

INSTITUTIONAL QUALITY, BOND MARKET AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICAN COUNTRIES

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Abstract

Economic growth remains a universal aspiration of nations as it creates jobs, raises incomes, fosters innovation, and supports industrial and infrastructural advancement. This study examines the nexus between institutional quality, bond markets, and economic growth in 55 SSA countries from 1998 to 2023, while controlling for exchange rate volatility. Using annual panel data from the World Bank's World Development Indicators, the analysis employed panel regression techniques supplemented with fully modified ordinary least squares (FM-OLS) and dynamic ordinary least squares (DOLS) for robustness. Institutional quality was measured through a composite index incorporating government effectiveness, corruption control, political stability, and regulatory quality, alongside bond market indicators of yield and value. The findings reveal that government effectiveness and bond value significantly enhance growth, while regulatory quality and political stability exert negative effects. Control of corruption is positively but insignificantly related to growth, and bond yield has a negative, insignificant impact. Crucially, the interaction between institutional quality and bond market development is positive and significant. The study underscores the importance of strong governance and deepened bond markets in advancing sustainable economic growth in SSA.

Keywords: Bond Price, Control of Corruption, Regulatory Quality, Bond Yield, And SSA Countries.

1. INTRODUCTION

Economic growth remains a universal aspiration of nations as it creates jobs, raises incomes, fosters innovation, and supports industrial and infrastructural advancement (Bamforth, 2022). Achieving this goal, however, requires effective policies and strong institutions. Institutional quality, which embodies efficiency, fairness, and effectiveness of legal, political, and economic systems, determines incentives, property rights, governance, and corruption control, thereby shaping development outcomes. Strong institutions foster investment, innovation, and entrepreneurship (Abubakar, 2020), while

weak institutions encourage instability and corruption (Fainshmidt, Judge, Aguilera, & Smith, 2018; Rodríguez-Pose & Ketterer, 2019). North (1990) aptly described institutions as the “rules of the game” guiding social, political, and economic interactions. Empirical evidence confirms that institutional effectiveness supports property rights protection, political stability, financial access, and inclusiveness (Muriu, 2020; Samadi & Alipourian, 2021; Seyingbo & Adeniyi, 2018).

Bond markets also play a critical role in development by providing long-term capital for infrastructure, technology, and enterprise expansion. The World Bank (2006) identified size, access, efficiency, and stability as key dimensions through which bond markets contribute to growth.

Efficient and liquid markets attract investment, enhance financial stability, and deepen capital formation (Nkwede et al., 2016; Chung, Kim, & Lee, 2020). Two perspectives explain the finance growth relationship: the supply-leading view, which posits that bond market development spurs growth by mobilizing savings and improving governance (Peia & Roszbach, 2015; Samargandi, Fidrmuc, & Ghosh, 2014), and the demand-following view, which argues that growth drives financial deepening.

Exchange rate volatility complicates this relationship by raising interest rates, depressing bond prices, and pushing investors toward safer assets, thereby constraining productive investment (Ogboi et al., 2016).

Literature on the subject remains fragmented. Some studies examine institutions and growth (Aluko & Ibrahim, 2020; Doumbia, 2018), while others analyze bond markets (Olaniyan & Ekundayo, 2019; Nkwede et al., 2016). Few studies integrate the three dimensions of institutions, bond markets, and growth in Sub-Saharan Africa (SSA), despite the region’s shallow and illiquid bond markets.

Excluding South Africa, most SSA markets are poorly developed, with market capitalization ratios far below global standards (Mu et al., 2013; Machokoto et al., 2020). Institutional weaknesses rooted in colonial legacies, resource dependence, political competition, and ethnic fragmentation further undermine governance and growth.

The combination of fragile institutions and underdeveloped markets perpetuates underdevelopment, making reforms essential. This study addresses the gap by examining the interplay between institutions, bond markets, and growth in SSA through the Pesaran et al. (2001) ARDL model, supplemented with FM-OLS and DOLS to control endogeneity, heterogeneity, and cross-sectional dependence.

Institutional quality is measured through an index incorporating government effectiveness, corruption control, political stability, and regulatory quality. This integrated framework provides new evidence on how institutional and financial structures jointly affect growth, offering insights for targeted reforms.

Sustainable development in SSA requires more than market forces. Strong institutions foster accountability and inclusiveness, while robust bond markets mobilize long-term capital and build investor confidence. Yet persistent corruption, weak governance,

shallow financial systems, and recurrent exchange rate instability constrain progress (Agoba et al., 2017). Structural deficiencies such as poor regulation, inadequate infrastructure, illiquidity, and weak investor confidence continue to undermine SSA's bond markets (Dudzich, 2020; Gadinecz, Miyajima, & Shu, 2018). Currency volatility further raises borrowing costs and deters participation, while political risks and transparency failures discourage both domestic and foreign investors (Akinsokeji et al., 2016).

Addressing these challenges requires coordinated reforms to strengthen institutions, deepen bond markets, and stabilize macroeconomic conditions. Only then can SSA harness the synergies between institutions, finance, and growth. By investigating this nexus, the study contributes to strategies for overcoming structural barriers and unlocking pathways to long-term economic transformation (Lawal et al., 2024).

Based on the foregoing, the broad objective of this study is to examine the nexus between institutional quality, bond markets, and economic growth in Sub-Saharan African (SSA) countries, while controlling for exchange rate volatility. Particular attention is given to the effects of government effectiveness, control of corruption, political stability, bond yield, and bond price growth. The study also considers the interactive impact of the institutional quality index and bond market indicators on economic performance.

