

## How Institutional Quality Drives Financial Advancement in Sub-Saharan Africa

Dr. Adeyinka Emmanuel Adeyemi<sup>1</sup>, Chikaodinaka Okwunka<sup>2</sup>, Patience. N. Tasie<sup>3</sup>

<sup>1</sup>Department of Cooperative Economics, Ogbonnaya Onu Polytechnic, Aba, Abia State. <https://orcid.org/0000-0002-0737-1248>

<sup>2</sup>Department of Cooperative Economics, Ogbonnaya Onu Polytechnic, Aba, Abia State.

<sup>3</sup>Department of Business Administration, Ogbonnaya Onu Polytechnic, Aba, Abia State.

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**Corresponding Author:**  
Dr. Adeyinka Emmanuel Adeyemi

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**ABSTRACT**

This study investigates the impact of institutional quality on financial advancement in Sub-Saharan Africa, leveraging institutional theory to guide variable selection and empirical linkage. Employing a panel dataset, the study uses descriptive statistics, Pearson correlation, unit root, and multicollinearity tests to assess variable properties, followed by panel estimation methods, including the Poolability, Hausman, and Breusch-Pagan tests, to select the best model fit. The results indicate that lower institutional quality significantly reduces financial advancement, as confirmed across Fixed, Random, and PCSE models. Real interest rates positively correlate with financial advancement, while GDP per capita and inflation effects are insignificant. The Dumitrescu-Hurlin test reveals a unidirectional causality from institutional quality to financial advancement, suggesting institutional quality as a predictor. The findings emphasize the importance of strengthening institutional frameworks to foster financial advancement and recommending policy reforms to enhance governance and economic stability for sustainable regional development

### INTRODUCTION

Financial advancement or development refers to improving and expanding financial markets and institutions, which facilitate the efficient allocation of resources, risk management, and economic growth. It encompasses establishing and enhancing financial instruments, markets, and intermediaries that mobilize savings, allocate capital, and facilitate trade (Khan et al., 2020). Financial development/advancement also involves regulatory frameworks that ensure stability, transparency, and trust in the financial system. The ultimate goal is to create a robust financial infrastructure that supports sustainable economic development and improves access to financial services for all segments of society (Kwakwa et al., 2023).

Globally, financial development/advancement has been a key driver of economic growth, especially in developed economies. Advanced financial systems, characterized by diverse and deep capital markets, sophisticated financial instruments, and well-regulated institutions, have significantly contributed to innovation, productivity, and economic stability. For instance, the United States and Western Europe have long benefited from mature financial markets that support business expansion and consumer spending. Emerging markets, particularly in Asia and Latin America, have also made considerable strides in financial development, leveraging technological advancements and regulatory reforms to deepen their financial sectors. Global financial integration has facilitated cross-border investments and capital flows, further enhancing economic growth and development (Global Financial Report, 2020).

In sub-Saharan Africa, financial development/advancement has been uneven and generally lags behind other regions. While some countries have made notable improvements, many African nations still struggle with underdeveloped financial systems characterized by limited access to financial services, shallow capital markets, and inadequate regulatory frameworks (Ustarz & Fanta, 2021). South Africa and Nigeria, for example, have relatively advanced financial sectors compared to their regional peers, but many other countries in the region remain heavily reliant on informal financial systems. Mobile banking and fintech innovations have shown promise in bridging some of these gaps, particularly in East Africa, where mobile money platforms like M-Pesa have revolutionized

access to financial services. Several challenges hinder financial development in sub-Saharan Africa. Key issues include inadequate infrastructure, both physical and technological, which limits the reach and efficiency of financial services. Political instability and weak regulatory environments further undermine confidence in financial institutions and deter investment. A large informal economy and low levels of financial literacy among the population restrict the adoption of formal financial services. High levels of poverty and income inequality also exacerbate the difficulty in expanding financial inclusion.

Several studies have investigated the factors that influence financial development in Africa and the world as a whole (see: Ashraf et al., 2018; Bashiru et al., 2023; Tongurai & Vithessonthi, 2023; Hussain et al., 2021). Most of these studies have exposed factors like openness (Ashraf et al., 2018); socioeconomic (Bashiru et al., 2023); and natural resources (Shahbaz et al., 2018) among others as determinants of financial development. In recent times, studies have focused on the influence of technology and institutional quality as factors that influence the financial system (see: Akinlo, 2023; Asongu & Nwachukwu, 2019; Charfeddine, Umlai, & El Masri, 2024). However, much has not been done in the area of institutional quality and how it affects financial development, especially in the sub-Saharan region as most of the countries from this region face institutional issues such as corruption, lack of rule of law, and government inefficiency among others. To continue with the debate on how institutional quality can influence financial development, and to contribute to the literature, this study tends to investigate the influence of institutional quality on sub-Saharan African financial development.

