УДК 330.35:330.322 (6)
DOI 10.14258/epb202621

FINANCIAL DEVELOPMENT, INSTITUTIONAL QUALITY, AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICAC

Rahji Ohize Ibrahim

AL-Hikmah University (Ilorin, Nigeria)

The paper analyzes the dynamic relationships among financial development, institutional quality and economic growth of 35 Sub-Saharan African (SSA) countries during the year 2008–2023. Despite the extensive literature that has discussed the finance-growth nexus, its application in the context of heterogeneous institutions is debatable, especially in emerging and structurally limited economies like SSA. This article goes beyond the traditional linear finance-growth argument by including institutional variables and effects of interaction to indicate whether financial development on its own stimulates growth or it is effective based on the quality of governance. The panel data methods, namely, the Fixed Effects and the Random Effects models, are used to assess the direct and moderating impacts of the major financial variables, such as domestic credit to the private sector and bank liquidity reserves, and the institutional factors, such as the rule of law and control of corruption, on the growth in the GDP per capita.

The empirical evidence demonstrates that there is a multidimensional and complicated relationship. However, unlike the conventional belief, domestic credit to the non-government sector and bank liquidity resource portrays strong negative correlations to economic growth. This implies that financial deepening is not necessarily associated with productive investment in SSA, which may be because of ineffective intermediation, inefficient distribution of credit, structural inflexibilities, or governance failures in financial systems. Banks holding excessive liquidity can also reduce the ability of banks to transmit credit to productive sectors, which will reduce the growth outcomes. The negative relationship between inflation and growth is also worthy of reinforcing the fact that macroeconomic stability is supporting capital accumulation and investment planning.

Institutional quality instead, especially the rule of law, is found as a very powerful and statistically significant positive determinant of economic growth. The present observation highlights to the protection of good law systems, enforcement of contracts and protection of property rights as being of paramount importance to investor confidence and lowering the transaction costs. Although control of corruption fails to show a direct effect of growth, its relationship with domestic credit is positive and significant. This relationship establishes the existence of institutional moderation, which means that only in case of better governance, the growth enhancing potential of financial development is realized. In particular, the complementarity between financial and institutional reforms is seen in that in cases where there is enough control over corruption, private sector credit is a positive contributing factor to growth.

These results contradict the belief that financial liberalization is only enough to cause sustainable economic growth in SSA. Rather, as the findings indicate the two factors, financial development and institutional quality are mutually reinforcing elements of a wider development model. Expansive credit policies that do not enhance the legal and regulatory institutions stand a chance of inefficiency and poor growth results. The research conclusively points out that institutional capacity building, especially reinforcement of the rule of law and curbing corruption is not just complementary, but a precondition of financial development to result in growing development dividends that are meaningful and sustainable in Sub-Saharan Africa.

Keywords: Financial Development, Institutional Quality, Economic Growth, Governance, Sub-Saharan Africa.

ФИНАНСОВОЕ РАЗВИТИЕ, КАЧЕСТВО ИНСТИТУТОВ И ЭКОНОМИЧЕСКИЙ РОСТ В СТРАНАХ АФРИКИ К ЮГУ ОТ САХАРЫ

Рахджи Охизе Ибрагим

Университет Аль-Хикма (Илорин, Нигерия)

В статье анализируются динамические взаимосвязи между финансовым развитием, качеством институтов и экономическим ростом 35 стран Африки к югу от Сахары (SSA) в период 2008–2023 годов. Несмотря на обширную литературу, посвященную взаимосвязи финансов и роста, ее применение в контексте неоднородных институтов является спорным, особенно в развивающихся и структурно ограниченных экономиках, таких как страны SSA. Данная статья выходит за рамки традиционного линейного аргумента «финансы-рост», включая институциональные переменные и эффекты взаимодействия, чтобы показать, стимулирует ли финансовое развитие само по себе рост или же его эффективность зависит от качества управления. Для оценки прямого и опосредующего влияния основных финансовых переменных, таких как внутреннее кредитование частного сектора и банковские резервы ликвидности, а также институциональных факторов, таких как верховенство права и борьба с коррупцией, на рост валового внутреннего продукта (ВВП) на душу населения используются методы панельных данных, а именно модели фиксированных эффектов и случайных эффектов.

Эмпирические данные показывают, что существует многомерная и сложная взаимосвязь. Однако, в отличие от общепринятого мнения, внутреннее кредитование негосударственного сектора и ликвидность банков демонстрируют сильную отрицательную корреляцию с экономическим ростом. Это означает, что углубление финансовой системы не обязательно связано с производительными инвестициями в странах Африки к югу от Сахары, что может быть обусловлено неэффективным посредничеством, неэффективным распределением кредитов, структурной негибкостью или сбоями в управлении финансовыми системами. Банки, обладающие избыточной ликвидностью, также могут снижать свою способность передавать кредиты производственным секторам, что уменьшает показатели роста. Отрицательная взаимосвязь между инфляцией и ростом также подтверждает тот факт, что макроэкономическая стабильность поддерживает накопление капитала и планирование инвестиций.

Напротив, качество институтов, особенно верховенство права, является очень мощным и статистически значимым положительным фактором экономического роста. Настоящее исследование подчеркивает первостепенную важность защиты добросовестных правовых систем, обеспечения исполнения контрактов и защиты прав собственности для доверия инвесторов и снижения транзакционных издержек. Хотя борьба с коррупцией не демонстрирует прямого влияния на рост, ее связь с внутренним кредитованием является положительной и значимой. Такая взаимосвязь подтверждает существование институциональной умеренности, это означает, что потенциал финансового развития, способствующий росту, реализуется только при более эффективном управлении. В частности, взаимодополняемость финансовых и институциональных реформ проявляется в том, что в случаях, когда контроль над коррупцией достаточно эффективен, кредитование частного сектора является положительным фактором роста.

