



Research article

Effect of governance on investment: Evidence from Sub-Sahara Africa

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Abstract: In this study, we investigated the impact of institutional quality on private and public investments in sub-Saharan Africa (SSA) using a sample of forty-one (41) countries between 2002–2021 using a system GMM. Using seven proxies of institutional variables, the results showed that all the institutional proxies had a positive and significant effect on private investment and a negative effect on public investment. We argued that higher institutional quality reduced the costs of doing business, increased investor confidence in the economy, and that property rights enforcement and the legal system increased the attractiveness of private investment in the region. Conversely, for public investment, we argued that better institutional quality exposed the inefficiency of the sector as they were mostly used for rent-seeking and perpetrate corruption, and as such reduced public investment. The results were also robust to different measures of institutions and governance indicators. We recommended that SSA governments improve project oversight and accountability, reduce corruption, promote transparency and citizen participation, strengthen anti-corruption measures, and invest in infrastructure through public-private partnerships in order to improve efficiency in the public sector. Also, governments must ensure lower lending rates, improve the efficiency of credit markets, and ensure better institutional indicators in order to increase private investment.

Keywords: Investment; governance; institutions; property rights; sub-Sahara Africa; GMM

JEL Codes: C23, E02, E22, H54, P48

1. Introduction

A country's investment climate is significantly influenced by the quality of its institutions. This is mainly because investment is an adventure into the future, and most entrepreneurs seek environments that are safe and stable before making investments (Asongu & Odhiambo, 2020). We test this argument by examining the effects of institutional variables on investment in sub-Saharan Africa. Investment is seen as a strategy for advancing technology, creating jobs, and reducing poverty in many economies. Investing in new equipment that combines technological advancements and boosts labor productivity can increase production capacity. Along with raising employment and salaries, it can also boost productivity by raising aggregate demand (Ouedraogo & Kouaman, 2014). For instance, investments in buildings and machines support the existing demand for capital goods, which raises domestic spending in addition to creating jobs. Aggregate supply rises in response to increased investment, which lessens the likelihood of stagflation (Iheonu, 2019). For nations where achieving steady progress towards economic growth and development is the main goal, investment is crucial.

In the short run, investments from the public and private sectors can increase employment and output by improving aggregate demand. Private investment increases the economy's potential production and creates jobs over time by directly increasing its productive capacity. New industrial methods and procedures can also increase productivity, especially when foreign direct investment (FDI) is involved (Barhoumi et al., 2018). Supply-side impacts are also brought about by public investment through various mechanisms. It is a stimulus for productivity growth and the development of the private sector because of its highly complementary character. Infrastructures for communications, electricity, and transportation must all function reliably in order to attract private sector investment. Building human capital and boosting productivity and competitiveness also depend on having effective health and education systems (Barhoumi et al., 2018).

Given its ability to improve socioeconomic conditions and general well-being, investment in the subregion is crucial and should not be undervalued. However, governance issues have a big impact on how well investments work in Sub-Saharan Africa. Morrissey and Udomkerdmongkol (2012) argue that higher investment is correlated with good governance. Investment decisions are directly impacted by the quality of governance standards, which include political stability, respect for the law, transparency, and the lack of corruption (Morrissey & Udomkerdmongkol, 2012).

Investors are more likely to allocate their capital to economies with good governance practices since these attributes reduce risks and provide a favorable atmosphere for conducting business Khan (2007). Research has shown governance to be a key element in understanding the variations in economic performance among developing nations Khan (2007). Akanbi (2016) noted that the unsteady political environment in most African economies has stayed a significant impediment to the increase in domestic investment over the years. Furthermore, a growing body of research on African development contends that institutional quality is crucial for stimulating private investment, growth, inclusive development, and the fight against policy set of symptoms like terrorism and capital flight (Bakari & Benzid, 2021; Mohammadi et al., 2017; Asongu & Nwachukwu, 2017). Prudent economic governance is also necessary to initiate, advance, and sustain an economic revolution that positions the public and private sectors at the vanguard of investment, innovation, and wealth creation (Pritchett & Werker, 2012).

The promotion of high-quality capital spending has long been a major policy concern in sub-Saharan African nations. Over the past 20 years, a number of studies have emphasized that the major obstacles to growth and job creation are the inadequate amount of private (domestic and foreign) investment and the

dearth of state investment (see, for example, IMF, 2014, 2015; Barhoumi et al., 2018; Bayraktar, 2019; Cook & Jones, 2021). The quality of investments has also received a lot of attention. In terms of public investment, the emphasis has been on organizations and procedures meant to encourage capital expenditures by the government that have a significant influence on employment and growth (IMF, 2014). Studies on private investment have shown how important it is to encourage efficient capital allocation away from energy-intensive and hydrocarbon-based businesses (especially for oil exporters) and towards industries that support job creation and sustainable growth. Infrastructure funding from the private sector has increased in sub-Saharan Africa throughout the last 15 years. Bank lending has been the main source of private funding for infrastructure projects in sub-Saharan Africa. It comes in several forms, including investment in equity, syndicated loans, concessions, and infrastructure bonds (Barhoumi et al., 2018). Notably, infrastructural investment in sub-Saharan Africa has been mainly spearheaded by China. In 2017, they accounted for about 40 percent (about \$8.8 billion) of the region's infrastructure finance. In the last four years, Chinese banks have actively lent money to infrastructure projects in 19 different African countries (Baker & McKenzie, 2019; Ehizuelen, 2021).

Investment in SSA has been significantly impacted by the region's numerous governance issues. These obstacles, which include corruption, a weak legal system, and unstable politics, have made it more difficult for investment opportunities to expand (Newiak, 2022). Because of the uncertainty it brings, a lack of political stability deters investors from allocating capital to the area (Gyimah-Brempong & Traynor, 1999). Furthermore, because it creates an air of unpredictability in economic dealings, a weak rule of law damages investor trust (Byamugisha & Dubosse, 2023). Since transparency enables investors to make educated judgements, it is also essential for drawing in investment (Newiak, 2022). Sub-Saharan Africa has a high rate of corruption, which discourages investment by raising the risk and uncertainty of doing business (Hanson, 2009). Therefore, resolving these governance concerns is essential to luring investment and propelling the region's economic growth.