This study is essential because it contributes to existing research regarding the impact of institutional quality on financial development in sub-Saharan Africa. While various factors influencing financial development have been identified, the specific influence of institutional issues like corruption, lack of rule of law, and government inefficiency remains underexplored in this region. Given the unique challenges sub-Saharan African countries face, this study aims to contribute to the literature by providing insights that could inform policy decisions and strategies to enhance financial development, thereby promoting economic growth and stability.

## **1. RELATED LITERATURE REVIEW**

As a sequel to the impact of financial development on economic growth, several studies have focused on the determinants of financial development over time. Huang (2006), employing panel data techniques on information spanning 43 developing countries from 1970 to 1998, conducted a thorough examination of the causality relationship between aggregate private investment and financial development. Through GMM estimation on averaged data and a common factor approach on annual data, accommodating universal interdependence and heterogeneity across countries, the results support positive causal effects in both directions.

Baltagi et al (2007), using panel data techniques and annual data, proved that trade openness and financial openness together with economic institutions determine the financial development dissimilarity across countries. Their results showed that least open countries can benefit greatly in terms of financial development if they open either their trade or capital accounts. Adam and Tweneboah (2008) examine the impact of foreign direct investment (FDI) on the stock market development in Ghana using multivariate cointegration and error correction models. The empirical results from the study showed that there is a long-run relationship between foreign direct investment, nominal exchange rate, and stock market development in Ghana.

The factors that influence financial development were examined by Voghouei et al. in 2011. Institutions, openness of trade and financial markets, legal tradition, and political economy are identified as factors promoting the financial system. Political and economic factors might be the ones that have the greatest influence on financial development because they can affect it directly as well as indirectly through other determinants. Variations in the political economy of countries could well explain variations in their financial development. Bittencourt (2011) observed the influence of inflation on financial development in Brazil using time-series data that cover the period between 1985 and 2004. The study employs panel time series and panel data analyses. The empirical results suggest that inflation presented harmful effects on financial development during the period investigated. According to the author, the main inference of the results is that poor macroeconomic performance has negative effects on financial development.

Imran and Nishat (2012) conducted a study on determinants of bank credit in Pakistan, using the supply-side approach for the period between 1971 and 2010. The study employs the ARDL method. Concluded that in the long run foreign liabilities, domestic deposits, economic growth, exchange rate, and monetary conditions (proxy by M2 as a percentage of GDP) have significant and positive associations with private credit, while inflation and money market rate do not affect private credit. Likewise, in the short-run, all the factors are significant and positively connected with private credit except domestic deposit and inflation which do not affect the private credit in Pakistan. The authors speculate that because banks do not immediately grant credits from the current deposits made by account holders, domestic deposits may not have a short-term impact on bank credit. Finally, the researcher sought to identify the influence of financial liberalization on bank credit, using it as a dummy variable. However, the result does not show any impact of the financial liberalization on bank credit in Pakistan.

Takyi and Obeng (2013), using the Autoregressive Distributed Lag (ARDL) approach, investigate the determinants of financial development in Ghana using quarterly data from 1988 to 2010. The study found a unique cointegrating relationship between financial development trade openness, inflation, per capita income, reserve requirement, and government borrowing. The regression results showed that trade openness and per capita income are important determinants of financial development in Ghana.

Additionally, inflation, interest rate, and reserve requirement exercised negative and statistically significant effects on financial development both in the short-run and long-run suggesting that these variables adversely influence financial development in Ghana. However, government borrowing did not have any significant effect on financial development both in the long run and short run suggesting that higher government borrowing from the banking sector will not have any significant effect on private credit or even crowd in private sector credit.

Assefa (2014) examines the short and long-run impact of bank monetary policy and macroeconomic variables such as domestic deposit, foreign liabilities, lending interest rate, and reserve requirement, M2 as a percentage of GDP, GDP and inflation on bank credit to the private sector in Ethiopia, using data from 1978 to 2011. The methodology, based on the ARDL econometric approach using annual time-series data was employed. The finding specified that domestic deposits, foreign liabilities, real lending interest rate, M2 as a percentage of NGDP, GDP, and inflation have significant impacts on banks' credit to the private sector in the long run. Whereas reserve requirements did not affect commercial banks' credit to the private sector both in the long and short run. Domestic deposit growth and economic expansion have little effect on commercial banks' short-term lending to the private sector. The result showed a rapid adjustment process and dictates that the disequilibrium of the previous period shocks is adjusted into long-run equilibrium in the current period.