Эти результаты противоречат убеждению, что финансовой либерализации достаточно лишь для обеспечения устойчивого экономического роста в странах Африки к югу от Сахары. Напротив, как показывают результаты исследования, два фактора — финансовое развитие и качество институтов — являются взаимоусиливающими элементами более широкой модели развития. Экспансивная кредитная политика, не укрепляющая правовые и регулирующие институты, рискует привести к неэффективности и низким результатам роста. Исследование убедительно показывает, что наращивание институционального потенциала, особенно укрепление верховенства права и борьба с коррупцией, являются не просто взаимодополняющими, но и необходимым условием финансового развития для получения значимых и устойчивых дивидендов в странах Африки к югу от Сахары.

Ключевые слова: финансовое развитие, качество институтов, экономический рост, управление, страны Африки к югу от Сахары.

Introduction. Sustainable economic growth has remained the paramount goal for Sub-Saharan Africa (SSA) policymakers since the post-colonial period [1]. In spite of the abundant natural and human capital in SSA, the region's development trajectory has been typified by spells of slow growth, pervasive poverty, and uneven development [2]. As a reaction to this fact, numerous strategies, including state-run models and market-oriented policies, have been implemented during the decades, with increasing focus on the financial sector as the growth driver [3]. Through the mobilization of savings, reallocation of productive investment, facilitating payments, and risk diversification, financial intermediaries are intended to improve efficiency, accelerate capital accumulation, and improve economic growth [4].

Consequently, the majority of SSA countries launched ambitious financial liberalization policies, especially since the 1980s [5]. They involved deregulation of interest rates, privatization of state-owned bank, and domestic market opening to foreign competition expecting that a more deep and sophisticated financial system would provide higher and more balanced growth [6]. The experiences have been decidedly mixed. While some countries did experience a degree of financial deepening, the expected effect on longer-run economic growth, especially for developing countries, has not been realized [7]. The below-average outcomes have triggered a strong re-testing of the finance-growth nexus, with the conclusion that domestic financial development is not an end in itself and some other conditioning factors need to be accounted for.

Over the past decades, there has been an acute «institutional turn» in the growth literature advocating institutions as of key importance as determinants of final causes of long-term growth [4, 8]. This perspective believes that institutions or the «rules of the game», particularly property rights security, rule of law, regulation quality, control of corruption, create economic incentives, and these will either enhance or constrain the success of market reforms [9]. Strong institutions maintain low transaction costs, reduce uncertainty, and enable investment and innovation. An advanced banking system within the framework of inadequate institutions can become crony capitalism, misallocating resources and causing system instability to impede sustainable growth [10].

The guiding question that motivated this study was that the contributions of finance and institutions to growth have been treated separately but infrequently have they been examined together in the context of Sub-Saharan Africa. The interaction between financial development and institutional quality is weak or mixed empirically. There is space for the Sub-Saharan African context in which some threshold of institutional quality must be achieved before financial development begins to make any positive and significant contribution to growth.

Thus, the present paper will address the relevant main research question: What is the shape of the relationship between financial development, institutional quality, and economic growth in Sub-Saharan Africa? That is, does institutional quality moderate the effect of financial development on economic growth? The main aim of this study is to investigate this relationship empirically with panel data for a sample of Sub-Saharan African countries.

***Theories of Economic Growth*.** The quest for determinants of long-run economic growth has given rise to several influential lines of thought. The neoclassical growth model, as presented by Solow [11], provides the basis for much of the contemporary analysis employed in the study of growth. The most important result of the Solow model was the prediction of conditional convergence: countries that start with less physical capital per worker will grow faster than the rich country until they reach a similar «steady-state» level of per capita income. One of the primary issues with this model, and thus limitation to examine the role of policy, is that it exogenously supposes productivity to be rising. It is understood that technology may improve over time, and this would create long-run rises in living standards, but the Solow model does not describe the economic forces which create technological improvements. The failures of the neoclassical model spawned Endogenous Growth Theory in the late 1980»s in the work of Romer [12] and Lucas [13]. Endogenous Growth Theory provides a theoretical channel through which the financial sector, through the quality of institutions, can impact the growth rate.

Theories of Financial Development. Although endogenous growth models supply a channel through which finance can affect growth, the intuition behind their reasoning predated endogenous growth models. The first, and possibly most compelling, arguments along these lines were made by Joseph Schumpeter in 1911. Schumpeter believed the most important role of financial intermediaries is to search for and finance productive investments and innovative entrepreneurs. As a vehicle for capital accumulation, the financial system stimulates productivity and acts as an agent for growth. The Schumpeterian approach evolved forcefully in the 1970s with McKinnon [14] and Shaw [15]

Specifically, the McKinnon-Shaw hypothesis is that, if the financial system were liberalized so that market forces determined interest rates, the volume and quality of saving and investment would increase. Intuitively, recent efforts in the theoretical literature use a functional approach to explain the relationship between finance and growth. More specifically Ross Levine in 1997, have argued that the specific financial

institution or instruments are less important than their role for the economy. Further, their main argument is that the more effectively a financial system performs, the better the capital allocation and risk management will be at contributing to capital accumulation and technological progress leading to increased economic growth. The functional approach provides an overall framework to understand exactly how financial development helps the real economy.

New Institutional Economics. Financial systems matter, but their ability to support growth does not come separately or in a disconnected manner. The New Institutional Economics (NIE) approach is a powerful method for describing the determinants beneath the surface, as well as the root characteristics of economic performance. North's [16] work advanced new institutional economics from a capital and technology focus. North [16] argues that the most important factor in sustained economic advancement is not technology and capital, but the «rules of the game» in society (i. e. the institutions). North [16, p. 3] states that institutions are «humanly devised constraints that shape human interaction». Thus, new institutional economics postulates that, while high-quality institutional environment would be advantageous; it is a precondition for both financial markets as well as for properly functioning markets, and long-term sustainable economic growth

Relationship Between Financial Development and Economic Growth. The predominant empirical outcome reported is that a well-functioning financial system is a key driver growth in many economies, including in developing countries. The consensus is that an efficient financial sector can induce economic growth. In Sub-Saharan Africa (SSA), Aluko and Ibrahim [6], and Masila et al. [5] present all the proof that financial deepening enhances the economic growth in Sub-Saharan Africa. Generally, these studies confirm finance enhances growth through mobilization of savings, investment facilitation, and effective channeling of capital.