We argue, along with the findings of Grigoli and Mills (2014), that public investments are used by public officials for rent-seeking and as such, improving the quality of institutions only exposes the inefficiencies of the public sector, and thus reducing public investment. While private investment uses quality institutions as a stimulus to growth. The literature on institutions and investment has mainly focused on the aggregate impact of institutional indicators on investment (Moskalenko et al., 2022; Mohammadi et al., 2017; Aysan et al., 2006; Le & Rishi, 2010). Some have also focused mainly on the effect of institutions on private investment (Asongu et al., 2021; Iheonu, 2019; Bakari & Benzid, 2021). Our study contributes to the literature in two key areas. First, we expand the existing understanding of the relationship between investment and institutions in Sub-Saharan Africa through the use of all six indicators of institutional quality by the World Bank in our estimation models. The rationale behind the use of several institutional quality indicators is in line with the notion of the significance of disentangling governance assessments to prevent conceptual misunderstandings and improve policy relevance in Africa (Asongu & Odhiambo, 2020). Second, by comparing the ways in which public and private investment in SSA are differently influenced by institutions, our study contributes to the advancement of scholarly discourse. Through our analysis of the distinct effects on these two types of investments, we provide practitioners and policymakers with important information. This comparative lens acknowledges the differences between public and private investment decisions and the ways in which governance may affect them. This dynamic has been missing in the literature on investment and institutions in sub-Saharan Africa. We further test the robustness of our result using

a different measure of institutions, which measures the effectiveness of the legal system and the enforcement of property rights.

The rest of the paper is structured as follows: Section 2 details the review of both theoretical and empirical literature, while Section 3 discusses the data and sources and the estimation strategies employed. The empirical results and discussion are presented in Section 4, and Section 5 contains the conclusions and recommendations emanating from the research.

2. Literature review

According to North (1990), institutions are man-made limitations made up of social, political, economic, and structural problems. Institutions do, in fact, stand in for the official and unofficial rules of the game in which various economic actors and players engage in order to maximize their gains and returns. Effective institutions have an impact on economic activity through a variety of avenues, including lower transaction, manufacturing, and production costs (North, 1990; Betz & Betz, 2022; Yıldırım & Gökalp, 2016). Furthermore, high-quality institutions contribute to lower operating costs, which raises profitability. However, it takes more time and money to monitor markets with weak institutions. There is a significant risk premium and slower economic growth when property rights are not adequately safeguarded, and contract enforcement is challenging (North, 1990; Constantine, 2017). In such a hazardous and unfavorable climate, foreign investors are reluctant to make investments. On the other hand, a nation would do well to be located in a low-risk environment, and strong institutions encourage greater investment.

According to Lucas (1993), institutional factors—rather than just economic factors—are more significant in drawing in foreign investment to emerging nations. Profitability is influenced by a nation's institutional strength, and nations with strong institutions can draw in investors by providing high rates of return. In addition to economic considerations, Dunning (1998) broadens the definition of locational advantage by including institutional elements. He contends that regions with the best institutional and economic amenities are preferred by investors. Therefore, the rate of return based on reliable institutions and other macroeconomic data influences the decisions made by investors. The foregoing discussions indicate that investment thrives in environments where institutional quality does not hamper their operations.

According to the theoretical literature, investment activities are affected by institutional quality variables. Previous empirical studies have outlined this relationship using various measures and methods. Feng (2001) finds that while political instability and unclear policies have a detrimental effect on private investment, political freedom increases human capital and has a beneficial effect on private investment. According to Stasavage (2002), while checks and balances certainly encourage private investment, they are not a necessary prerequisite for increasing private investment levels. In a similar vein, Emery (2003) contends that while private investment plays a major role in promoting economic growth, reducing poverty, and enhancing welfare, it is also directly impacted by the quality of institutions. He makes the point that the removal of administrative restrictions that support corruption is the mechanism via which the quality of institutions influences private investment.

Aysan et al. (2007a) measure the perceived quality of governance on private investment in MENA nations using three separate indicators: “Quality of Administration”, “Political Accountability”, and “Political Stability”. Their findings highlight the variety of potential governance metrics available and demonstrate that the perceived quality of governance is a key factor in determining private investment

decisions in developing nations. Aysan et al. (2007b) discover that governance is a significant factor of private investment. The ratio of private investment to GDP is improved in particular by political stability, law and order, and corruption control.

Aysan et al. (2006) contend that factors such as law and order, stability in the political environment, administrations that are receptive to investments, bureaucratic quality, and corruption control are important in explaining private investment decisions in the Middle East and North Africa (MENA) area. Ngov (2008) showed that the total investment ratio—which combines FDI and domestic investment—is positively impacted by good governance. Le and Rishi (2010) show that private investment is positively correlated with an efficient government, which includes a credible set of governmental policies and a capable and autonomous civil service. More private investment is also made possible by equitable and predictable game rules that establish the level of property rights protection.

Morrissey and Udomkerdmongkol (2012) indicate that there is evidence of crowding out (FDI displaces local private investment), overall investment (FDI and private) is higher in nations with sound governance, and the degree of crowding out is correlated with governance. The governance metrics that seem to have the biggest effects on investment are political unrest and corruption. When it comes to the relationship between foreign direct investment (FDI) and domestic private investment, political stability is determined to be the most significant component of governance. In politically stable regimes, a rise in FDI has the largest impact on decreasing private investment (while increasing total investment). Grigoli and Mills (2014) find that institutional quality has an inverse relationship with public investment and argue that public investments are used for rent-seeking. Ouedrago and Kouaman (2014) showed that while a business-friendly climate encourages investment in sub-Saharan Africa, stringent restrictions hinder private investment in the region. In MENA nations, Mohammadi et al. (2017) investigated the effects of governance on employment, investment, and per capita income. Their findings suggest that investment, employment, and per capita income are positively impacted by governance characteristics. Agyei (2017) finds that public investment is affected by institutional variables using data from sub-Saharan Africa.

According to Aswata et al. (2018), institutional quality influences investment. When corruption control gets better, there is a change in the impact of public debt on either foreign direct investment or private domestic investment. Zakharov (2019) addresses the endogeneity problem by including new instrumental factors for corruption, such as the existence of the free press and violations of journalists' rights to freedom. The main conclusion is that overall fixed capital investment is severely and negatively impacted by corruption. He discovered that corruption lowers private investment but not state-owned enterprise investment when breaking down investment by ownership. Businesses that have made foreign investments are more influential. Additionally, there is a clear negative correlation between corruption and capital goods imports into the region.