Shabbir et al (2020) studied the determinants of financial development in Pakistan and collected data between 1995 and 2015 using regression analysis and correlation analyses. They used five factors and measured their impact on financial development. Factors such as Inflation, trade openness, market capitalization, investment rate, and interest rate were used to measure their role as determinants of financial development. The empirical results show that all variables inflation, trade openness, market capitalization, investment rate, and interest rate have a significant impact on financial development.

However, in recent times, several scholars have delved into the impact of governance and institutional quality on financial development and it continues. Olarinde and Yahaya (2018) investigated the impact of institutions and policies on growth convergence in Africa, employing various panel modeling methods on a dataset encompassing 50 African countries from 1990-2014. The findings revealed the existence of conditional convergence among these nations. Notably, technology accumulation and fiscal policy indicators exhibit a positive association with growth. In contrast, negative influences on growth stem from human resources, monetary policy indicators, and ineffective institutions, the latter often linked to poor development. The study concludes that, despite the significance of traditional growth variables and policies in income growth, their efficacy is limited in an environment characterized by extractive and absolutist institutions.

Ali et al. (2022) investigated the impact of institutional quality as a moderating factor in the relationship between financial inclusion and substantial financial development across 45 countries in the Organization of Islamic Cooperation. The study utilized panel data spanning from 2000 to 2016. It employed the Arellano–Bond generalized method of moments (GMM) and two-stage least-squares (2SLS) for estimations, producing significant and multifaceted results. The empirical findings validate a statistically significant positive correlation among financial inclusion, institutional quality, and financial development. The study's revelation is noteworthy that institutional quality significantly moderates financial inclusion, contributing a substantial positive impact on overall financial development. Cherif and Dreger (2016) examine the determinants of financial development in the Middle East and North African (MENA) countries. The study employs panel econometric methods to assess advancements in the banking sector and the stock market. A noteworthy discovery is that institutional factors hold significance in both financial domains, even when controlling for standard macroeconomic determinants and fixed effects. In the banking sector, corruption stands out as the most pivotal factor, whereas in the stock market, the influence of corruption and the state of law and order is considered significant.

Fhima (2018) investigates the impact of corruption on both the stability of the banking sector and economic development, employing the three-stage least squares for estimation. The results indicate that corruption exerts a considerable adverse influence on both financial stability and economic growth. In a related study, Abuzayed and Fayoumi (2016) explore the connection between economic growth and banking sector concentration, considering the role of institutional quality. The research focuses on a sample of 15 Middle East and North African (MENA) countries spanning the years 1996 to 2010. Through static and dynamic panel data analysis, the findings reveal a positive and statistically significant correlation between economic growth and both banking concentration and institutional quality. These results support the notion that banking concentration and institutional quality are crucial factors influencing growth in MENA countries. The study highlights a noteworthy negative and significant relationship between the interaction variable representing the combination of concentration and institutional quality.

Emara and Jhonsa (2014) utilized a Two-stage Least Square (TSLS) regression approach on cross-sectional data representing 197 countries in the year 2009 to evaluate the influence of improvements in governance quality on per capita income, as well as the impact of increases in per capita income on governance quality. The results reveal a robust and statistically significant causation from governance quality to per capita income. The findings show a statistically significant correlation between per capita income and governance quality. In a related study, Demetriades and Hook Law (2006) observed that a robust institutional framework within which the financial system operates enhances the positive impact of financial development on GDP per capita.

Hussain et al (2021) address the critical issue of sustainable development, focusing on the often-debated role of natural resources and extending the discourse to include human capital, innovation, and institutional quality. The study employs advanced econometric

techniques, including the dynamic common correlated effect estimator, cross-sectional autoregressive distributive lag (CS-ARDL), augmented mean group (AMG), and common correlated effect mean group (CCE-MG) estimators, to explore the interconnections. The findings reveal that in these high-income, resource-rich countries, natural resources act as blessings rather than curses. Human capital significantly promotes financial development, and institutional quality also supports financial development. These results indicate that the efficient utilization of both natural and human resources, bolstered by technological innovation, enables high-income countries to achieve their development goals.