However, it was also argued that the intersection between financial development and positive impacts is not universal and is subject to the externality of the institutional environment. Specifically, in regions that are weak institutions characterizing corruption, political instability, and poor rule of law, it can severely undermine the potential of the financial sector to support growth. Asante et al. [18] and Kassie [17] investigated whether or not institutional quality matters for the finance-growth nexus in SSA, its conclusion is that, it does. Quite notably, Mbulawa and Chingoiro [19] and Mbuyi and Mulumba [20] both point out that financial sector growth will have even better effects when associated with good institutions. It becomes even more complicated as Adu-Darko [9] demonstrates that relationships are not straightforward, where the impacts of finance on growth change for the better and sometimes worse, as institutions improve in quality.

Appiah et al. [21] for ECOWAS countries and Bandura and Dzingirai [22] for the broader SSA region reinforces the view that institutions are a critical channel through which financial development influences economic outcomes. Despite the crucial moderating role of institutions, the underlying expectation based on the bulk of empirical work is that financial development remains a positive and significant driver of growth. Therefore, the first hypothesis is proposed as follows:

Hypothesis 1: Financial development does not have statistically significant effect on economic growth in Sub-Saharan Africa.

Relationship Between Institutional Quality and Economic Growth. The new institutional economics perspective, whereby «rules of the game» are a major driver of economic performance, is amply confirmed by Sub-Saharan Africa's evidence. Empirical research consistently shows that those nations with more solid institutions, ruled by the rule of law, control of corruption quality, and effective governance, have greater and more sustainable rates of economic growth. Hussen [1] and Wandeda et al. [3] using panel data approaches, both argue that institutions» quality is a strong and positive determinant of economic growth for Sub-Saharan Africa. Similarly, Abdulwahab [23] and Afolabi and Raifu [8] depict how good institutions, with human capital being often present, are instrumental in establishing economic growth and resilience. These researches highlight that a stable legal framework, low levels of corruption, and an effective public sector create an environment that is conducive to investment, innovation, and overall productivity. In addition, institutional quality growth impacts extend beyond the GDP impacts to include overall development outcomes. It is discovered by Afolabi and Oyeleke [24] that institutional quality and inclusive growth are positively related, while Suhaibu et al. [7] confirm that institutional enhancement has an impact on the overall living standards of a country. These studies demonstrate that poorly developed institutions form a powerful hindrance to development in this region. Therefore, the second hypothesis is formulated as:

Hypothesis 2: Institutional quality does not have statistically significant effect on economic growth in Sub-Saharan Africa.

The Interactive Effect of Financial Development and Institutional Quality on Growth. Although earlier research demonstrated the individual direct impacts of financial development and institutional quality on growth, another channel of research is to examine their interactive as well as complementary dimensions. The main hypothesis is that the impacts of financial development on growth are not fixed because the country's institutional quality has a role in moderating

the relationship. A financial system can be as deep, either the money market or the capital market, if a poor rule of law, pervasive corruption and political instability prevail [24]. Quality institutions help to avoid financial contracts being enforceable, property rights transferable and secured, and credit going in the right direction, that is, to get the impact of financial deepening [20].

There is direct empirical proof for this interaction as in the studies of Berhane [25], Mbuyi and Mulumba [20] and Mbulawa and Chingoiro [19] who investigated the moderating effect of institutions and find that the growth promoting effects of financial development are much larger in countries with more effective institutions. In the same way, Egbetunde and Akinlo [10] illustrated that the benefits of financial globalization, as a component of financial development, are dependent on the solidity of domestic institutions to counter some of the hazards and show where the capital will be used productively. The findings of their report point out that there must be some institutional development prior to the full benefit of finance being attained.

This view is backed by literature that investigates this interactive relationship against the background of broader development goals. Specifically, Gyamfi et al. [26] discovered the joint effect of financial development and institutional quality to be significant in achieving inclusive growth in Africa. Olaniyi and Odhiambo [27] also found the quality of institutions to have a significant moderating role in the relationship between financial development and economic complexity, with the implication being that good governance enables finance to bring about an economy that is more complex and robust. The role of this advanced body of literature is the consensus that financial development and institutional quality are complements in the process of growth. Therefore, the final hypothesis is proposed to test this crucial interaction:

Hypothesis 3: The effect of financial development on economic growth is not conditional on and amplified by the level of institutional quality in Sub-Saharan Africa.

Material and Methods. This study considers Sub-Saharan region, more specifically, 40 countries were chosen based on data availability for these economies. The 12-year period is covered, spanning between 2008 and 2023, which was dictated by the years of consistent records for the selected economies, particularly because of the inclusion of institutional quality indicators. Data for all variables were sourced from the World Bank, specifically from the World Development Indicators (WDI) and the Worldwide Governance Indicators (WGI) databases.

Model Specification. In order to test the hypotheses empirically, the research utilizes dynamic panel data analysis. Three econometric models are outlined in order to explore the effects of financial development, institutional quality, and economic growth.

Model 1: Effect of Financial Development on Growth. This model examines the direct impact of each financial development indicator on economic growth, controlling for other relevant factors. The model is specified as:

$$GDPG_{it} = \beta_0 + \beta_1 DCP_{it} + \beta_2 BM_{it} + \beta_3 BLR_{it} + \beta_4 OPEN_{it} + \beta_5 INF_{it} + \mu_i + \delta_t + \varepsilon_{it}$$

Model 2: Effect of Institutional Quality on Growth. This model assesses the direct influence of each institutional quality indicator on economic growth. The model is specified as:

$$GDPG_{it} = \beta_0 + \beta_1 RL_{it} + \beta_5 CC_{it} + \beta_6 GE_{it} + \beta_2 OPEN_{it} + \beta_3 INF_{it} + \mu_i + \delta_t + \varepsilon_{it}$$

