contradicts the findings of Pollard *et al.* (2013), who reported a positive and significant impact of trade openness on the ease of doing business. The positive and insignificant impact of inflation on the investment climate was also reported by Pollard et al. (2013) in a cross-country study of 180 countries using Ordinal Logit (OLOGIT). The outcome may be because a significant impact of inflation may be seen in a country with a substantial level of economic and financial development as well as good governance institutions. Investors are more likely to see inflation and trade openness as second considerations once there are substantial levels of physical and financial development together with better governance institutions.

Concluding remark

The main objective of this study was to examine the impacts of governance on the investment climate in Sub-Sahara Africa (SSA). Our empirical analysis was based on the panel data for thirty-nine (39) SSA countries covering the period from 2015 to 2019. The data were analyzed using panel feasible generalized least square regression based on the outcome of various pre-estimation diagnostic tests, which suggest that the data violate the basic classical linear regression assumptions. We modelled the six clusters of governance institutions separately, given the high correlation that exists among them. Our panel FGLS result provides overwhelming support for the positive and statistically significant impact of governance on the investment climate, as we found a positive and statistically significant impact of each of the components of governance on the investment climate.

In line with the results, government effectiveness and regulatory quality recorded the highest impacts, with their respective coefficients of 13.67 and 13.44. This is followed closely by the rule of law with a coefficient of 12.58 and control of corruption with a coefficient of 9.828. The voice and accountability, with a coefficient of 9.016, and political stability and the absence of violence, with a coefficient of 5.809. Therefore, the study established consistent evidence of the positive impact of governance on the investment climate in SSA, with the government's capacity to effectively formulate and implement sound policies playing the dominant role, followed by the respect of citizens and the state for the institutions that govern economic and social interactions among them, and the perception of the process by which governments are selected, monitored and replaced in that order. Hence, significant efforts must be devoted to the promotion of governance in its various dimensions, especially government capacity, in Sub-Saharan African countries as part of strategies towards enhancing the investment climate in the region. In addition, a commitment must be made to increase the income per capita of the citizens, which would increase the effective demand needed for businesses to thrive.

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Appendix

Table A: Shapiro-Wilk W test for normal data

Variable	Obs	W	V	Z	Prob>z
EODB	215	0.968	5.017	3.724	0.000
COC	258	0.972	5.311	3.891	0.000
GEF	258	0.956	8.194	4.901	0.000
PSAV	258	0.979	4.000	3.230	0.001
RGQ	258	0.968	5.942	4.152	0.000
ROL	258	0.980	3.780	3.098	0.001
VAA	258	0.984	3.054	2.601	0.005
PCIGRW	258	0.893	19.993	6.980	0.000
Infd	258	0.194	150.340	11.681	0.000
TOP	238	0.965	6.016	4.165	0.000
Urb	258	0.541	85.662	10.370	0.000
BMS	235	0.726	47.000	8.930	0.000

Source: Authors' Computation, 2021

Table B: Diagnostic Test Results

Models	F Value	P-value	Remarks
Pesaran Cross-Sectional Independence Test			
1	14.353	0.000	Cross-Sectional Dependence
2	16.615	0.000	Cross-Sectional Dependence
3	8.986	0.000	Cross-Sectional Dependence
4	16.120	0.000	Cross-Sectional Dependence
5	13.986	0.000	Cross-Sectional Dependence
6	11.227	0.000	Cross-Sectional Dependence
Wooldridge test for autocorrelation in panel data			
1	64.649	0.000	Presence of Serial Correlation
2	57.376	0.000	Presence of Serial Correlation
3	66.885	0.000	Presence of Serial Correlation
4	62.363	0.000	Presence of Serial Correlation
5	64.339	0.000	Presence of Serial Correlation
6	67.417	0.000	Presence of Serial Correlation
Modified Wald test for GroupWise heteroskedasticity			
	Chi-Square	P-value	
1	9e+05	0.000	Presence of Heteroscedasticity
2	64687.33	0.000	Presence of Heteroscedasticity
3	35307.49	0.000	Presence of Heteroscedasticity
4	83460.01	0.000	Presence of Heteroscedasticity
5	5.1e+05	0.000	Presence of Heteroscedasticity
6	1.3e+05	0.000	Presence of Heteroscedasticity

Source: Authors' Computation, 2021