In a study, Bakari and Benzid (2021) demonstrated that while corruption has a detrimental effect on domestic investment, democracy and investment freedom have a favorable effect. According to Iheonu (2019), domestic investment in Africa is positively and significantly impacted by all governance variables, with the exception of government effectiveness. Furthermore, Voice/Accountability and the control of corruption have a stronger effect on domestic investment, as indicated by their respective coefficient values.

Almustafa (2022) examines how the correlation between stock returns and the COVID-19 crisis is influenced by the quality of a nation's governance framework. They contend that the correlation between COVID-19 and stock performance across markets may be moderated by the quality of

national governance. Asongu et al. (2021) investigate the relationships between African institutions, finance, and private investment. They evaluate the connections between many facets of institutions protecting property rights and private capital, particularly those pertaining to institutional, political, and economic governance. The results lend credence to the idea that institutional quality is a stronger positive indicator of private investment than the growth of financial intermediaries. The lack of a strong relationship between finance and governance and the opportunity for private investment may be attributed to the well-documented surplus liquidity difficulties in African financial institutions.

Moskalenko et al. (2022) demonstrate that a country's appeal to investors within the EU is positively and statistically significantly impacted by the quality of its institutions. However, a nation's appeal to investors is positively impacted by political stability, freedom, and good governance. There is no statistically significant relationship between a nation's investment attractiveness and its rule of law. Poland's investment appeal is enhanced by the rule of law, as shown by Nay et al. (2022). Academics highlight the importance of the legislative foundation in enhancing the appeal of investments in environmentally friendly projects aimed at mitigating climate emergencies. The GMM model is used by Othman (2022) to validate the impact of economic freedom on a nation's appeal to investors. Moreover, he argues that financial and economic independence positively and significantly affects the Arab countries' appeal as investment destinations.

The review of literature indicates that literature has been focused on institutions and private investment with little attention on public institutions. Also, most studies that use all indicators of governance do not consider the high correlation between institutional quality variables and include them all in a single model (Ullah & Khan 2017). The following hypothesis emanates from the theories.

H1: Institutional quality variables have positive effects on private investment.

H2: Institutional quality variables have negative effects on public investment.

3. Materials and methods

This section outlines the description of the data and variables used in the study. It also presents the theoretical and empirical model specifications of the relationship between institutional variables and investment in sub-Saharan Africa.

3.1. Theoretical framework

Due to the long-term nature of investments, private investors require reassurance that the government in charge will uphold the rule of law and defend their right to own property. They also want disagreements to be settled quickly, equitably, and pleasantly. Inadequate conflict resolution raises the expense of litigation, which has a detrimental effect on the firm's transaction costs. Later, these expenses are passed on to customers in the form of higher pricing. Exorbitant prices can result in lower sales, which can force businesses to close and discourage new investment in an economy (Kalabamu, 2021; Shivute, 2008).

In this study, we use the "neoclassical flexible accelerator model" as the framework for the study. According to the approach, businesses invest now in order to increase their profitability later on (Jorgenson, 1967). Therefore, the problem of maximizing a firm's profit is the flexible accelerator. It makes the assumption that net investment is the gradual adjustment of the real capital stock to the target level. The initial capital stock, the user cost of capital, the wage rate, and the predicted aggregate

demand, often known as the accelerator, all influence investment in this model. Thus, the goal of this work is to create a standard accelerator investment function. Other variables that capture institutional quality factors are then included.

According to the accelerator theory, output growth determines investment. Consequently, there is a variation in capital stock between the two time periods. The appropriate capital stock as a function of output and thus proportional to output as

$$K_t = \gamma Y_t \quad (1)$$

In this equation, K_t is the desired capital, Y_t is the output and γ is the coefficient of adjustment. Therefore, taking the differential of equation 1 results in

$$\Delta K_t = \gamma \Delta Y_t \quad (2)$$

A capital accumulation identity function is defined as follows in order to determine the link between capital stock and investment levels:

$$K_t = (1 - \delta)K_{t-1} + I_t \quad (3)$$

where δ is the coefficient of depreciation, I_t is the gross investment and K_{t-1} is the capital stock at time t-1. Deducting K_{t-1} from equation 3 yields

$$K_t - K_{t-1} = -\delta K_t + I_t \quad (4)$$

When $\delta=0$, rearranging equation 4 yields an identify given as

$$I_t = \Delta K_t \quad (5)$$

Such that when we substitute equation 5 into 2, we drive the investment function.

$$I_t = \gamma \Delta Y_t \quad (6)$$

Consequently, investment is reliant on output growth. Thus, the ultimate gross investment model becomes into

$$I_t = \alpha + \gamma \Delta Y_t + X_t + \varepsilon_t \quad (7)$$

where X_t captures other variables including the institutional quality indicators and other macroeconomic variables.

3.2. Model specification

To determine the impact of institutional quality indicators on investments, we estimate a dynamic system using the General Methods of Moments, which were first proposed by Arellano and Bover (1995) and subsequently improved by Blundell and Bond (1998). The use of the system GMM is based on the notion that current values of the dependent variable is correlated with its past values. Exogenous and endogenous factors are included in this dynamic panel model together with the lag in the dependent variable. By shifting the lag dependent variable to the left and running the System GMM estimator on the modified model, the transformation is accomplished. Although the System GMM estimator is known to perform badly in finite samples, particularly when the variance ratio is high and the dependent variable is highly persistent, it is preferred over the Difference GMM estimator due to its

consistency and asymptotic greater efficiency. Regarding variables that display a “random walk” or are near random-walk variables, the System GMM estimate is likewise superior to the Difference GMM (Baum, 2006; Bond, 2002; Roodman, 2007). Roodman (2006) recommends against using Difference GMM estimate since it has a flaw that makes gaps more noticeable when applied to unbalanced panels. The general form of the system GMM model is presented as.