Sub-Saharan Africa, classified by the United Nations as the geographical region south of the Sahara, consists of 55 countries, including Nigeria, South Africa, Kenya, Ghana, Ethiopia, and others. Although the continent is divided into five regions East, Central, North, Southern, and West Africa, this study focuses specifically on SSA due to the region's fragile financial systems and institutional weaknesses. The analysis relies on annual panel data covering 1998 to 2023 from the World Bank's World Development Indicators (WDI), with country selection based on the availability of relevant data.

Existing evidence highlights the significant influence of institutions and bond markets on economic growth, yet controversies remain, particularly within SSA. Governments in the region face persistent macroeconomic challenges that obstruct growth pathways. The findings of this study are therefore expected to be valuable to policymakers, investors, scholars, and firms.

For governments, the results will provide insights into how institutional quality shapes development and guide strategies for managing institutional and financial constraints. For investors, the study offers a deeper understanding of bond market portfolios, associated risks, and strategies to enhance returns in a volatile environment.

The study also contributes to academic literature by addressing gaps in monitoring trends in investment, trade, and macroeconomic performance within SSA's precarious economic landscape. It will help scholars answer persistent questions on how institutional quality and bond markets interact with growth dynamics. Finally, the study provides firms with knowledge on SSA's institutional frameworks, bond market behavior, and exchange rate fluctuations, enabling them to make informed decisions on capital accumulation, investment, and long-term growth strategies.

2. REVIEW OF RELATED LITERATURE

The framework for this study is captured by figure 1 below:

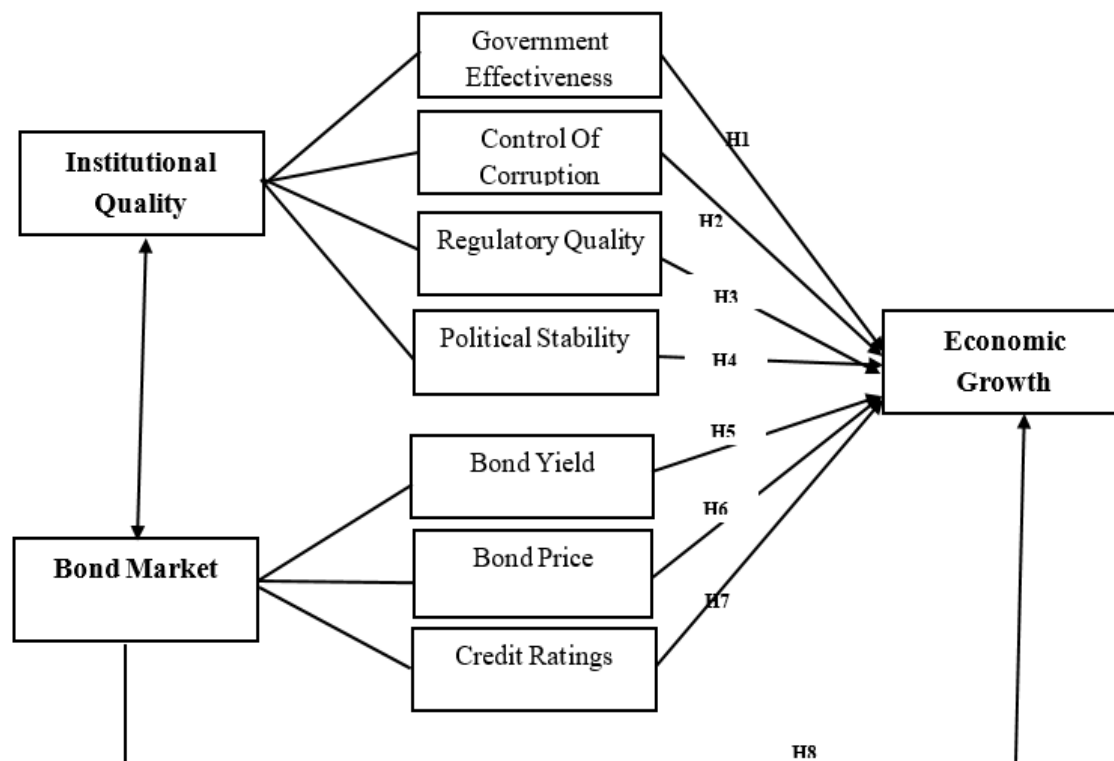


Figure 1: Conceptual Framework on Institutional Quality, Bond Market and Economic Growth

Source: Researcher's Conception (2025)

Figure 1's conceptual framework illustrates the connection between institutional quality, the bond market, and economic growth. Establishing trust among market participants, promoting investment, and upholding the rule of law all depend on robust institutions. By serving as a crucial intermediary between savers and borrowers, the bond market enables governments and businesses to generate funds for a range of initiatives. A healthy bond market can support liquidity, offer reliable financing options, and give important indicators of the state of the economy as a whole. There is a complex and multidirectional relationship between economic growth, the bond market, and institutional quality. These are subsequently discussed in the following sections.

Traditional Economic Theory, rooted in Fisher and Keynes, explains that bond yields are shaped by supply and demand, with an inverse link between yields and prices (Costa Junior et al., 2022; Nneji, 2020). In efficient markets, yields reflect interest rates, inflation, and credit risks (Hon, Moslehpour, & Woo, 2021). In Sub-Saharan Africa, strong institutions can lower risks, stabilize bond markets, and attract investment (Ozekhome,

2022). By reducing yields and borrowing costs, effective institutions channel resources into innovation, infrastructure, and jobs. Weak governance, however, raises yields, deters investment, and constrains growth.