Model 3: Interactive Model. This model investigates whether the effect of financial development on economic growth is conditional upon the level of institutional quality by including an interaction term. The model is specified as:

$$GDPG_{it} = \beta_0 + \beta_1 DCP_{it} + \beta_2 BM_{it} + \beta_3 BLR_{it} + \beta_4 RL_{it} + \beta_5 CC_{it} + \beta_6 GE_{it} + \beta_7 (DCP_{it} * RL_{it}) + \beta_8 (DCP_{it} * CC_{it}) + \beta_9 (DCP_{it} * GE_{it}) + \beta_{10} (BM_{it} * RL_{it}) + \beta_{11} (BM_{it} * CC_{it}) + \beta_{12} (BM_{it} * GE_{it}) + \beta_{13} (BLR_{it} * RL_{it}) + \beta_{14} (BLR_{it} * CC_{it}) + \beta_{15} (BLR_{it} * GE_{it}) + \beta_{16} OPEN_{it} + \beta_{17} INF_{it} + \mu_i + \delta_t + \varepsilon_{it}$$

Where:

$GDPG_{it}$: GDP per capita growth (annual%); DCP_{it}: Domestic credit to private sector (% of GDP); BM_{it}: Broad money (% of GDP); BLR_{it}: Bank liquid reserves to bank assets ratio (%); RL_{it}: Rule of Law; CC_{it}: Control of Corruption; GE_{it}: Government Effectiveness; $OPEN_{it}$: Trade Openness (% of GDP); INF_{it}: Inflation, consumer prices (annual%); μ_i: Unobserved country-specific effects; δ_t: Time-specific effects; ε_{it}: Idiosyncratic error term.

Data Analysis Technique. The study employs a panel data estimation technique to analyze the relationship between financial development, institutional quality, and economic growth in Sub-Saharan Africa from 2008 to 2023. Three alternative estimators, Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE), and Random Effects (RE), are employed. The choice of the most appropriate model will be determined by formal specification tests: the F-test will determine whether FE is preferable to Pooled OLS; the Breusch — Pagan Lagrange Multiplier (LM) test will determine whether RE is preferable to Pooled OLS; and the Hausman test will select between FE and RE based on consistency and efficiency of the estimators. All estimations will employ robust standard errors to address potential heteroskedasticity and serial correlation, ensuring reliable inference.

Empirical Results. The descriptive statistics for Sub-Saharan African countries from 2008 to 2023 reported in Table 1 highlight the significant economic, financial, and institutional heterogeneity in the region.

Table 1

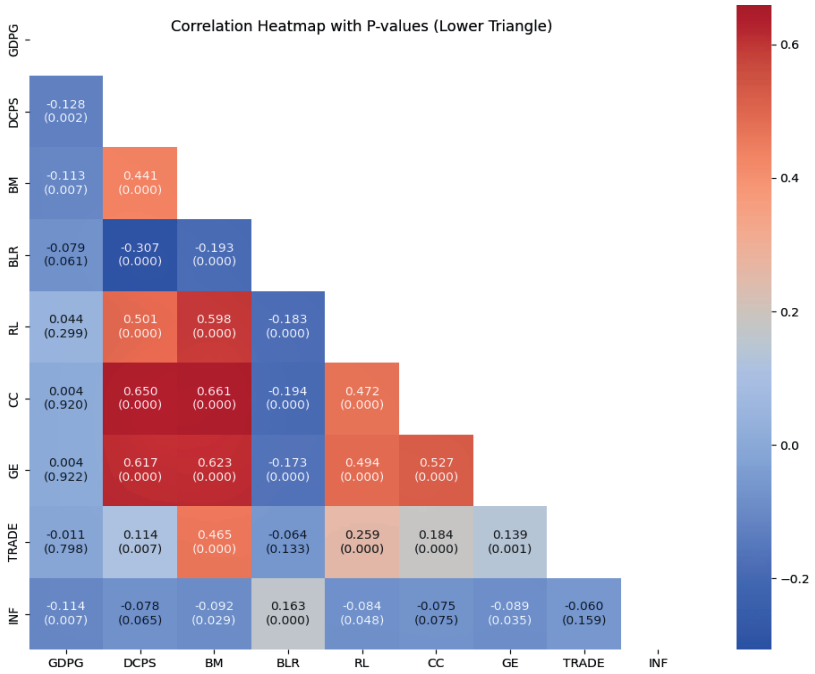
Summary Statistics of the Variables

Variables	Obs.	Mean	Std. Dev	Min.	Max.
GDPG	560	3.929	4.495	–20.805	21.452
DCPS	560	23.762	23.798	0.003	128.838
BM	560	35.934	23.948	0.015	159.949
BLR	560	20.066	16.37	2.243	125.081
RL	560	–0.547	0.693	–1.646	1.699
CC	560	–0.656	0.616	–1.806	1.150
GE	560	–0.578	0.607	–1.870	1.024
TRADE	560	77.706	51.452	3.831	347.997
INF	560	7.924	28.557	–16.86	557.202

Explanatory Notes: *GDPG is Gross Domestic Product Growth; DCPS is Domestic Credit to Private Sector; BM is Broad Money; BLR is Bank Liquidity Reserves; RL is Rule of Law Index; CC is Control of Corruption Index; GE is Government Effectiveness; TRADE is Trade Openness (% of GDP); INF is Inflation Rate*

Average GDP growth (GDPG) over the period is 3.93%, but the high standard deviation (4.50) and extreme range between –20.81% and 21.45% reveal instances of both severe contraction — often related to global crises, commodity price shocks, or domestic instability — and high expansionary phases. Financial development measures have huge disparities: domestic credit to the private sector (DCPS) averages 23.76% of GDP with some economies with very low credit penetration and others well over 120%, while broad money (BM) averages 35.93% and bank liquidity reserves (BLR) 20.07%, both with considerable variation. Institutional quality measures — rule of law (RL), control of corruption (CC), and government effectiveness (GE) — all have negative average scores, indicating generally weak governance institutions, though some countries achieve moderately positive scores. Trade openness (TRADE) averages 77.71% of GDP, but the enormous range (3.83% to 347.99%) indicates dramatic differences in international market integration. Inflation (INF) averages 7.92%, but the extremely high variability and extreme high of 557.20% reflect chronic macroeconomic instability and episodic hyperinflationary experiences in the region during the study period.