$$Y_{it} = \delta Y_{i,t-1} + x_{it}\beta + \varepsilon_{it} \quad (8)$$

where $i=1, \dots, N$ and $t=1, \dots, T$. Y_{it} is the dependent variable measuring investment and $Y_{i,t-1}$ represents the lag of the dependent variable. x_{it} is a vector of the explanatory variables and $\varepsilon_{it} = u_i + v_{it}$ for each $i=1, \dots, N$ and $t=1, \dots, T$. u_i is the fixed effect component and v_{it} represents the idiosyncratic error term. From equation 8, we estimate the effect of institutional quality indicators on private and government investment as.

$$\begin{aligned} private_{it} = & \alpha_0 + \beta_1 private_{i,t-1} + \beta_2 GOV_{it} + \beta_3 growth_{it} + \beta_4 reer_{it} + \beta_5 Privatecreit_{it} + \\ & \beta_6 cpi_{it} + \beta_7 trade_{it} + \beta_8 lendingrate_{it} + u_i + \eta_t + \varepsilon_{it} \end{aligned} \quad (9)$$

$$\begin{aligned} public_{it} = & \alpha_0 + \beta_1 public_{i,t-1} + \beta_2 GOV_{it} + \beta_3 growth_t + \beta_4 reer_{it} + \beta_5 Privatecreit_{it} + \\ & \beta_6 cpi_{it} + \beta_7 trade_{it} + \beta_8 lendingrate_{it} + u_i + \eta_t + \varepsilon_{it} \end{aligned} \quad (10)$$

where $t = 1, \dots, T$ and $i = 1, \dots, N$ where T and N denotes the number of time periods and number of countries respectively. $u_i, \eta_t, \varepsilon_{it}$ are the country effects, time effects and errors, respectively.

3.3. Data and sources

For our purpose, data from forty-one (41) sub-Saharan African nations were employed. Appendix 1 lists the nations that were included in the sample. The Fraser Institute database (Legal systems and enforcement of property rights) and the World Governance Indicators (political stability, control of corruption, voice and accountability, rule of law, effectiveness of government,) are the sources of data on institutional quality. The use of the selected economies is a result of data accessibility and target variable completeness. The information utilized was from 2002 to 2021. Other macroeconomic variables are sourced from WDI. While public investment is sourced from IMF investment and capital stock dataset.

Following Abotsi and Iyavarakul (2015), the variables from the world governance indicators are transformed from their original form which ranges from -2.5 to 2.5 . The formula $x = (a + 2.5) * 20$ where a is the value of the variable in its original scale, x is the value of the variable which has been transformed. This transformation ensures that the new variables of institutional quality indicators take the values 0 for the weakest and 100 for the strongest. Thus, the higher value indicates a better performance in the institutional quality indicators and vice versa. The variables used in the study are defined as follows:

private_{it}: The World Development Indicators database is the source of the private investment variable, which is defined as the ratio of private investment to GDP. It entails the total value of a manufacturer’s purchases, excluding the sales of durable assets over the course of the monetary cycle, plus certain increases to the value of non-manufactured assets (like subsurface assets or notable improvements in the quantity, prominence, or efficiency of land).

public_{it}: The data for the public investment is taken from the IMF investment and capital stock dataset. It is measured using general government fixed capital formation for both central and subnational governments as a ratio to GDP. Its computation includes investment grants, loan guarantees, tax concessions, public financial institutions' operations, and government backed saving schemes. The computation of the variables is found in Xiao et al. (2021).

Governance (Gov): The study employs six institutional quality indicators, as defined by Kaufman et al. (2009), to assess the quality of governance. These indicators include control of corruption, political stability, rule of law, voice and accountability, government effectiveness and regulatory quality. The WGI database was used as a measure of governance quality in this paper because it assesses the effectiveness and efficiency of government work using the following indicators: government effectiveness, regulatory quality, and the rule of law; additionally, it assesses the degree to which governments combat corruption and encourage citizen participation in politics using the following indicators: Political stability and absence of violence or terrorism control of corruption, and voice and accountability (Kaufmann et al., 2010). In addition to the six indicators sourced from the WDI, an index is created using all six indicators for further analysis. While these variables are sourced from the WGI database and widely used as measures of institutional quality indicators, another measure of governance (legal systems and property rights) is used for robustness purposes which is sourced from the Fraser institute. The rationale behind the use of several institutional quality indicators is in line with a growing body of research on the significance of disentangling governance assessments in order to prevent conceptual misunderstandings and improve policy relevance in Africa (Asongu & Odhiambo, 2020).

Legal systems and Property rights (Legal): This reflects the efficiency of the legal frameworks and the protection of property rights in the different studied countries. It gauges how much governments uphold the rule of law and how much private property rights are upheld by legal systems and regimes. It also assesses whether private property could be expropriated, the independence of the judiciary, judicial corruption, and the viability of contract enforcement for both private and commercial parties. Better legal protection of property rights is indicated by higher values (Gwartney et al., 2022). This is sourced from the Fraser institute.

Growth: In this paper, the economic growth rate is proxied using the annual rate of growth of Gross Domestic Product. The GDP of an economy is an important indicator of the health of an economy. The Gross Domestic Product (GDP) serves as a reliable indicator of the economic activity, income, and demand prevalent in a country. Higher GDP rates are expected to signal to investors that the economy is healthy and can generate enough demand for the products they produce. It is thus expected that the growth of the economy will positively influence the level of investment activities in an economy. It is sourced from the WDI.

Real Exchange Rate (reer): The rate at which the local currency of a nation is exchanged for one dollar at any given time is used to measure this. The World Development Indicators are the source of the exchange rate information. Real exchange rates are what we utilize. The competitiveness and profitability of private investment can be impacted by exchange rates, particularly for businesses that conduct business abroad or trade globally (Ayeni, 2020; Asteriou et al., 2016). A decline in the value of the national currency can increase the cost of imports and decrease the cost of exports, increasing demand and generating income for domestic businesses.

Private sector Credit (Privatecreit): This can be defined as the proportion of GDP that is allocated to the private sector in the form of domestic credit. It has also been used as a stand-in for the degree of financial development in other studies. It is anticipated that private investment requires

funding, and as a result, private credit and private investment should positively correlate (Ayeni, 2020). It is sourced from the WDI.