Also, Khan et al (2020) explore the relationship between natural resource rent and financial development, focusing on the role of institutional quality in this dynamic across 87 Emerging and Developing Economies (EMDEs) from 1984 to 2018. The study finds that natural resource rent generally weakens financial development, supporting the natural resource curse hypothesis within the financial sector of EMDEs. However, institutional quality has a significant positive impact on financial development and moderates the adverse effects of natural resource rent. The authors argue that institutional quality can transform the natural resource curse into a blessing for the financial sector by influencing various channels through which the curse operates. Furthermore, the study identifies a threshold effect of institutional quality in the resource-finance relationship, revealing that natural resource rent positively contributes to financial development only when institutional quality surpasses a certain threshold level. Below this threshold, natural resource rent hinders financial development, reinforcing the resource curse. These findings emphasize the crucial role of institutional quality in mitigating the negative effects of natural resource dependence on financial development. Li et al. (2021) reinvestigated the resource curse hypothesis with a focus on the institutional failure hypothesis in G7 countries. Through evaluation of natural resource rents' linkages with financial development over four decades, they refute the resource curse hypothesis in the long run and identify a positive impact routed through financial markets, with evidence of bleeding in financial institutions due to natural resource abundance.

Bawuah (2023) examines the role of institutional quality in the relationship between mobile money and financial inclusion in Ghana. Through baseline regression analysis from 2014 to 2021, they find a positive direct effect of institutional quality and mobile money on financial inclusion, along with a positive moderating role of institutional quality in this relationship. Rubio Misas (2023) investigates the influence of institutional quality on the impact of supervisory power on insurer soundness. Using a two-step system generalized method of moments over the period 2009–2016, they find that national institutional quality mitigates the negative impact of supervisory power on insurer soundness. Ongo Nkoa et al (2023) examine the effect of political and legal institutions on the growth of financial markets in 50 African countries. Employing a system generalized method of moment strategy, they find that the quality of political and legal institutions explains financial market growth.

Sajid et al (2023) explore the association of financial inclusion and institutional quality with financial stability, employing a linear autoregressive distributed lag approach from 1990 to 2020. Their findings reveal a positive association of financial inclusion and institutional quality with financial stability. Khan et al (2024) focus on the influence of governance quality on stock market development in BRICS nations from 2007 to 2021. Through panel data regression, they find that governance indicators such as Government Effectiveness, Rule of Law, and Voice and Accountability significantly affect stock market development. Pal and Mahalik (2024) investigate the effects of remittances, foreign direct investment (FDI), and institutional quality on financial development in Europe & Central Asia vs. Sub-Saharan Africa. Utilizing a panel PMG-ARDL model over the period 1984–2020, they identify varying impacts of these factors on financial development between the two regions.

Despite wide research on the determinants of financial development, the specific role of institutional quality in shaping financial advancement in sub-Saharan Africa remains underexplored. Existing studies, such as those by Huang (2006), Baltagi et al (2007), and Adam and Tweneboah (2008), primarily focus on macroeconomic factors, trade openness, and foreign direct investment as key drivers of financial development. While Voghouei et al (2011) and Cherif and Dreger (2016) highlight the importance of institutions in financial development, their research is not region-specific and often encompasses broader geographic contexts. Recent investigations by Olarinde and Yahaya (2018), Ali et al (2022), and Khan et al (2020) emphasize the significance of institutional quality but focus on different regions, such as the Middle East and North Africa (MENA) or high-income countries, or address financial development indirectly through the lens of economic growth or natural resource management. As a sequel to this, there is a gap in the literature regarding the direct impact of institutional quality on financial development/advancement specifically within the sub-Saharan African framework. This gap highlights the need for targeted research to understand how institutional factors uniquely influence financial development in this region, considering its distinct economic, political, and social dynamics.

## **2. METHODOLOGY**

### **i. Theoretical Framework**

This study draws its theoretical foundation from institutional theory. The institutional theory posits that organizations and their behavior are shaped by the institutional environment in which they operate, including norms, values, beliefs, regulatory frameworks, laws and policies, and cultural, and social expectations. These institutional factors influence organizational structures, practices, and outcomes. They can also lead to similarities among organizations, legitimacy, reputation, access to resources and support, and constraints on innovation and change. It is as a sequel to this Asbackdrop that this study tends to investigate the effect of institutional



quality on financial market development via information and communication technology. Meanwhile, past studies (Khan et al., 2023; Nkoa et al., 2023) have focused on the impact of institutional quality on the financial market. For instance, Khan et al (2023) show that governance indicators such as Government Effectiveness, Rule of Law, and Voice and Accountability significantly affect stock market development. While Nkoa et al (2023) find that financial market growth is explained by the quality of political and legal institutions.