Institutional Theory, advanced by North, stresses that legal frameworks, property rights, and enforcement shape economic outcomes (Dzionek-Kozłowska & Matera, 2021; Arshed et al., 2022). Strong institutions improve predictability, reduce costs, and build trust, creating an enabling environment for markets (Ehigiamusoe & Samsurijan, 2020). In SSA, governance indicators such as effectiveness, anti-corruption, regulation, and political stability drive investor confidence and efficiency (Boly & Gillanders, 2023; Pan et al., 2020). Thus, better institutions help attract bond investment, diversify economies, and mitigate volatility.

Empirical evidence shows mixed outcomes. Ragmoun (2023) linked strong institutions to entrepreneurship in developed economies, though unemployment remained a constraint. Warsame et al. (2023) found that institutions and capital drive Somalia's long-run growth, while Mehmood et al. (2022) showed that accountability and corruption control stimulate South Asian growth despite short-run differences. In West Africa, Iheonu et al. (2017) highlighted corruption control and regulatory quality as growth drivers. Nigeria-specific studies also diverge: Abubakar (2020) found positive institutional effects, while Utile et al. (2021) reported negative impacts, showing the persistence of inefficiencies. Broader studies across Africa (Adegboye et al., 2020; Aluko & Ibrahim, 2020) confirm that institutions shape FDI and financial markets, while ECOWAS evidence (Akpan, 2020; Abbe, 2019) links governance to inclusiveness and employment outcomes.

Outside Africa, institutional effects remain diverse. Yildirim and Gokalp (2016) showed that legal integrity promotes growth in Turkey, while instability hinders it. European studies (Pluskota, 2020; Gründler & Potrafke, 2019; Cieřlik & Goczek, 2018) found corruption often undermines growth and investment. Sabir et al. (2019) showed institutions attract FDI more effectively in developed economies, while Afolabi (2019), Glawe and Wagner (2019), and Radzeviča and Bulderberga (2018) emphasized governance dimensions as key growth determinants, with regional variations.

Bond markets also play a central role. Nneka et al. (2022) reported mixed effects of government and corporate bonds, while Chidi-Okeke et al. (2022) and Oke et al. (2021) found Nigeria's bond market contributed little to growth, with corporate bonds showing limited positive impact. Internationally, Wahidin et al. (2021) revealed that the global financial crisis disrupted bond-growth links, while Pradhan et al. (2020) established long-run causality between bond and stock markets and growth in G-20 countries. Hartley and Rebucci (2020) highlighted how quantitative easing shapes bond yield, illustrating their sensitivity to shocks. Structural and institutional weaknesses continue to constrain bond markets in emerging economies. Smaoui et al. (2017) and Berensmann et al. (2015) underscored the importance of economic size, banking depth, trade openness, and regulation. Nigerian evidence (Akinsokeji et al., 2016; Ogboi et al., 2016) found weak direct effects of bond markets on growth, though indirect links through savings and

investment were noted. Similar findings emerged in Kenya (Ngaruiya & Njuguna, 2016) and sovereign credit rating studies (Chen et al., 2016).

Taken together, the literature shows that institutional quality consistently shapes growth, though mechanisms remain underexplored in SSA. Bond markets also have growth potential but are limited by weak institutions, shallow systems, and exchange rate volatility. Strengthening governance, improving regulatory quality, and tackling corruption remain critical for unlocking both growth and bond market development in the region.

The literature reveals a complex interplay between institutions, exchange rate volatility, bond markets, and economic growth. Some studies highlight positive impacts, while others suggest adverse effects. On institutions, Aluko and Ibrahim (2020), Smaoui et al. (2017), Doumbia (2018), and Kouton (2019) found significant positive influences, whereas Jeleta and Takyii (2017) and Agoba et al. (2017) reported negative effects. Bond market findings are also mixed. Olaniyan and Ekundayo (2019), Akinsokeji et al. (2016), Ogboi et al. (2016), Dudzich (2020), and Pradhan et al. (2018) emphasized the positive role of bond markets in fostering growth. In contrast, Nkwede et al. (2016) and Grandanecz, Miyajima, and Shu (2018) associated bond markets with negative growth outcomes.

Similarly, institutional quality and exchange rate volatility show divergent outcomes. While Okoro and Charles (2019), Janus and Riera-Crichton (2015), Morina et al. (2020), Balima et al. (2018), and Sibanda et al. (2018) observed adverse effects of institutional quality, studies such as Alagidede and Ibrahim (2016), Bahmani-Oskooee and Galdan (2018), Jibrin et al. (2017), Inam and Umobong (2015), Oloyede and Fapetu (2018), and Ullah et al. (2017) found positive links between exchange rate volatility and growth. Given these inconsistencies, this study investigates the nexus between institutions, bond markets, and economic growth in Sub-Saharan Africa. Unlike earlier works that examined these relationships separately, this study adopts a holistic approach using an Institutional Quality Index (IQI) comprising regulatory quality, rule of law, government effectiveness, political stability, voice and accountability, and corruption control to provide deeper insights into the region's growth dynamics.

3. DATA AND METHODS

This research adopts secondary data, drawing on the World Bank's World Development Indicators (WDI) for the period 1998-2023. This specific timeframe is chosen due to data availability within the WDI. The WDI offers a comprehensive collection of indicators encompassing institutional quality, bond market and economic growth of Sub-Saharan African Countries. By utilizing this robust dataset, the study can analyze trends, identify correlations, and ultimately shed light on the relationships between the variables under investigation.