Inflation (cpi): In this study, inflation rate is measured as the annual change in the consumer price index of an economy. Higher values signify higher levels of inflation growth and vice versa. Even though moderate levels of inflation can increase the prices of investment assets in the long run, however, when inflation is very high, it negatively affects investment activity as investors lose confidence in the ability of the economy to sustain their businesses. It is thus expected that the relationship between inflation and private investment will be negative. It is sourced from the WDI.

Trade: The ratio of the total of imports and exports to GDP is how we calculate net trade. The “World Development Indicators database” is where this information originated. Trade is anticipated to have a positive correlation with the amount of private investment since it may provide an incentive for private investment (Acosta & Loza, 2005).

Lending rate: The average interest rate at which the private sector borrows money from official financial institutions is known as the lending rate. Greater values suggest greater borrowing costs, which may deter private investment. We use the annual real interest rate from the World Development Indicator database.

4. Results and discussion

This section presents the results of the models used in the study. The study examines the effect of institutional quality variables on investment activities in sub-Saharan Africa. Descriptive statistics of variables used in the study are presented in Table 1. The mean value of the institutional quality variables are as follows. Control of corruption has a mean value of 38.439, rule of law variable has a mean value of about 37.623, government effectiveness has a mean value of 36.053, political stability has a mean value of 39.42, regulatory quality has a mean value of about 38.299, voice and accountability have a mean value of 40.212. The average values of the institutional variables indicates that institutional development in the sub-region is relatively low, especially when minimum figures of 13.984 are recorded for political stability. It is worth noting that voice and accountability recorded the highest average rating in the sub-region while government effectiveness recorded the lowest average value. The sub-region is fraught with issues of political instability, increasing corruption, poor regulation of institutions, and bad management and in some instances, poor accountability and increasing poor press freedom ranking. The index of institutional quality indicators which is created as an arithmetic average of all the indicators also shows overall institutional quality indicators in the sub-region performs badly, as the mean value is about 38.341 with a minimum value of 15.467 and a maximum value of 67.514. Enforcement of property rights and Legal systems have a mean value of 4.125.

Table 1. Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
corruption	820	38.439	12.75	18.377	82.667
law	820	37.623	12.264	12.995	70.479
effective	820	36.053	12.066	12.253	73.218
stability	820	39.42	17.893	13.984	74.02
quality	820	38.299	10.83	12.881	73.939
voice	820	40.212	13.656	12.98	69.484
Governance	820	38.341	11.967	15.467	67.514
Legal	820	4.125	1.179	1.7	6.94
growth	820	4.154	4.684	-36.392	33.629
reer	820	103.883	17.727	59.54	216.9
Privatecredit	747	20.393	23.146	0	142.422
cpi	794	7.815	16.714	-8.975	382.816
Trade	763	69.814	35.452	0.757	225.023
lendingrate	778	16.941	3.016	14.518	25.038
public	820	2.661	4.646	0.01	25.86
private	730	22.579	8.897	3.462	81.021

The data indicates that investment expenditure as a percentage of gross domestic product in the sub-region is relatively low. The mean value of private investment expenditure in the sub-region is about 22.579 percent of GDP with a minimum value as low as 3.462 and a maximum value of about 81.021 percent of GDP. The data indicates that private investment in the sub-region is higher than public investment. While public investment expenditure has an average of about 2.661 and maximum of 25.86. Investment spending is a crucial metric for assessing the growth and development of the economy. An economy that invests more in capital goods is likely to invest more as a percentage of GDP, and this could eventually result in higher levels of productivity, employment, and income. This underscores the need to have higher investment spending in the sub-region. The mean value of economic growth rate is about 4.14 percent per annum while recording a maximum of about 33.629 percent. The mean value of the real exchange rate is about 103.883. Domestic credit to the private sector recorded a mean of about 20.939 percent of GDP. The inflation rate has averaged about 7.815 percent per annum reaching a high of about 382.81 percent per annum. Trade activities and lending rate have both averaged 69.814 percent per annum and 16.94 percent per annum, respectively.

In Table 2, the pairwise correlation matrix is presented. The correlation matrix shows the level of association between the variables used in the study. With the exception of the correlation between the institutional variables, the coefficients between the other independent variables are not very high to potentially cause issues of multicollinearity in the models. However, as expected, the correlation between the institutional variables seems to be quite high, indicating inclusion of all variables in a single model will cause collinearity problems. To avoid such issues, subsequent models are estimated individually, each time with a different measure of institutional quality.

Table 2. Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) corruption	1.000													
(2) law	0.883*	1.000												
(3) effective	0.871*	0.913*	1.000											
(4) stability	0.724*	0.788*	0.708*	1.000										
(5) quality	0.812*	0.882*	0.908*	0.703*	1.000									
(6) voice	0.710*	0.794*	0.726*	0.694*	0.734*	1.000								
(7) Governance	0.913*	0.962*	0.930*	0.869*	0.913*	0.858*	1.000							
(8) growth	0.009	0.007	0.036	0.011	0.012	0.021	0.017	1.000						
(9) reer	-0.195*	-0.162*	-0.160*	-0.218*	-0.146*	-0.200*	-0.203*	-0.038	1.000					
(10) credit	0.514*	0.571*	0.636*	0.359*	0.651*	0.571*	0.591*	-0.107*	-0.007	1.000				
(11) cpi	-0.125*	-0.110*	-0.118*	-0.148*	-0.169*	-0.142*	-0.150*	-0.052	0.019	-0.088*	1.000			
(12) Trade	0.436*	0.349*	0.386*	0.479*	0.295*	0.278*	0.416*	-0.012	-0.177*	0.171*	-0.105*	1.000		
(13) lendrat	-0.006	-0.027	0.011	0.012	-0.012	-0.035	-0.009	0.041	-0.220*	-0.125*	0.062	-0.040	1.000	
(14) Legal	0.753*	0.812*	0.762*	0.632*	0.723*	0.715*	0.793*	0.056	-0.123*	0.549*	-0.035	0.237*	-0.219*	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.1. Effect of institutional variables on investment in sub-Saharan Africa

4.1.1. Private investments

Table 3 presents dynamic models of the effect institutional variables on private investment in sub-Saharan Africa. A two-step system Generalized Method of Moments (Sys-GMM) model is employed given its ability to account for potential endogeneity. Seven models of institutional quality on private investment are estimated. The efficiency of the GMM estimator is predicated on the confirmation of two theories: The instruments' validity and the lack of error autocorrelation (Bond, 2002). We use first- and second-order autocorrelation tests as well as the Hansen/Sargen test to evaluate the validity of the instruments. The result for the tests indicates the models do not suffer from second order autocorrelation and overriding restrictions/ or the instruments used are valid (see Table 3).