## ii. Model Specifications

To investigate the impact of Institutional quality on financial advancement, the study draws a foundation from the institutional theory which helps the choice of explanatory variables for the study and links the theoretical and empirical frameworks. As a sequel to this, the model of financial advancement is given thus in equation 1:

$$\text{Findev}_t = (\text{Inst}_{it}, \text{Gdppc}_{it}, \text{Intr}_{it}, \text{Inf}_{it}) \text{-----} (1)$$

By suggesting a linear econometric relationship between financial advancement and its suggested determinants, and after adding the intercept and error terms  $\alpha_0$  and  $\mu_{it}$  respectively. Thus, the econometric model specified for estimation is as shown in Equation 2 below:

$$\text{findev}_{it} = \alpha_0 + \alpha_1 \text{Inst}_{it} + \alpha_2 \text{Gdppc}_{it} + \alpha_3 \text{Intr}_{it} + \alpha_4 \text{Inf}_{it} + \mu_{it} \dots (2)$$

where:

Findev = Financial development

Inst = Institutional quality

Gdppc = Gross domestic product per capita

Intr = Interest rate

Inf = Inflation

$\alpha_1$  to  $\alpha_6$  = coefficient of the independent variables

$\mu_{it}$  = Error term

$i$  = country in the panel;

$t$  = year in the panel

Based on the model specified above with the theoretical and empirical justifications that have been discussed in the review of related literature, the following are inequality notations of the a priori expectations of each of the parameters of the model:

$\alpha_1 > 0$  or  $< 0$ ,  $\alpha_2 > 0$  or  $< 0$ ,  $\alpha_3 > 0$  or  $< 0$ , and  $\alpha_4 < 0$

To examine the direction of causality between financial development, and Institutional quality in SSA, this study adopts the pairwise Dumitrescu-Hurlin (2012) panel causality technique. The explanation for this is that it is a dynamic panel test that is more robust and effective in estimation. The Pairwise Dumitrescu-Hurlin test was developed on the Granger causality test and its merit over Granger causality is that it addresses the endogeneity problem associated with the panel causality test which is not considered by Granger and other causality tests. Thus, the following equations are used for this study:

$$\Delta \text{Findev}_{it} = \beta_1 + \sum_{k=1}^{p_1} \theta_{1ik} \Delta \text{Inst}_{it-k} + \sum_{k=1}^{p_2} \varphi_{1ik} \Delta \text{Findev}_{it-k} + \varepsilon_{1it} \dots \dots \dots 3$$

$$\Delta \text{Inst}_{it} = \beta_1 + \sum_{k=1}^{p_1} \theta_{1ik} \Delta \text{Findev}_{it-k} + \sum_{k=1}^{p_2} \varphi_{1ik} \Delta \text{Inst}_{it-k} + \varepsilon_{1it} \dots \dots \dots 4$$

where  $\Delta$  is the first difference operator;  $p_1$  and  $p_2$  are lag lengths;  $i$  represents the country in the panel ( $i = 1, 2, \dots, N$ );  $t$  is the year in the panel ( $t = 1, 2, \dots, T$ ); and  $\varepsilon_{it}$  denotes normally distributed stochastic term for all country  $i$  and at time  $t$ . All the remaining variables remain the same as stated in Equation 2.

## iii. Variables Description and Measurement.

Several scholars have used different variables as indicators of financial market development and other variables as financial market determinants. This section exposes the variables employed as well as their measurements for this study.

### a. Financial Market Development

Financial development refers to improving and expanding financial markets and institutions, which facilitate the efficient allocation of resources, risk management, and economic growth. It encompasses establishing and enhancing financial instruments, markets, and intermediaries that mobilize savings, allocate capital, and facilitate trade (Khan et al., 2020). The Financial Development Index (FDI) is a comprehensive measurement tool used to assess the level of development and efficiency of a country's financial system. It is designed to provide insights into the overall health and functionality of a nation's financial sector by considering various aspects and dimensions.

### b. Institutional Quality

Institutional quality refers to the effectiveness, efficiency, and integrity of institutions in supporting economic development, governance, social stability, and overall societal well-being (Alonso & Garcimartín, 2013). High-quality institutions contribute to a conducive environment for economic growth, innovation, and social cohesion, while poor institutional quality can hinder development and lead to corruption, inefficiency, and social unrest. Key components of institutional quality include governance, legal systems, public administration, and regulatory frameworks (Kunčič, 2014). However, this study employs institutional quality

components such as control of corruption, government effectiveness, voice and accountability, rule of law, and political stability from the World Development Indicators (WDI) to derive the institutional quality index via the Principal Component Analysis (PCA). Principal component analysis (PCA) is used to combine the residual series produced by each regression. The following linear combination exists because the first eigenvectors from the PCA are utilized as the necessary weights to produce an aggregated index for institutional quality:

$$\text{Inst} = \alpha_1 \text{Corr} + \alpha_2 \text{Goveff} + \alpha_3 \text{Polstab} + \alpha_4 \text{Rulaw} + \alpha_5 \text{Voca}$$

Where Inst is institutional quality,  $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ , and  $\alpha_5$  are the eigenvector from the Principal Component Analysis (PCA), Corr is control of corruption, Goveff is government effectiveness, Polstab is political stability, Rulaw is rule of law, and Voca is voice and accountability.