Correlation Analysis. This section presents the relationship that exists between different pairs of variables in an attempt to investigate the probable existence of multicollinearity.



Heatmap Showing Relationship Across Different Pairs of Variables

The Figure correlation matrix show statistically significant relationship between GDP growth and each of domestic credit to private sector, broad money, and inflation rates. Financial development indicators, domestic credit to the private sector (DCPS) and broad money (BM), are strongly and significantly correlated with each other and with institutional quality measures (rule of law, control of corruption, and government effectiveness). Institutional measures are moderately strongly correlated. But all the correlation coefficients are below the 0.8 threshold, with no standing multicollinearity problem based on correlations coefficients. This means variables are fine to include together in regression analyses.

Unit Root Tests for Stationarity. Panel data econometric testing for stationarity is a valuable first step before model estimation, as unit roots can distort results as well as contribute to spurious results. In cross-country studies such as Sub-Saharan African ones where the time series as well as cross-sectional aspects exist, panel unit root tests provide more accurate results than country-specific tests by leveraging combined information across the countries.

Table 2

Fisher-Type Augmented Dickey Fuller Unit Root Test

Variable	Inverse Chi-sq (P)	Inverse Normal (Z)	Inverse Logit t (L*)	Modified Inv. Chi-sq (Pm)	Order of Integration
GDPG	494.832 (0.000)	–19.865 (0.000)	–34.309 (0.000)	57.854 (0.000)	I (0)
DCPS	576.087 (0.000)	–22.150 (0.000)	–39.943 (0.000)	68.011 (0.000)	I (0)
BM	581.569 (0.000)	–22.230 (0.000)	–40.323 (0.000)	68.696 (0.000)	I (0)
BLR	514.852 (0.000)	–20.641 (0.000)	–35.697 (0.000)	60.357 (0.000)	I (0)
RL	355.002 (0.000)	–16.549 (0.000)	–24.614 (0.000)	40.375 (0.000)	I (0)
CC	433.308 (0.000)	–18.732 (0.000)	–30.043 (0.000)	50.164 (0.000)	I (0)
GE	398.965 (0.000)	–17.765 (0.000)	–27.662 (0.000)	45.871 (0.000)	I (0)
TRADE	471.377 (0.000)	–19.717 (0.000)	–32.683 (0.000)	54.922 (0.000)	I (0)
INF	482.018 (0.000)	–15.065 (0.000)	–31.112 (0.000)	56.252 (0.000)	I (0)

Explanatory Notes: *GDPG is Gross Domestic Product Growth; DCPS is Domestic Credit to Private Sector; BM is Broad Money; BLR is Bank Liquidity Reserves; RL is Rule of Law Index; CC is Control of Corruption Index; GE is Government Effectiveness; TRADE is Trade Openness (% of GDP); INF is Inflation Rate*

The Fisher-type unit root test statistics reveal that all the variables, namely GDPG, DCPS, BM, BLR, RL, CC, GE, TRADE, and INF, are level stationary. For all four test statistics (Inverse Chi-squared, Inverse Normal, Inverse Logit t, and Modified Inverse Chi-squared), p-values are 0.0000, which suggest rejection of the null hypothesis of all panels being unit-rooted. This ensures that there exists a minimum of one stationary panel for each variable, satisfying the stationarity requirement for panel data estimation.

Table 3

Model Selection Between Fixed Effects, Random Effects, and Pooled OLS

Model	Comparison Between Pooled OLS and Fixed Effects			Comparison Between Pooled OLS and Random Effects			Comparison Between Fixed Effects and Random Effects			Overall Conclusion on which of the Pooled OLS, /Fixed Effects, and Random Effects model is best
	Test Stats	p-value	Decision on which is superior	Test Stats	p-value	Decision on which is superior	Test Stats	p-value	Decision on which is superior	
1	9.24	0.000	Fixed Effect	283.38	0.000	Random Effect	38.74	0.000	Fixed Effect	Fixed Effect
2	9.21	0.000	Fixed Effect	299.49	0.000	Random Effect	6.55	0.256	Random Effect	Random Effect
3	9.15	0.000	Fixed Effect	0.000	1.000	Pooled OLS	751.67	0.000	Fixed Effect	Fixed Effect

Source: Author's Computation (2025)

Model selection. The model selection tests in Table 3 between Pooled OLS, Fixed Effects (FE), and Random Effects (RE) estimators for the three model specifications are compared. For Model 1, the F-test rejects Pooled OLS against FE, the LM test prefers RE to Pooled OLS, and the Hausman test prefers FE

very strongly, thus FE is the preferred estimator. For Model 2, F-test and LM test reject Pooled OLS but the Hausman test (p = 0.256) fails to reject the null, i. e., RE is more efficient; therefore, RE is selected. For Model 3, F-test prefers FE over Pooled OLS, LM test does not have evidence for RE, and the Hausman test confirms FE, thus FE is the optimal selection. In general, FE is preferable in Models 1 and 3, while RE is preferable in Model 2.

Regression Analysis. This section reports the empirical results from the estimated panel data models, following the model selection procedures outlined earlier.

Estimation result for Financial Development Indicators. This subsection presents the Fixed Effects estimation outcomes for the financial development variables and their impact on economic growth.