The study was conducted selecting 55 Sub-Saharan African countries. The selection of the countries was based on the availability of data for the period of 1998 to 2023. According to the World Bank, sub-Saharan Africa is the area and regions of the African

continent that lie south of the Sahara. These include Central Africa, East Africa, Southern Africa and West Africa. Geopolitically, in addition to African countries and territories that are fully located in this specified region, the term may also include state bodies that have only part of their territory located in this region, as defined by the United Nations (UN). This is considered a non-standardized geographic region with the number of countries included ranging from 46 to 48 depending on the organization describing the region (e.g. UN, WHO, World Bank, etc.). The African Union (AU) uses a different regional division, recognizing all 55 member states on the continent – grouping them into five distinct and standard regions. This study is therefore limited to 55 selected countries in sub-Saharan Africa, which include Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Equatoria Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory-Coast, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe. This study was carried out by analyzing the nexus between the institutional quality, the bond market, and economic growth in Sub-Saharan Africa using the basic Panel Regression method. We adopted this model because the main reason we would have opted for the autoregressive distributed lag (ARDL) model was its ability to handle dynamic relationships and predict long-run effects. These key takeaways were already embedded in our data characteristics as they were all stationary and integrated at order zero 1(0). The panel fully modified ordinary least squares (FM-OLS) and dynamic ordinary least squares (DOLS) would be used as the robustness check model. Early introduction of panel estimation methods includes the work by Airy in 1861 for the analysis of astronomical data through the works on human heredity by Galton and Fisher and the development of fixed effects ANOVA by Fisher and his disciples (Nerlove, 2002). Other works include those of Mundlak (1978) on the pooling of time series and cross-sectional data, who further developed the fixed effects, and that of Hausman (1978), who introduced the Hausman test for distinguishing between fixed and random effects. The peculiarity of this model is its ability to account for individual-specific effects that are either fixed or random, thus allowing for the estimation of time-invariant variables. The model for the relationships that exist between institutional quality, bond market, and economic growth in Sub-Saharan Africa is specified as follows.

$$\begin{aligned}
 GDPPCGRWTH_{t,i} &= \beta_0 + \beta_1 InIQI_{t,i} + \beta_2 GEFFVNS_{t,i} + \beta_3 COCORRUP_{t,i} + \beta_4 RQUAL_{t,i} \\
 &+ \beta_5 PSTAB_{t,i} + \beta_6 BNDINTR_{t,i} + \beta_7 BONDVALUE_{t,i} \\
 &+ \beta_8 \frac{M3}{GDP_{t,i}} + \beta_9 INFL_{t,i} + \beta_{10} INTR_{t,i} + \alpha_i + GDPPCGRWTH_t + \varepsilon_{t,i} \\
 &--- (1)
 \end{aligned}$$

Where β_0 is the constant, β_1 to β_7 represents the coefficients, GDPPCGRWTH represents the real gross domestic product, IQI is the institutional quality index, GEFFVNS is the government effectiveness, COCORRUP is the control of corruption, RQUAL is regulatory quality, PSTAB is the political stability, BNDINTR is the bond yield, BONDVALUE is the bond price, M3/GDP is financial deepening, INTR is interest rate, and INFL is inflation. Also, α_i is the individual specific effect, $GDPPCGRWTH_t$ is the time specific effect, t represents time, while ε_t represents the white noise error term.

Table 1: Definition of the Variables of the Model

S/N	Acronym	Description	Variable Type	Source	Apriori Expectation
1	GDPPCGRWTH	Real Gross Domestic Product	Dependent Variable	Aluko and Ibrahim (2020), Ragmoun (2023), Mehmood et al. (2022), Utile et al. (2021)	Nil
2	IQI	Institutional Quality Index	Explanatory Variable	Yushi and Borojo (2018), Ragmoun (2023), Mehmood et al. (2022), Utile et al. (2021), Abubakar (2020),	Positive
3	PSTAB	Political stability	Explanatory Variable	Khan et al. (2022), Handoyo (2023) Kaufmann and Kraay (2023), Sabir et al. (2019)	Positive
4	RQUAL	Regulatory Quality	Explanatory Variable	Khan et al. (2022), Handoyo (2023) Kaufmann and Kraay (2023), Dau (2013), Dau et al. (2022), Sabir et al. (2019)	Positive
5	COCORRUP	Control of Corruption	Explanatory Variable	Khan et al. (2022), Handoyo (2023) Kaufmann and Kraay (2023), Mehmood et al. (2022)	Positive
6	GEFFVNS	Government Effectiveness	Explanatory Variable	Sabir et al. (2019)	Positive
7	BNDINTR	Bond Yield	Explanatory and Explained Variable	Oke et al. (2021), Hartley and Rebucci (2020)	Positive
8	BONDVALUE	Bond Price	Explained Variable	Ngaruiya and Njuguna (2016)	Positive
9	INFR	Inflation	Control Variable	Pradhan, Arvin, Norman and Bahmani (2018)	Negative
10	RINTR	Interest Rate	Control Variable	Piljak and Swinkels (2017)	Positive
11	M3/GDP	Financial Deepening	Control Variable	Ani, Ugwunta, and Okanya (2013)	Positive

Source: Authors' Compilation (2025)

The panel data is a dataset in which the behaviour of entities is observed across time. Panel data allows for the control of unobservable or immeasurable variables that change over time and across countries. This accounts for individual heterogeneity. Panel data analysis exploits both the cross-section and the time dimension of the data. Instead of estimating each group in isolation, it is carried out simultaneously, and takes into consideration the heterogeneity, which comes from belonging to a specific group. In this study, the choice between fixed effects (FE) and random effects (RE) will be determined using a likelihood test – the Hausman test.