#### c. Gross Domestic Product per capita

Gross Domestic Product per capita (Gdppc) measures a country's economic output that accounts for its number of people. It is calculated by dividing the GDP by the total population of the country. This metric provides an average economic productivity or standard of living for an individual within the country and is often used to compare the economic performance of different countries or regions. Higher GDP per capita indicates a higher standard of living and better economic well-being of the population. GDP per capita is a crucial indicator of the potential for financial market development, reflecting the overall economic health and the capacity of a country to support and sustain a vibrant financial sector.

#### d. Interest Rate

Interest rates, as the cost of borrowing money or the return on investments, exert significant influence over both the economy and financial markets. They directly impact borrowing costs, with higher rates making borrowing more expensive and lower rates incentivizing borrowing and investment. Similarly, interest rates affect savings and investment behavior: higher rates encourage saving due to better returns, while lower rates prompt individuals and businesses to seek higher-yield investments. Financial markets are deeply influenced, as interest rates affect the valuation of assets such as bonds and stocks.

#### e. Inflation

Inflation refers to the rate at which the general level of prices for goods and services rises over time, leading to a decrease in the purchasing power of money. When inflation occurs, each unit of currency buys fewer goods and services than it did before. Inflation is measured by various indices, such as the Consumer Price Index (CPI) and the Producer Price Index (PPI), which track changes in the prices of a basket of goods and services over time. Inflation influences financial markets through its impact on interest rates, investor sentiment, asset valuations, and currency values.

**Table 1: Summary of the Data**

Variable	Indicator	Variable description	Unit of measurement	Source of data
Findev	Financial development	The Financial Development Index (FDI) is a comprehensive measurement tool used to assess the level of development and efficiency of a country's financial system. It is designed to provide insights into the overall health and functionality of a nation's financial sector by considering various aspects and dimensions.	Index	International Monetary Funds (IMF), 2022
Inst	Institutional quality	Proxy by the control of corruption, government effectiveness, voice and accountability, rule of law, and political stability	Index	Author's calculation (PCA)
Gdppc	Gross domestic product per capita	GDP per capita (constant 2015 US\$)	Million, Billion (\$)	World Bank, 2022
Intr	Real Interest rate	The percentage at which interest is paid on a loan or investment. The real interest rate is adjusted for inflation, reflecting the actual purchasing power of the interest earned or paid.	Percentage	World Bank, 2022
Inf	Inflation	The percentage in the consumer price index (CPI), is a weighted average of prices for a basket of goods and services.	Percentage	World Bank, 2022

**Source: International Monetary Fund, 2022, and World Bank Development Index, 2022.**

**iv. Data Source**

The dataset for this study consists of a panel of observations for 36 sub-Saharan African countries, covering annual data from 2000 to 2021. This sample is used to examine the impact of institutional quality on financial development. The countries included are Angola, Benin, Botswana, Burkina Faso, Cape Verde, Cameroon, Central Africa, Chad, Comoros, DR Congo, Republic of Congo, Côte d'Ivoire, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, and Zambia. Data sources include the World Development Index from the World Bank and the Financial Development Index from the International Monetary Fund.

**v. Analytical Techniques**

Before estimating the model, a descriptive analysis of the key variables will be conducted using descriptive statistics to understand their behavior and relationships. This includes providing estimates for the number of observations, mean, standard deviation, minimum, and maximum values across countries and time, across countries, and within each country over time. Pearson correlation measures the linear relationships between variables, where values close to +1 indicate a strong positive correlation and values close to -1 indicate a strong negative correlation. To detect multicollinearity, the correlation coefficients for each variable pair will be examined.

To avoid spurious regression results, stationarity tests are conducted. Different panel unit root tests address concerns like homogeneity, cross-sectional dependence, and small sample bias, which can affect dynamic panel analysis. The study uses the Augmented Dickey-Fuller (ADF) test via the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) methods to check for stationarity and the order of integration. The LLC method accounts for intercept heterogeneity, while the IPS method addresses heterogeneity in intercepts and slope coefficients. These methods are widely used and consistent in panel unit root tests.