Table 4

Fixed Effect Model Results with Robust Standard Error (Financial Development)

Variables	Coef.	T	p-value
DCPS	–0.040	–3.41	0.004
BM	0.015	0.58	0.572
BLR	–0.037	–3.27	0.005
TRADE	–0.006	–1.41	0.180
IN4	–0.009	–1.98	0.066
Constant	5.648	9.20	0.000
R-squared (Within)	0.070	-	-
F (5,15)	7.580	-	0.001
Breusch-Pagan Heteroskedasticity	2.620	-	0.105
Wooldridge Serial Autocorrelation	0.260	-	0.618
Average VIF	1.95	-	-

Explanatory Notes: *GDPG is Gross Domestic Product Growth; DCPS is Domestic Credit to Private Sector; BM is Broad Money; BLR is Bank Liquidity Reserves; TRADE is Trade Openness (% of GDP); INF is Inflation Rate*

The diagnostic tests for the Fixed Effects model indicate that the estimation is statistically reliable. The Breusch — Pagan test for heteroskedasticity yields a p-value of 0.105, failing to reject the null hypothesis of homoskedasticity, suggesting constant variance of the residuals. The Wooldridge test for serial autocorrelation produces a p-value of 0.618, indicating no evidence of first-order autocorrelation in the panel data. Furthermore, the average Variance Inflation Factor (VIF) of 1.95 is well below the conventional threshold of 10, confirming the absence of multicollinearity concerns. These results collectively validate the robustness of the model's standard errors and the reliability of the coefficient estimates.

The coefficient estimates reveal that domestic credit to the private sector (DCPS) has a significant negative effect on GDP growth (–0.040, p = 0.004), implying that higher credit levels are associated with slower economic growth in Sub-Saharan Africa. Bank liquidity reserves (BLR) also exert a significant negative influence (–0.037, p = 0.005), suggesting that higher reserve holdings may constrain productive lending and growth. Broad money (BM) shows a positive but statistically insignificant effect (0.015, p = 0.572), while trade openness (TRADE) is negative and insignificant (–0.006, p = 0.180). Inflation (INF) is negative and marginally significant at the 10% level (–0.009, p = 0.066), indicating that higher inflation may dampen growth in the sub-Saharan Africa. The model's within R^2 of 0.070 and significant F-statistic (p = 0.001) confirm that, despite modest explanatory power, the included variables jointly have a statistically significant impact on economic growth.

Estimation result for Institutional Quality Indicators. This subsection presents the Random Effects estimation results assessing the impact of institutional quality measures, alongside trade openness and inflation, on economic growth in Sub-Saharan Africa.

Table 5

Random Effect Model Results with Robust Standard Error (Institutional Quality)

Variables	Coef.	T	p-value
RL	1.705	2.60	0.009
CC	-.392	–0.66	0.507
GE	–1.341	–1.63	0.102

Окончание таблицы 5

Variables	Coef.	T	p-value
TRADE	-.006	–2.55	0.011
INF	-.015	–2.89	0.004
Constant	4.404	6.01	0.000
R-squared (Within)	0.041	-	-
F (5,15)	20.29	-	0.001
Breusch-Pagan Heteroskedasticity	9.21	-	0.002
Wooldridge Serial Autocorrelation	1.314	-	0.269
Average VIF	5.02	-	-

Explanatory Notes: *GDPG is Gross Domestic Product Growth; RL is Rule of Law Index; CC is Control of Corruption Index; GE is Government Effectiveness; TRADE is Trade Openness (% of GDP); INF is Inflation Rate*

The diagnostic tests for the Random Effects model suggest that the estimates are typically valid, with some caveats. The Breusch — Pagan test for heteroskedasticity is rejected at p = 0.002, but using robust standard errors resolves this problem and allows for valid inference. The Wooldridge test for serial autocorrelation gives a p-value of 0.269, and there does not appear to be first-order autocorrelation in the panel data. The average Variance Inflation Factor (VIF) measure of 5.02 is considerably below the conventional threshold of 10 and indicates that multicollinearity is not a problem among the explanatory variables.

The results show that the rule of law (RL) is statistically and positively significant with GDP growth (coef. = 1.705, p = 0.009), suggesting that good legal and institutional arrangements are positively correlated with improved economic growth in the region. Control of corruption (CC) is statistically insignificant but negative, while government effectiveness (GE) is negative and marginally insignificant at the 10% level (p = 0.102). Trade openness (TRADE) has a small but statistically significant negative coefficient (— 0.006, p = 0.011), which indicates that higher trade exposure can be linked with slow growth here. Inflation (INF) is negative and significant (— 0.015, p = 0.004), implying that higher inflation rates are slowing down economic performance. In an R^2 of 0.041 and statistically significant F-statistic (p = 0.001) support the fact that despite weak explanatory power, the variables entered as a group have a statistically significant impact on growth.

Estimation result for Interaction between Financial Development and Institutional Quality. This subsection presents the Fixed Effects estimation results assessing the moderating effect of institutional quality on the relationship between financial development and economic growth, alongside trade openness and inflation, on economic growth in Sub-Saharan Africa.

Table 6

Fixed Effect Model Results with Robust Standard Error (Interactive Model)

Variables	Coef.	T	p-value
DCPS	–0.057	–4.04	0.001
BM	0.012	0.5	0.623
BLR	–0.042	–2.24	0.034
RL	3.883	3.23	0.006
CC	1.09	0.47	0.643
GE	–2.711	–1.14	0.271
DCPS*RL	–0.015	–0.5	0.621
DCPS*CC	0.088	2.17	0.037
DCPS*GE	–0.067	–1.29	0.216
BM*RL	–0.035	–1.25	0.231
BM*CC	–0.053	–1.17	0.260
BM*GE	0.057	1.14	0.274
BLR*RL	–0.032	–2.74	0.014
BLR*CC	–0.047	–0.8	0.439

Окончание таблицы 6

Variables	Coef.	T	p-value
BLR*GE	0.067	1.03	0.320
TRADE	–0.009	–1.63	0.124
INF	–0.009	–2.33	0.029
Constant	7.249	6.5	0.000
R-squared (Within)	0.092	-	-
F (5,15)	3.13	-	0.000
Breusch-Pagan Heteroskedasticity	26.91	-	0.000
Wooldridge Serial Autocorrelation	0.077	-	0.785

Explanatory Notes: *GDPG is Gross Domestic Product Growth; DCPS is Domestic Credit to Private Sector; BM is Broad Money; BLR is Bank Liquidity Reserves; RL is Rule of Law Index; CC is Control of Corruption Index; GE is Government Effectiveness; TRADE is Trade Openness (% of GDP); INF is Inflation Rate. Others are interaction between financial development indicators and institutional quality.*

The tests for the interactive Fixed Effects model are ambiguous. The Breusch — Pagan test for heteroskedasticity yields a p-value of 0.000, indicating that there is heteroskedasticity; robust standard errors solve this issue, and the inference is valid. The Wooldridge test for serial autocorrelation yields a p-value of 0.785, indicating that there is no first-order serial autocorrelation in the panel data. The within R^2 of 0.092 indicates that the model explains about 9.2% of variation in GDP growth among countries over time, while the overall F-statistic ($p = 0.000$) confirms that the specified variables taken as a whole are significant.