The researcher deepened the investigations by employing panel dynamic fully modified ordinary least squares (FMOLS) and panel dynamic ordinary least squares (DOLS) models as a robustness check for the study findings even though was not necessary. The FMOLS technique provides optimal estimates of co-integration consistent with the parameters, even when the sample size is small, and overcomes the problems of endogeneity, serial correlation, omitted variable bias and measurement errors. It also allows for heterogeneity in the long-run parameters. The long-run correlation between the cointegrating equation and stochastic regressors.

The resulting Fully Modified OLS (FMOLS) estimator is asymptotically unbiased and has fully efficient, allowing for standard Wald tests using asymptotic Chi-square statistical inference. The FMOLS estimator employs long-run covariance matrices of the residuals. It may be estimated directly from the difference regressions. On the other hand, the dynamic OLS method augments the co-integrating regression with lags and leads, such that the resulting co-integrating equation error term is orthogonal to the entire history of the stochastic regressor innovations. The DOLS model assumes that the introduction of lags and leads of the differenced regressors takes care of all the long-run correlation between the error terms, which makes the model have the same asymptotic distribution (Kurozumi & Hayakawa, 2009) as those obtained from FMOLS. Masih & Masih (1996) also argue that DOLS does not impose additional requirements that all variables should be integrated of the same order $[I(1)]$ and that the regressors themselves should be co-integrated. The advantage of this technique is that, in the event of an error in stationarity determination, the DOLS model makes up for the shortcomings. The FMOLS and DOLS are specified as follows:

$$\beta^{*NT} - \beta^{FMOLS} = \left[\sum_{i=1}^N L_{22t}^{-1} \sum_{t=1}^T (x_{it} - x_{it}^*)^2 \right] \sum_{t=1}^N L_{11t}^{-1} L_{22t}^{-1} \left[\left(\sum_{t=1}^T (x_{it} - x_t) \mu_{it}^* - T_{y1}^{\wedge} \right) \right] - -$$

- (4)

Note, the Dynamic OLS estimator had the same asymptotic distribution as that of the panel FMOLS estimation derived by Pedroni (1996). Both the DOLS and FMOLS estimations were performed as shown to confirm the consistency of the outcome. However, following Stock & Watson (1993), we specified the DOLS model below.

$$Y_t = \alpha + bX_t + \sum_{i=-k}^{i=k} \varphi_i \Delta X_{t+i} + \varepsilon_t \text{-----}(5)$$

This model assumes that adding the lags and leads of the differenced regressors soaks up all of the residuals' long-run correlation covariance matrices and that the least-squares estimates have the same asymptotic distribution as those obtained from FMOLS.

4. RESULTS

First, the basic descriptive statistics of the dataset are presented in table 2.

Table 2: Summary of Basic Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
COCORRUP	-0.64	-0.75	1.70	-1.97	0.66	0.72	3.09	102.26
BNDINTR	1.44	0.00	21.50	-14.22	6.03	0.52	4.78	23.25
BONDVALUE	12394259	0.00	6.10E+09	-1.44E+09	2.05E+08	19.07	497.83	18278098
GDPPCGRWTH	1.09	1.29	140.49	-48.43	7.16	4.18	85.70	654978.0
M3GDP	73.98	21.23	19402.83	0.01	880.08	19.08	371.56	11870297
PSTAB	-0.58	-0.41	1.28	-3.31	0.94	-0.37	2.51	38.93
RQUAL	-0.73	-0.73	1.20	-2.55	0.65	0.06	3.34	6.56
RINTR	5.09	6.00	61.90	-93.51	14.30	-1.92	13.02	5486.81
INFR	36.87	7.21	23773.13	-17.64	582.04	37.66	1519.47	1.75E+08
GEFFVNS	-0.80	-0.84	1.15	-2.44	0.65	0.42	3.22	37.60

Source: Authors' Computation

The measurements of dispersion and central tendency are shown with bond value accounting for the highest average while government effectiveness represents the least of the values. Expectedly, the most highly dispersed series is inflation which speaks to the instability in the price level in SSA countries. This goes to support the fact that SSA countries account for a very high inflation level which is one of the factors affecting the growth and stability of the region. The normality indicators shown by skewness, kurtosis and the Jarque Bera statistics shows that the series act in consistency with the behaviour of financial and econometric time series which depart from normality.

Next, the linear association of the panel series is the result of the correlational matrix shown in table 3.

Table 3: Correlational Matrix

	COCORRUP	BNDINTR	BONDVALUE	GDPPCGRWTH	M3GDP	PSTAB	RQUAL	RINTR	INFR	GEFFVNS
COCORRUP	1	0.98	0.48	0.66	0.99	1.00	0.98	-0.81	-0.84	0.99
BNDINTR	0.98	1	0.64	0.50	0.95	0.97	1.00	-0.68	-0.75	1.00
BONDVALUE	0.48	0.64	1	-0.33	0.40	0.46	0.65	0.11	-0.06	0.60
GDPPCGRWTH	0.66	0.50	-0.33	1	0.73	0.67	0.50	-0.96	-0.82	0.55
M3GDP	0.99	0.95	0.40	0.73	1	0.98	0.95	-0.84	-0.82	0.96
PSTAB	1.00	0.97	0.46	0.67	0.98	1	0.97	-0.83	-0.87	0.99
RQUAL	0.98	1.00	0.65	0.50	0.95	0.97	1	-0.68	-0.74	1.00
RINTR	-0.81	-0.68	0.11	-0.96	-0.84	-0.83	-0.68	1	0.95	-0.73
INFR	-0.84	-0.75	-0.06	-0.82	-0.82	-0.87	-0.74	0.95	1	-0.78
GEFFVNS	0.99	1.00	0.60	0.55	0.96	0.99	1.00	-0.73	-0.78	1