The study employs static panel analysis. Static panel analysis is a statistical method used to analyze data collected over time from multiple individuals, entities, or groups. It is commonly employed in econometrics and social sciences to study the relationships between variables while accounting for individual and time-specific effects. There are three main models within static panel analysis: Ordinary Least Squares (OLS), Fixed Effect Model, and Random Effect Model. OLS is a standard regression technique used to estimate the relationship between a dependent variable and one or more independent variables while the fixed effect model accounts for individual-specific effects by including dummy variables for each individual or entity in the regression equation. The random effect model assumes that the individual-specific effects are random and uncorrelated with the independent variables. It incorporates a random error term to account for individual heterogeneity. (Gujarati and Porter, 2009).

The Poolability, Hausman, and Breusch-Pagan Lagrange Multiplier (LM) tests play a crucial role in guiding the selection among three methods (Pooled OLS, FEM, and REM). The Poolability test specifically determines whether the constant of a function should be treated as homogeneous or heterogeneous. It aids in identifying the suitable estimators, helping decide between a pooled regression following the OLS approach or adopting FEM. Before assessing the validity of fixed effects (distinct constants for various units), the standard F-test is utilized. This test is employed to determine the appropriate method between FEM and Pooled OLS methods. The null hypothesis posits that all constants are the same, while the alternative hypothesis suggests that the constants differ. The decision criterion dictates that if the F-test value is below the chosen level of significance, the null hypothesis is rejected, favoring FEM. Conversely, if the F-test value exceeds the significance level, the null hypothesis is accepted, indicating that Pooled OLS is more appropriate.

The Hausman test is commonly used to test the null hypothesis that the individual-specific effects are uncorrelated with the independent variables (Random Effects Model is appropriate) against the alternative hypothesis that there is correlation (Fixed Effects Model is more appropriate). The procedure is to estimate both the Fixed Effects Model (FEM) and the Random Effects Model (REM), calculate the covariance matrix of the difference between the two sets of estimates, and use this covariance matrix to perform a Wald test. The test statistic follows a chi-squared distribution. The decision rule is that if the computed p-value is less than any chosen significance level (i.e 0.05), the null hypothesis is rejected and concludes that FEM is more appropriate, and, if otherwise, this implies that REM is more appropriate (Gujarati and Porter, 2009).

The Breusch-Pagan Lagrange Multiplier (LM) test is employed in Random Effects Models (REM) using the residuals from Ordinary Least Squares (OLS). Its purpose is to aid in choosing between REM and pooled Ordinary Least Squares (OLS) models. The null hypothesis posits that the variance across entities is zero, implying no significant differences among units. The decision criterion involves rejecting the null hypothesis if the p-value of the LM test is less than the chosen level of significance, indicating that REM is more suitable. Conversely, if the p-value is higher, the null hypothesis is accepted, favoring Pooled OLS (Kalita & India, 2013). However, to allow the robustness of the model, the Panel-Corrected Standard Errors (PCSE) is employed in the study's analysis. PCSE accounts for cross-sectional dependence in panel data which can lead to biased estimates in the Fixed Random model.

## 3. PRESENTATION OF RESULTS

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lfindex	792	-1.02815	0.7689547	-2.197243	0.6033209
inst	792	-1.287119	1.44179	-4.127112	1.934323
lgdppc	792	7.152661	0.9521254	5.541656	9.725996
lintr	792	2.375399	0.748673	0.8960881	4.636281
Inf	792	9.834827	30.37339	-8.97474	513.907

Source: Authors' computation, 2024

The descriptive statistics provide an insightful overview of the key variables in the study. From the table above (Table 2), financial development (lfindex) has an average value of -1.02815 with a moderate standard deviation, indicating some variation around the mean and a range from approximately -2.20 to 0.60. Institutional quality (inst) shows a mean of -1.287119 with a relatively high standard deviation of 1.44179, reflecting significant variability across countries, with values ranging from -4.127112 to 1.934323. GDP per capita (lgdppc) has a mean of 7.152661 and a standard deviation of 0.9521254, suggesting moderate variability and a range from 5.541656 to 9.725996. The real interest rate (lintr) has a mean of 2.375399 and a standard deviation of 0.748673, indicating consistent rates across countries, with values spanning from 0.8960881 to 4.636281. Inflation (inf) presents a mean of 9.834827 with an exceptionally high standard deviation of 30.37339, highlighting substantial variability, with values ranging from -8.97474 (deflation) to 513.907 (hyperinflation).

Table 3: Correlation Analysis.

Variable	lfindex	Inst	Lgdppc	lintr	inf
lfindex	1				
inst	-0.0959 (0.0069)	1			
lgdppc	-0.0911 (0.0103)	0.5582 (0.0000)	1		
lintr	0.0393 (0.2694)	0.0709 (0.0461)	-0.1948 (0.0000)	1	
Inf	0.017 (0.6338)	-0.1722 (0.0000)	-0.0485 (0.1723)	0.1882 (0.0000)	1

Source: Authors' computation, 2024.