Findings show that domestic credit to the private sector (DCPS) significantly negatively affects GDP growth (–0.057, $p = 0.001$), and bank liquidity reserves (BLR) have a significant negative effect (–0.042, $p = 0.034$). Among institutional quality indicators, the rule of law (RL) is positive and significant (3.883, $p = 0.006$), meaning that more effective legal systems enable growth. Of special significance is the interaction between DCPS and control of corruption (DCPS*CC), which is positive and significant (0.088, $p = 0.037$), indicating that the growth impact of private sector credit becomes higher if corruption control is improved. As a counter example, the interaction between BLR and RL is negative and significant (–0.032, $p = 0.014$), indicating that there may be dampening of the growth impacts of strong legal institutions with high liquidity reserves. Inflation (INF) is highly significant and negative (–0.009, $p = 0.029$), while other interaction terms are not significant.

Discussion. The three model specifications indicate the existence of complex associations between economic growth, financial development, and institutional quality in Sub-Saharan Africa between 2008 and 2023 as the empirical evidence indicates. The financial development model indicates that the domestic credit to the private sector (DCPS) and bank liquidity reserves (BLR) have high negative impacts on the growth with the implication that credit growth and surplus liquidity are not being invested productively. This confirms the finance-growth paradox in certain economies in the developing world in which financial deepening does not generate growth because intermediation efficiency is poor, Chigeto et al [28]. The adverse and statistically insignificant impact of inflation is in agreement with the monetarist perspective that price volatility deteriorates investment and long-run growth.

Under the institutional quality concept, rule of law (RL) is found to be one of the most positive components of growth, which is in line with Tinta [29], who highlights the importance of the legal institutions in safeguarding property rights and contracting. But the measure of control of corruption (CC) and government effectiveness (GE) are statistically insignificant, which suggests indirect or conditional growth effects. The adverse and substantial effects of trade openness (TRADE) are in support of Afolabi and Oyeleke [8], who believe that openness in the absence of competitiveness power subjects economies to external shocks. The interaction model indicates that the growth impact of credit in the private sector rises with the enhancement of corruption control (DCPSCC) and this confirms the institutional quality conjecture [17]. The adverse experience of the interaction between the two is that the opposite is the case as some liquidity may still limit credit and growth despite effective legal frameworks.

These results are consistent with the endogenous growth theory [13, 14], which emphasizes the mutual impact of institutions and finance on the long-term growth. Rule of law and the institutional theory of North [16] is positively correlated, whereas the negative DCPS and BLR coefficients signify the financial re-

pression hypothesis [14, 15]. The large DCPS, CC term validates the theory of finance-institution nexus, Demetriades and Hook Law [30] and the experimental results of inflation and trade are in line with classical monetary and new trade theories.

Conclusion and Future Directions. This study explored the complex interlinkages among financial development, institutional quality, and economic growth in Sub-Saharan Africa. The empirical findings herald a reality: financial development, particularly domestic credit, may not necessarily translate into economic growth and may even be detrimental in low-quality institutional environments. In contrast, the rule of law appears to be a robust and significant driver of economic progress. Most notably, the study confirms that the conditional effect of financial development does exist. Specifically, private sector credit's pro-growth effect is significantly enhanced whenever corruption is effectively contained, as predicted by the complementary relationship between financial and institutional reforms.

Based on these findings, the following policy recommendations are proposed:

i. Policy makers must discuss the reinforcement of the rule of law and anti-corruption frameworks as a prerequisite for prudent financial sector policies. This involves ensuring enforcement of contracts, protecting property rights, and fostering openness.

ii. Instead of pursuing financial liberalization in isolation, it should be pursued by governments through a coordinated effort wherein deepening of finance is supplemented by targeted effort at governance enhancement such that credit is utilized appropriately.

iii. As high bank liquidity and credit expansion had adverse effects, there is a need to step up banking supervision and prudential regulation to improve intermediation efficiency and prevent resource misallocation.

REFERENCES

1. Hussen M. S. Institutional quality and economic growth in Sub-Saharan Africa: A panel data approach. Journal of Economics and Development. 2023. Vol. 25, No. 4. Pp. 332–348. https://www.doi.org/10.1108/JED-11–2022–0231 /

2. Ahmed F., Kousar S., Pervaiz A., Shabbir A. Do institutional quality and financial development affect sustainable economic growth? Evidence from South Asian countries. Borsa Istanbul Review. 2022. Vol. 22. No. 1. Pp. 189–96. https://doi.org/10.1016/j. bir. 2021.03.005 /

3. Wandeda D. O., Masai W., Nyandemo S. M. Institutional quality and economic growth: evidence from Sub-Saharan Africa countries. African Journal of Economic Review. 2021. Vol. 9. No. 4. Pp. 106–25. https://doi.org/10.4314/ajer. v9i4 /

4. Abaidoo R., Agyapong E. K. Financial development and institutional quality among emerging economies. Journal of Economics and Development. 2022. Vol. 24, No. 3. Pp. 198–216. https://doi.org/10.1108/JED-08–2021–0135 /

5. Masila J. M., Nyamute W. I., Kisimbii, J. M. Financial development and economic growth: Evidence from Sub-Saharan Africa. IOSR Journal of Economics and Finance. 2025. Vol. 16. No. 3. Pp. 34–40.