Source: Authors' Computation (2025)

The bivariate correlational analyses reported above show varied degrees and direction of linear association. Given attention to the dependent variable versus the other variables, all the governance indicators share a positive comovement with economic growth while inflation, real interest rate and bond value all move in opposite direction with economic growth. The figure one or 100% as indicated in the transverse part of the table shows the correlation of the variables to themselves. The correlation matrix also rules out the likelihood of multicollinearity as the series do not have high correlation coefficient.

In choosing the appropriate panel unit root test with recourse to cross sectional attributes of the series, a cross-sectional dependence test of the form reported in table below was conducted.

Table 4: Cross Sectional Dependence Test

Variable	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
BNDINTR	1104.303	-0.498917	-0.905697	2.545356
BONDVALUE	1051.207	-1.616778	-2.023557	1.420454
GDPPCGRWTH	1115.759	-0.257724	-0.664503	-0.078315
GEFFVNS	1108.484	-0.410896	-0.817675	2.437873
INFR	1115.037	-0.272915	-0.679695	-1.163270
M3GDP	1152.129	0.508006	0.101226	1.781489
PSTAB	1111.710	-0.342964	-0.749743	2.011584
RINTR	1142.278	0.300602	-0.106178	0.113465
RQUAL	1106.238	-0.458176	-0.458176	2.559368

Source: Authors' Computation 2025.

The results show that the series are largely cross-sectionally independent, though pockets of departure were observed. To account for this mixed outcome (though very slight), the unit root test used a combination of tests that assume common unit root processes and those that assume individual unit root processes. This ensures the robustness of the outcome and the validity of inferences on the stationarity properties of the panel series. To show the stationarity properties of the panel series, the panel unit root test of the form reported in table 5 is shown.

Table 5: Summary of Panel Unit Root Test

	IPS	ADF	PP	INF
BNDINTR	-1.83(0.0336)	24.43(0.0065)	41.99(0.0000)	I (0)
BONDVALUE	-18.94(0.0000)	393.62(0.0000)	628.61(0.0000)	I (0)
COCORRUP	-4.21(0.0000)	190.06(0.0000)	298.98(0.0000)	I (0)
GDPPCGRWTH	-28.45(0.0000)	1004.10(0.0000)	1261.73(0.0000)	I (0)
GEFFVNS	-4.05(0.0000)	159.07(0.0001)	194.48(0.0000)	I (0)
INFR	-18.13(0.0000)	509.68(0.0000)	528.62(0.0000)	I (0)
M3GDP	-37.70(0.0000)	1177.08(0.0000)	1801.64(0.0000)	I (1)
PSTAB	-6.18(0.0000)	188.66(0.0000)	202.12(0.0000)	I (0)
RINTR	-13.54(0.0000)	359.55(0.0000)	416.87(0.0000)	I (0)
RQUAL	-5.78(0.0000)	193.83(0.0000)	231.56(0.0000)	I (0)

Source: Authors' Computation (2025)

All the reported tests assume cross-sectional independence. A combination of the Im Pesaran and Shin, Augmented Dickey Fueller panel unit root test and Philip Peron Fisher tests agree that the series are all integrated of order zero I (0). This implies that the variables need no differencing to attain stationarity. This provides justification for the use of the traditional panel least squares form of fixed effect and random effect. The results of the panel regression estimate for the two formulated and tested models are shown in table 6 below:

Table 6: Summary of Basic Panel Regression Results

Variables	Fixed Effects			Hausmann	Random Effect		
Model 1							
	Coeff	T-stat	p-Value	2.5156	Coeff	T-stat	p-Value
C	10.71	95.73**	0	-0.473	10.72	92.45**	0
LBONDVALUE	-0.47	-86.35**	0		-0.47	-82.36**	0
BNDINTR	-0.002	-2.67**	0.0093		-0.002	-1.6	0.1131
M3GDP	#####	-0.78	0.4368		-1E-04	1.08	0.2846
Model 2							
C	2.58	10.98**	0	11.412748 (0.0438)	2.5709	7.3103	0
COCORRUP	0.44	0.96	0.336		0.4058	0.8905	0.3734
GEFFVNS	2.44	3.74**	0.0002		2.4266	3.7203	0.0002
PSTAB	-0.41	12.94**	0		-0.385	-1.665	0.0963
RQUAL	-1.48	-2.47*	0.0137		-1.462	-2.445	0.0146
INFR	-0.02	-3.39**	0.0007		-0.017	-3.626	0.0003

Source: Authors' Computation (2025)

The results of the first two models estimated to test the first seven hypotheses are shown. Fixed effect and random effects form of panel regression were used with Hausmann test acting as the guide to select the more efficient of the two models. While model one tested the responsiveness of economic growth to bond market variables, model two is for the impact of governance indicators on economic growth.

The Hausmann test results show that the efficient estimation technique for model 1 is the random effect estimator. The most efficient estimator for model 2 is the fixed effect model. The null hypothesis in favour of random effect cannot be rejected in model 1 while it is summarily rejected in model 2. Prior to the use of the estimated model for the relevant inferences, a couple of diagnostic tests of the form shown in table 7 were used to confirm the validity and the reliability of the results.