For each model, the measures of institutional quality are control of corruption, rule of law, government effectiveness, political stability, regulatory quality, voice and accountability, and an index of institutional quality, respectively. These are estimated sequentially and not simultaneously. The theoretical hypothesis that emphasizes the significance of institutional quality indicators in determining investment attractiveness in developing nations is supported by the system GMM approach's outcomes. We thus, reject the hypothesis of no significant relationship between institutional quality variables and private investment. The results indicate that private investment in the sub-region is positively influenced by institutional quality indicators. This result is supported by previous literature (see Bakari & Benzid, 2021; Iheonu, 2019; Zakharov, 2019; Ouedrago & Kouaman, 2014).

Table 3. Impact of institutional quality indicators on private investment.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.private	0.793*** (0.0265)	0.799*** (0.0264)	0.831*** (0.0258)	0.804*** (0.0265)	0.804*** (0.0259)	0.799*** (0.0258)	0.798*** (0.0262)
corruption	0.0435*** (0.0130)						
law		0.0350*** (0.0115)					
effective			0.0235** (0.0111)				
stability				0.0150* (0.00809)			
quality					0.0283** (0.0136)		
voice						0.0291** (0.0142)	
Governance							0.0392*** (0.0124)
growth	0.105** (0.0458)	0.0954** (0.0456)	0.150*** (0.0499)	0.0944** (0.0448)	0.0907* (0.0467)	0.0944** (0.0461)	0.0935** (0.0456)
reer	-0.0122 (0.0118)	-0.0147 (0.0125)	-0.00785 (0.0131)	-0.0154 (0.0134)	-0.0158 (0.0128)	-0.0112 (0.0122)	-0.0138 (0.0124)
Privatecredi	-0.0162** (0.00631)	-0.0168** (0.00765)	-0.0144** (0.00613)	-0.0122*** (0.00408)	-0.0168*** (0.00601)	-0.0178*** (0.00645)	-0.0180** (0.00705)
cpi	0.0415** (0.0193)	0.0390* (0.0203)	0.0299 (0.0278)	0.0388* (0.0199)	0.0421** (0.0197)	0.0429** (0.0196)	0.0420** (0.0199)
Trade	-0.00384 (0.00628)	-0.00159 (0.00606)	-0.00267 (0.00626)	-0.000722 (0.00655)	0.000447 (0.00612)	0.00137 (0.00601)	-0.00210 (0.00625)
lendingrate	-0.235*** (0.0762)	-0.221*** (0.0769)	-0.213* (0.126)	-0.235*** (0.0785)	-0.231*** (0.0756)	-0.224*** (0.0772)	-0.235*** (0.0765)
Constant	7.864*** (2.295)	8.050*** (2.384)	6.935** (2.777)	8.852*** (2.582)	8.279*** (2.349)	7.706*** (2.440)	8.057*** (2.373)
Observations	550	550	523	550	550	550	550
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Instruments	26	26	26	26	26	26	26
Groups	38	38	38	38	38	38	38
AR1 (P-Value)	0.0425	0.0417	0.0441	0.0412	0.0419	0.0425	0.0416
AR2 (P-Value)	0.211	0.218	0.235	0.204	0.219	0.208	0.212
Hansen-J (P-Value)	0.335	0.340	0.318	0.354	0.349	0.342	0.330

Robust Standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.010

Control of corruption has a positive significant influence on private investment expenditure in sub-Saharan Africa. A percentage increase in the level of corruption control increases the level of private

investment in sub-Saharan Africa by about 0.0435. The result underscores how crucial governance is in determining the economic dynamics of the region. It not only emphasizes how economically significant it is to promote responsible and transparent governance, but it also makes the case that measures taken to improve anti-corruption efforts may serve as stimuli and retainers of private capital. Investor uncertainty is decreased when there is greater transparency and predictability in the corporate environment due to improved corruption control. Since strong anti-corruption measures demonstrate a commitment to fair procedures, legal protection, and general stability, they can also result in increased investor trust. This result corroborates the findings of Iheonu (2019) and Zakharov (2019).

The results also show that a percentage point increase in the level of rule of law increases investment in the sub-region by about 0.0350 percent. This finding implies that strengthening the rule of law could work as a stimulant to draw in private investment in sub-Saharan Africa, where issues with governance and legal institutions have frequently emerged. This may be transmitted through improved protection of property rights, decreased corruption, and heightened investor trust in the legal system. Increasing the rule of law in sub-Saharan Africa may help create a more welcoming business climate, which will attract investment and eventually support the region's sustainable economic growth. The results further show that government effectiveness increases private investment in the sub-region. A percentage point increase in the level of government effectiveness increases private investment in the sub-region by about 0.0235 percent. This result implies that increasing the efficiency of government could act as a trigger to encourage participation from the private sector. Reductions in administrative obstacles, a more stable and predictable regulatory environment, and enhanced investor confidence as a result of more accountable and transparent administration could all be transmission mechanisms at work. These results highlight how crucial sound governance is to promote economic growth and drawing in outside capital to the sub-Saharan African region. This is consistent with the findings of Le and Rishi (2010) and Asongu et al. (2021).

The result further shows that regulatory quality has a significant positive effect on investment in sub-Saharan Africa. A percentage point increase in regulatory quality is associated with a 0.0283 percent increase in private investment. Increased private sector participation and capital inflows can be sparked by an efficient regulatory framework in sub-Saharan Africa, where several obstacles frequently inhibit economic growth. This beneficial effect may be transmitted through a variety of channels, such as increased investor confidence, decreased company risks, and general improvements in the ease of doing business. Additionally, by fostering a stable and predictable economic climate, a well-regulated environment can draw in both domestic and foreign investment. Moskalkenko et al. (2022) also find similar results.