6. Aluko O. A., Ibrahim M. Institutions and the financial development — economic growth nexus in sub-Saharan Africa. Economic Notes. 2020. Vol. 49. No. 3, e12163. https://doi.org/10.1111/ecno. 12163 /

7. Suhaibu I., Andani A., Anafo S. A. The impact of institutional quality on living standards: Evidence from 20 sub-Sahara African (SSA) countries. Journal of development and agricultural economics. 2022. Vol. 14. No. 1. Pp. 20–9. https://doi.org/10.5897/JDAE2022.1333 /

8. Afolabi J. A., Raifu I. A. Toward economic resilience in Sub-Saharan Africa: The role of institutional quality and human capital development. Sustainable Development. 2025. Vol. 33. No. 2. Pp. 2566–2578. https://doi.org/10.1002/sd. 3251 /

9. Adu-Darko E. A. The Role of Institutional Quality and Financial Development in Economic Growth in Sub-Saharan Africa — Linear and Non-linear Analysis with Structural Breaks. African Review of Economics and Finance. 2024. Vol. 16. No. 1. Pp. 221–238.

10. Egbetunde T., Akinlo A. E. Financial globalization and economic growth in sub-Saharan Africa: The role of institutional quality. Acta Universitatis Danubius. Œconomica. 2019. Vol. 15. No. 4. Pp. 30–46.

11. Solow R. M. A contribution to the theory of economic growth. The Quarterly Journal of Economics. 1956. Vol. 70, No. 1. Pp. 65–94. https://doi.org/10.2307/1884513 /

12. Romer P. M. Increasing returns and long-run growth. Journal of political economy. 1986. Vol. 94, No. 5. 1002–37. https://doi.org/10.1086/261420 /

13. Lucas Jr R. E. On the mechanics of economic development. Journal of Monetary Economics. 1988. Vol. 22. No. 1. Pp. 3–42. https://doi.org/10.1016/0304–3932 (88) 90168–7 /

14. McKnnon R. 1. Money and capital in economic development. The Collapse of Development Planning. Washington, DC, 1973.

15. Shaw E. S. Financial deepening in economic development. New York, 1973.

16. North D. C. Institutions, institutional change and economic performance. Cambridge, 1990.

17. Kassıe N. M. THE effects of financial development on economic growth in africa: does the quality of institutions matter? Journal of Business Economics and Finance. 2021. Vol. 10. No. 4. Pp. 166–77. https://doi.org/10.17261/Pressacademia. 2021.1462 /

18. Asante G. N., Takyi P. O., Mensah G. The impact of financial development on economic growth in sub-Saharan Africa. Does institutional quality matter? Development Studies Research. 2023. Vol. 10. Vol. 1. 2156904. https://doi.org/10.1080/21665095.2022.2156904 /

19. Mbulawa S., Chingoiro S. Financial development, institutional quality and economic growth in countries in sub-Saharan Africa (SSA). International Journal of Business Ecosystem & Strategy. 2024. Vol. 6. No. 1. Pp. 51–62. https://doi.org/10.36096/ijbes. v6i1.461 /

20. Mbuyi A. K., Mulumba E. M. Financial development and economic growth in the Southern African Development Community (SADC): The role of institutional quality. Journal of Financial Risk Management. 2022. Vol. 11. No. 2. Pp. 296–310. https://doi.org/10.4236/jfrm. 2022.112015 /

21. Appiah M., Li F.., Frowne DI. Financial development, institutional quality and economic growth: evidence from ECOWAS countries. Organizations and Markets in Emerging Economies. 2020. Vol. 11. No. 1. Pp. 6–17. https://doi.org/10.15388/omee. 2020.11.20 /

22. Bandura W. N., Dzingirai C. Financial development and economic growth in Sub-Saharan Africa: The role of institutions. PSL Quarterly Review. 2019. Vol. 72. No. 291. Pp. 315–334. https://doi.org/10.13133/2037–3643_72.291_5 /

23. Abdulwahab L. O. The role of Institutional quality, human capital development on economic growth in Sub-Saharan Africa. International Journal of Business Economics (IJBE). 2023. Vol. 5. No. 1. Pp. 92–115. https://doi.org/10.30596/ijbe. v5i1.16161 /

24. Afolabi O. E., Oyeleke O. J. Institutional Quality and Inclusive Growth in sub-Sahara Africa: Evidence from Panel ARDL. Redeemer's University Journal of Management and Social Sciences. 2024. Vol. 7. No. 1. Pp. 66–83.

25. Berhane K. The role of financial development and institutional quality in economic growth in Africa in the era of globalization. In Determinants of economic growth in Africa 2018 May 17 (pp. 149–196). Cham: Springer International Publishing.

26. Gyamfi N. M., Bokpin G. A., Aboagye A. Q., Ackah C. G. Financial development, institutional quality and inclusive growth in Africa. Global Business Review. 2022. Vol. 23. No. 3. Pp. 584–607. https://doi.org/10.1177/0972150919875367 /

27. Olaniyi C. O., Odhiambo N. M. Does institutional quality matter in the financial Development-Economic complexity Nexus? Empirical insights from Africa. Research in Globalization. 2023. Vol. 7. 100173. https://doi.org/10.1016/j. resglo. 2023.100173 /

28. Chigeto A. D., Jayamohan M. K., Ayeru E. Does financial development and institutional quality matter in South-South Trade? Evidence from sub-Saharan Africa. Research in Globalization. 2024. Vol. 8. 100209. https://doi.org/10.1016/j. resglo. 2024.100209 /

29. Tinta A. A. Financial development, ecological transition, and economic growth in Sub-Saharan African countries: the performing role of the quality of institutions and human capital. Environmental Science and Pollution Research. 2022. Vol. 29. No. 25. Pp. 37617–37632. https://doi.org/10.1007/s11356–021–18104-y /

30. Demetriades P., Hook Law S. Finance, institutions and economic development. International Journal of Finance & Economics. 2006. Vol. 11. No. 3. Pp. 245–60. https://doi.org/10.1002/ijfe. 296 /

Поступила в редакцию: 04.01.2026.
Принята к печати: 10.03.2026.