Table 7: Summary of Diagnostic tests

Model	R-Squared	Info-Criterion (AIC)	DW Stat	F-Stat	Log likelihood Ratio
Model 1(Bond Related Variables)	98.9%	-3.758	2.13	2644(0.00)	172.59
Model 2 (Institutional Quality Indicators)	75.3%	5.892	1.53	6.387(0.000)	-2.876.79
Panel B - Residual-B Cross Sectional Dependence Test					

Model 1	Statistic	Prob.
Breusch-Pagan LM	8.977639	0.5342
Pesaran scaled LM	-0.228607	0.8192
Bias-corrected scaled LM	-0.270980	0.7864
Pesaran CD	-0.918740	0.3582
Model 2	Statistic	Prob.
Breusch-Pagan LM	10.57023	0.3920
Pesaran scaled LM	0.127508	0.8985
Pesaran CD	-0.018792	0.9850
Panel C - Q-Statistics for Higher Order Autocorrelation		

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
. .	. .	1	0.015	0.015	0.0235	0.878
. *	. *	2	0.098	0.097	1.0629	0.588
. *	. *	3	0.116	0.114	2.5367	0.469
. *	. *	4	0.145	0.137	4.8853	0.299

Source: Authors' Computation (2025)

The high R-squared values for both models indicate strong explanatory power and goodness of fit. The information criteria show that the bond-related model is more optimal than the institutional quality model, as reflected in its higher log-likelihood and lower AIC, while other criteria (Schwarz, Hannan-Quinn) are presented in the Appendix. The statistically significant F-statistics confirm the robustness of the models. Autocorrelation and cross-sectional dependence were ruled out, as the DW-statistics fall around two and the null of residual independence was not rejected.

Given the DW-stat's limitation in testing higher-order autocorrelation, the Ljung-Box Q-statistics was applied, confirming no higher-order autocorrelation in the panel model. Thus, the panel estimates are valid and reliable. Results further show that bond value negatively and significantly affects economic growth, while bond interest rates exert no significant influence. In contrast, governance indicators largely display significant positive effects on economic growth in Sub-Saharan African countries during the study period.

The FMOLS results as presented in table below were used to tests the formulated hypotheses.

Table 8: Summary of Fmols Results

MODEL ONE				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RINTR	-0.099752	1.240370	-0.080421	0.9360
INFR	-0.180987	0.046969	-3.853347	0.0002
M3GDP	-0.011002	0.033412	-0.329273	0.7423
BONDVALUE	0.050010	0.010309	4.851100	0.0012
BNDINTR	-0.135515	0.836106	-0.162079	0.8714
R-squared	0.202730	Mean dependent var		2.715100
Adjusted R-squared	0.163944	S.D. dependent var		3.615089
S.E. of regression	3.305495	Sum squared resid		2021.366
Long-run variance	9.653593			

MODEL TWO				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PSTAB	-1.668292	0.257015	-6.491029	0.0053
RINTR	0.132309	0.912701	0.035399	0.9719
RQUAL	-0.349663	0.028920	-12.090698	0.0000
GEFFVNS	0.821247	0.118257	6.944595	0.0002
INFR	-0.159157	0.049087	-3.242331	0.0018
COCORRUP	5.745030	1.910590	3.006940	0.0036
M3GDP	0.095439	0.053945	1.769174	0.0812
R-squared	0.359912	Mean dependent var		2.730250
Adjusted R-squared	0.260743	S.D. dependent var		3.248786
S.E. of regression	2.793308	Sum squared resid		553.9823
Long-run variance	4.401469			

Source: Authors' Computation (2025)

The superiority of the FMOLS estimators over the basic panel guided its choice as the basis for the test of the formulated hypotheses in the subsequent sections.

The result shows that a unit change in government effectiveness (GEFFVNS) causes a 0.82-unit change in economic growth. This change is found to be significant as the p-value of 0.0002 is less than the 0.05 level of significance. The result shows that as the effectiveness of government rises, the economy grows implying that economic growth is a positive and significant function of the effectiveness of government.

Given that government effectiveness is found to positively and significantly affect the growth of the economies, economic growth is a positive and significant function of government effectiveness within the investigated period and geography.

The result shows that a unit change in control of corruption (COCORRUP) causes a 5.75-unit change in economic growth. This change is found to be significant as the p-value of 0.0036 is less than the 0.05 level of significance. The result shows that as the control of corruption rises, the economy grows implying that economic growth is a positive and significant function of control of corruption. This further means that control of corruption exerts increasing influence on the growth of the economies of the SSA countries studied.

The result shows that a unit change in regulatory quality (RQUAL) causes a -0.35-unit change in economic growth. This change is found to be both negative and significant given the negative coefficient and the p-value of 0.0000 that is less than the 0.05 level of significance. The result shows that as regulatory quality rises, the economy shrinks implying that economic growth is a negative and significant function of regulation. This further means that in most SSA countries overregulation may have hampered economic growth. This means that it is possible that regulation may have been made in a manner that became inhibitive to economic independence of economic agents thereby making it a limiting factor to growth.

The result shows that a unit change in political stability (PSTAB) causes a 1.67-unit change in economic growth. This change is found to be both negative and significant given the negative coefficient and the p-value of 0.0053 that is less than the 0.05 level of

significance. The result shows that as political environment stabilizes, the economy grows shrinks implying that economic growth is a negative and significant function of political stability. This means that the stability of the political environment can inhibit the growth of the economies of SSA countries.