Political stability, and voice and accountability both positively influence private investment in sub-Saharan Africa. The results indicate that a percentage point increase in each of the variables is associated with a 0.0150 and 0.0291 percent increase respectively in investment in sub-Saharan Africa. The findings highlight the potential role that stability and responsible governance may play in drawing in private investment to sub-Saharan Africa, where political unrest and issues with governance have traditionally hindered economic growth. A more favorable investment climate in the region may be fostered through transmission mechanisms that include increased investor confidence in a stable political environment, lower risks, and better prospects for rewards. The results highlight how crucial it is to deal with governance concerns in order to encourage and draw in private investment in sub-Saharan Africa. This confirms the findings of Moskalkenko et al. (2022) and Asongu et al. (2021).

For the other control variables included in the models, the results indicate economic growth rate has a positive influence on private investment. Economic growth plays a pivotal role in increasing private investment through various interconnected mechanisms. A growing economy sends a signal of expanding

market opportunities and increasing consumer demand. It is also result in increased investor confidence since a robust and growing economy is perceived as a friendly environment for business operations and a conducive macroeconomic environment. This result is consistent with the findings of AMBE (2013). Credit to the private sector and the lending rate both negatively affect private investment. Since high loan rates raise the cost of borrowing, they can deter private investment. Businesses pay more for loans when interest rates are higher, which lowers their profitability and return on investment. This deters businesses from taking on further debt in order to make investments. Due to the higher cost of servicing higher-interest loans, businesses may decide to postpone or reduce their investment plans, which further contributes to an unfavorable business climate. We also argue that in sub-Saharan African countries where the government is a significant borrower from the domestic economy, the crowding out effect of private investments could occur. Competition from governments increases rates of interest on credit and therefore crowding out the private sector. This result corroborates the findings of Erden and Holcombe (2006), Obudah and Tombofa (2013). Inflation, however, positively influences private investment.

4.1.2. Public investment

In Table 4, the effect of institutional quality indicators on public sector investment is examined using a system GMM. Tests for second order autocorrelation and overriding restrictions are rejected according to results of the AR and Hansen J statistics.

The results show that institutional quality indicators have a significant negative effect on public investment in sub-Saharan Africa countries. We reject the hypothesis of no significant relationship between institutional quality variables and public investment. Using all the seven indicators of institutional quality, we find the effect to be negative throughout all the models under consideration. We find that control of corruption (0.0820), rule of law (0.066), government effectiveness (0.0395), political stability (0.0668), regulatory quality (0.0688), voice and accountability (0.0961), and the index of governance (0.0961) all reduce public investment, respectively. The results corroborate the findings of Grigoli and Mills (2014) who also find a significant negative relationship between institutional quality variables and public investment and attribute this relationship to the fact public investment is used as a vehicle by governments for rent seeking in sub-Saharan Africa. Mohammed and Karagöl (2023) also asserts that public investment in SSA may be influenced by factors such as political alliances, corruption and rent seeking which could play a significant role in reducing the efficiency and productivity of public expenditure. Therefore, enhancing institutional quality might not always result in more public investment—it might even decrease it if it limits the chances for public officials to extract rent. This assertion is also supported by Keefer and Knack (2007) who argue that governments use public spending as a vehicle to increase their rent seeking and that public investment could also increase when institutional quality reduces and therefore suggest that any effort to improve institutional quality reduces public investment.

The foregoing discussions indicate that public investments may be impacted by inefficiency, corruption, and bureaucratic roadblocks brought on by bad governance, particularly in developing nations. Maybe the negative coefficients of the institutional variables give a sign that the public investments are a vehicle to organize the corruption and inefficiency of the government. In these instances, a focus on reducing unnecessary spending and increasing efficiency may be linked to decreases in public investment and increases in governance metrics.

An improvement in institutional quality metrics may indicate more accountability and scrutiny, which, if projects are put through more stringent review and monitoring procedures, may result in a

decrease in public spending. The study also finds that exchange rate positively affects public investment. This could result from the fact that might improve a country's fiscal space allowing for increased public spending on infrastructure, education, healthcare, and other investment areas. Trade also reduces public investment. Sub-Saharan African countries heavily reliant on imports for trade may face fiscal pressures. If trade activities lead to a surge in imports, governments may need to allocate funds to cover trade imbalances, potentially reducing the budget available for public investment. The discussions of the other control variables correspond to the discussion indicated in Table 3.

Table 4. Impact of institutional quality indicators on public investment.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.public	0.119*** (0.0112)	0.113*** (0.0107)	0.159*** (0.0110)	0.0150* (0.00843)	0.0849*** (0.00951)	0.0769*** (0.00828)	0.0981*** (0.00806)
corruption	-0.0820*** (0.0202)						
law		-0.0666*** (0.0204)					
effective			-0.0395*** (0.0119)				
stability				-0.0668*** (0.00755)			
quality					-0.0688*** (0.0190)		
voice						-0.0583*** (0.0107)	
Governance							-0.0961*** (0.0147)
growth	0.296*** (0.0204)	0.291*** (0.0206)	0.184*** (0.0142)	0.327*** (0.0185)	0.345*** (0.0262)	0.296*** (0.0207)	0.304*** (0.0208)
reer	0.00438 (0.00398)	0.00950*** (0.00219)	0.0112*** (0.00255)	0.0104*** (0.00224)	0.0104*** (0.00301)	0.00445 (0.00277)	0.00668*** (0.00229)
Privatecredit	0.0971*** (0.00616)	0.104*** (0.00491)	0.0834*** (0.00638)	0.106*** (0.00512)	0.105*** (0.00824)	0.101*** (0.00502)	0.110*** (0.00608)
cpi	0.154*** (0.0103)	0.152*** (0.0122)	0.141*** (0.0123)	0.155*** (0.0116)	0.150*** (0.0131)	0.152*** (0.0102)	0.151*** (0.0113)
Trade	-0.0232*** (0.00484)	-0.0250*** (0.00478)	-0.0296*** (0.00427)	-0.0216*** (0.00511)	-0.0337*** (0.00558)	-0.0322*** (0.00480)	-0.0235*** (0.00491)
lendingrate	-0.192*** (0.0430)	-0.168*** (0.0415)	-0.331*** (0.0293)	-0.158*** (0.0418)	-0.199*** (0.0446)	-0.189*** (0.0435)	-0.165*** (0.0433)
Constant	5.194*** (1.632)	3.658** (1.373)	5.882*** (0.634)	3.326*** (1.158)	4.523*** (1.133)	4.887*** (1.335)	4.793*** (1.272)
Observations	567	567	538	567	567	567	567
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Continued on next page

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Instruments	26	26	26	26	26	26	26
Groups	38	38	38	38	38	38	38
AR1 (P-Value)	0.00207	0.00185	0.00570	0.00222	0.00187	0.00190	0.00215
AR2 (P-Value)	0.165	0.172	0.211	0.187	0.111	0.193	0.175
Hansen-J (P-Value)	0.122	0.147	0.138	0.180	0.202	0.178	0.164

Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Robustness Checks

In Table 5, the effect of institutional variables on private and public investment is again tested using a different measure of an institutional variable. In this case, property rights and the legal systems index are applied. The variable quantifies the degree to which governments uphold the laws and the legal systems/regimes protect private property rights. Additionally, it evaluates the possibility of expropriation of private property, the judiciary's independence, corruption in the judiciary, and the practicability of contract enforcement for both private and commercial parties. Initial tests of the two-step system GMM indicate that instruments are properly identified and also there is no issue of second order autocorrelation (see Table 5).

The findings show that property rights enforcement and legal frameworks significantly boost private investment in sub-Saharan Africa. A 0.492 percent rise in the level of private investment in SSA is correlated with a percentage point increase in the development of legal systems and the enforcement of property rights. The results confirm earlier results in Table 3 When various measures of institutional quality are used in estimation. Furthermore, the results show how important it is to have a strong legal system in place to foster economic activity, especially in a region where issues with institutional quality and governance are frequently prevalent. In sub-Saharan Africa, where property rights and legal safeguards are uncertain and can act as a deterrent to investment, a strong legal system can boost investor confidence and encourage long-term initiatives. The favorable outcome that has been seen can be ascribed to the guarantee of property rights, which lowers the risk involved in investments and raises the possibility of profits. A more favorable climate for capital accumulation, lowered risk premiums, and boosted investor confidence are all potential transmission mechanisms that could support long-term private investment in the region. This corroborates Asongu et al. (2021).

Conversely, we find that property rights enforcement and legal systems reduces public investment. Specifically, a percentage point increase in the level of development of legal systems and enforcement of property rights is associated with a 0.427 percent decrease in the level of public investment in SSA. This is consistent with Keefer and Knack (2007), Grigoli and Mills (2014), and Mohammed and Karagöl (2023).

Table 5. Impact of legal systems and property rights enforcement on private and public investment.

Variables	Private	Public
L.private	0.793***(0.0252)	0.133***(0.009)
Legal	0.492***(0.175)	-0.427**(0.1794)
growth	0.0951**(0.0453)	0.313***(0.0226)
reer	-0.0183(0.0140)	0.011***(0.0023)
Privatecredit	-0.0220***(0.00719)	0.092***(0.0076)
cpi	0.0395*(0.0199)	0.152***(0.0114)
Trade	0.0001(0.00598)	-0.031***(0.0051)
lendingrate	-0.196**(0.0765)	-0.222***(0.0482)
Constant	7.469***(2.496)	4.199***(1.466)
Observations	550	567
No. of Instruments	26	26
AR1 (P-Value)	0.0419	0.002
AR2 (P-Value)	0.202	0.157
Hansen-J (P-Value)	0.372	0.108

Robust Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

5. Conclusion and recommendations

Africa's governance has long been perceived as poor due to the prevalence of political unrest, corruption, and a poor enforcement of the rule of law in most of the continent's nations. Additionally, it has been suggested that, in both rich and emerging countries, governance plays a crucial role in explaining the dynamics of macroeconomic aggregates. This study, therefore, examined the impact of institutional quality variables on investment in sub-Saharan Africa. Employing a panel of 41 SSA countries, seven different measures of institutional variables are proxied to determine their effect on private and public investment. These include, control of corruption, rule of law, government effectiveness, political stability, regulatory quality, voice and accountability. Additionally, the Fraser institute index for legal system and property right enforcement is employed for robustness checks. The results of the system GMM shows that all seven (7) proxies of institutional quality have significant positive effect on private investment and significant negative effect on public investment in the sub-region. The study thus supports the theoretical assumption institutional quality indicators could significantly influence private investment attractiveness developing countries. Quality institutions are expected to reduce the costs involved in doing business in an economy, and thus increase investment in the economy. We also argue that public investments are used as vehicles by governments for rent seeking in sub-Saharan Africa, such that an improvement in institutional quality may indicate more accountability and scrutiny on projects and thus, reducing the opportunity to rent seek and invariably the amount of public investment.

The findings demonstrate how important institutional quality parameters are in influencing private and public investment in the region. Private investment is positively impacted by the following factors: political stability, efficacy of the government, voice and accountability, quality of regulations, and control of corruption. Furthermore, lending rates and credit to the private sector have a negative

impact on private investment, but economic growth has a positive effect. On the other hand, inflation encourages private investment. However, public investment is reduced by the improvements in all institutional quality indicators, and this is attributed to the tendency of governments using public investment for rent seeking. As such when regulations and accountability are improved, it exposes the inefficiencies in public investment leading to a reduction. We emphasize how crucial it is to develop legal frameworks, solve issues with transparency in governance, and promote economic growth in order to attract long-term private investment in sub-Saharan Africa.

Based on our findings, it is recommended that governments of sub-Saharan African countries improve public service delivery, reduce corruption to enhance the efficacy of government, promote transparency and citizen participation in governance, simplify business regulations, reduce bureaucratic hurdles, strengthen anti-corruption measures, promote transparency in public procurement processes, and invest in infrastructure, education, and healthcare. It is recommended that governments explore opportunities for public-private partnerships to leverage private sector expertise and investment in public projects. Collaborative initiatives can help optimize resource allocation and improve project outcomes. Lending rates should also be reduced and an increase in credit availability to the private sector.

We do not include global conditions and geopolitical events which could alter the course of infrastructure investment in the region. Further studies could attempt understanding how well-resourced economies could influence investments in the sub-Saharan region with the aim of gaining longer time political influence.

Use of AI tools declaration

The authors affirm that no artificial intelligence (AI) tools were used in the creation of this work.

Conflict of interest

The authors declare no conflicts of interest in this paper.

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