The result shows that a unit change in bond value causes a 0.05-unit change in economic growth. This change is found to be both positive and significant given the positive coefficient and the p-value of 0.0012 that is less than the 0.05 level of significance. The result shows that as bond value rises, the economy grows showing that economic growth is a positive and significant function of bond value.

Bond yield is proxied by bond interest and the result shows that a unit change in bond yield causes a 0.14-unit change in economic growth. This change is found to be both negative and non-significant given the negative coefficient and the p-value of 0.8714 that is greater than the 0.05 level of significance. The result shows that as bond yield rises, the economy shrinks marginally showing that economic growth is a negative and significant function of bond yield.

The relative result for the test of this hypothesis is presented in table 4.11 below:

Table 9: Panel Fully Modified Least Squares (FMOLS)- Relative Results for Test of Hypothesis Seven

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQBM	0.0922	0.037	2.4919	0.0143
INFR	0.1324	0.0239	5.537	0
RINTR	0.0764	0.0357	2.1421	0.0347

Source: Author's Computation (2025)

The interactive effect of institutional quality and bond market indicated by IQBM shows that a unit change in the interactive variable causes a 0.09-unit change in economic growth. This change is found to be both positive and significant given the positive coefficient and the p-value of 0.0143 that is less than the 0.05 level of significance. The result shows that as interaction between institutional quality and bond markets improves, the economy grows showing that economic growth is a positive and significant function of the interactive between institutional quality and bond market performance.

The results show that government effectiveness (GEFFVNS) positively and significantly influences economic growth, with a coefficient of 0.82 and a p-value of 0.0002. This implies that stronger governance enhances growth in SSA, consistent with institutional theory and the findings of Sabir et al. (2019), though contrary to Afolabi (2019). Similarly, control of corruption (COCORRUP) exerts a strong positive and significant effect, with a coefficient of 5.75 and p-value of 0.0036, supporting the view that reducing corruption fosters growth. This aligns with Grundler and Potrafke (2019) but contradicts Pluskota (2020).

Regulatory quality (RQUAL), however, has a negative and significant effect on growth, with a coefficient of -0.35 ($p = 0.0007$). This suggests that overregulation in SSA may

constrain economic activity, limiting the independence of economic agents. Political stability (PSTAB) also shows a negative and significant effect, with a coefficient of -1.67 ($p = 0.0053$), indicating that stability in the region does not necessarily translate into growth. This finding diverges from institutional theory but aligns with Iheonu et al. (2017) and Glawe and Wagner (2019).

Regarding bond market indicators, bond value has a positive and significant effect (0.05 ; $p = 0.0012$), implying that rising bond market capitalization supports growth. This aligns with Nneka et al. (2022) and Oke et al. (2021) but contrasts with traditional theory, which links higher bond yields to reduced investment. Bond yield, proxied by bond interest, shows a negative but insignificant effect (-0.14 ; $p = 0.8714$), suggesting limited influence on growth. This outcome is consistent with Chidi-Okeke et al. (2019) but contradicts Wahidin et al. (2021). The interaction between institutional quality and bond markets (IQBM) yields a positive and significant coefficient of 0.09 ($p = 0.0143$), confirming that stronger institutions combined with deeper bond markets enhance growth. This supports institutional theory and aligns with Warsame et al. (2023) and Mehmood et al. (2022), emphasizing the importance of governance in strengthening financial systems and fostering development in SSA.

5. CONCLUSION AND RECOMMENDATIONS

The findings show that government effectiveness significantly enhances economic growth, highlighting the role of strong governance in promoting performance. Political stability and bond value also exert significant positive effects, suggesting that stable political environments and deep bond markets foster sustainable growth. Control of corruption, though positively related to growth, is statistically insignificant, indicating that anti-corruption efforts alone may not substantially drive development. Conversely, regulatory quality demonstrates a significant negative effect, implying that excessive or poorly designed regulations constrain expansion. Bond yield negatively affects growth but remains statistically insignificant, reflecting the deterrent effect of high yields on investment. Importantly, the interaction between institutional quality and bond market development is both positive and significant, showing that strong institutions enhance the growth impact of bond markets. Overall, the study affirms the central role of effective governance, political stability, and financial market development in Sub-Saharan Africa's economic progress.

Policy recommendations emphasize strengthening institutions and financial markets. Governments should streamline bureaucracy, empower anti-corruption agencies with operational independence, and ensure effective enforcement by oversight institutions. Regulatory frameworks must be designed through inclusive consultations with business and investor groups to balance public interest with growth needs. Political stability can be advanced through stronger security measures, national peace commissions, and conflict resolution mechanisms. Attracting investment into bond markets requires transparent issuance processes, improved credit ratings, and greater institutional investor participation. Authorities must also monitor yield curves and intervene to prevent

destabilizing fluctuations through tools like open market operations and bond buybacks. Legal reforms that safeguard property rights and enhance market confidence remain essential for long-term stability.

This study enriches the literature by integrating a multidimensional construct of institutional quality comprising government effectiveness, corruption control, regulatory quality, and political stability with bond market indicators such as bond yield and value to assess their joint impact on economic growth. The use of a composite institutional quality index (IQI) improved clarity and analytical rigor. Extending coverage to 2023 with robust panel data from 1998–2023, the study applied panel regression and reinforced findings using FM-OLS and DOLS techniques. Future research could incorporate additional proxies of institutional quality and bond market performance, explore their influence on human capital development, or extend similar analyses to other developing regions with updated panel datasets.

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