The correlation results in Table 3 reveal notable relationships among the variables. Financial development (lfindex) has a small but statistically significant negative correlation with institutional quality (inst) and GDP per capita (lgdppc), indicating that as institutional quality and GDP per capita increase, financial development slightly decreases. However, these correlations are weak. Institutional quality has a moderately strong positive correlation with GDP per capita, indicating that countries with better institutional quality tend to have higher GDP per capita, which is highly significant.

The real interest rate (lintr) shows a small positive correlation with institutional quality and a small negative correlation with GDP per capita, suggesting that higher real interest rates are slightly associated with better institutional quality but lower GDP per capita. These correlations are weak, indicating other factors might play a more significant role in determining real interest rates. Inflation (inf) has a weak and insignificant correlation with financial development and GDP per capita, suggesting no strong relationship with these variables. However, it shows a significant negative correlation with institutional quality, indicating that better institutional quality is associated with lower inflation rates. Additionally, inflation has a small positive correlation with the real interest rate, suggesting that higher inflation is slightly associated with higher real interest rates.

Table 4: Unit Root Test Results

Variable	Im-Pesaran-Shin			Levin-Lin-Chu		
	Level	1 <sup>st</sup> Difference	Decision	Level	1 <sup>st</sup> Difference	Decision
lfindex	-8.5671 (0.0000)		I(0)	-15.1251 (0.0000)		I(0)
Inst	-3.5705 (0.0002)		I(0)	-4.6493 (0.0000)		I(0)
lgdppc	0.4034	-13.1725	I(1)	0.2047	-6.7502	I(1)



	(0.6567)	(0.0000)		(0.5811)	(0.0000)
lintr	2.2570	-9.0740	I(1)	-4.0691	I(0)
	(0.9880)	(0.0000)		(0.0000)	
Inf	-5.8175		I(0)	-38.9384	I(0)
	(0.0000)			(0.0000)	

Source: Authors' computation, 2024.

The Im-Pesaran-Shin (IPS) test results in Table 4 indicate that financial development, institutional quality, and inflation are stationary at their levels, meaning they do not require differencing. GDP per capita and the real interest rate are non-stationary at their levels but become stationary after first differencing. These results suggest that financial development, institutional quality, and inflation can be included in their original forms in further analyses, while GDP per capita and the real interest rate need to be differenced. The Levin-Lin-Chu (LLC) test confirms these findings, showing that financial development, institutional quality, the real interest rate, and inflation are stationary at their levels, while GDP per capita requires first differencing. This consistency reinforces the reliability of the stationarity results for subsequent analysis.

Table 5: Regression Results

Variables	Static Model			
	Panel OLS	FEM	REM	PCSE
<b>Inst</b>	-0.0407* [-1.70] (0.090)	-0.116** [-2.13] (0.034)	-0.091** [-1.99] (0.047)	-0.041*** [-2.67] (0.008)
<b>Lgdppc</b>	-0.033 [-0.92] (0.356)	-0.237* [-1.71] (0.087)	-0.077 [-0.86] (0.390)	-0.033 [-1.27] (0.204)
<b>Lintr</b>	0.039 [0.99] (0.323)	0.191*** [3.31] (0.001)	0.187*** [3.55] (0.000)	0.039 [1.08] (0.281)
<b>Inf</b>	-0.0001 [-0.140] (0.887)	0.0004 [0.60] (0.551)	0.0005 [0.73] (0.467)	-0.0001 [-0.17] (0.861)
<b>Constant</b>	-0.931*** [-2.92] (0.004)	0.061 [0.06] (0.954)	-1.045 [-1.46] (0.146)	-0.931*** [-3.48] (0.000)
<b>Total Panel Observation</b>	792	792	792	792
<b>R-square</b>	0.012	0.012	0.011	0.013
<b>F-statistics</b>	3.31*** (0.019)			
<b>F-Test</b>		22.11*** (0.000)		
<b>Wald <math>\chi^2</math>-stat.</b>			25.48*** (0.000)	10.01** (0.040)
<b>Hausman Test</b>		8.02* (0.0910)		
<b>LM Test</b>			1836.9*** (0.000)	
<b>Heteroscedasticity Tests</b>		36392.6*** (0.000)		
<b>Cross-sectional dependency Test</b>			3292.1*** (0.000)	

Source: Authors' computation, 2024.

The Panel OLS model in Table 5 indicates that institutional quality (inst) has a negative and statistically significant effect on financial development (findev) with a coefficient of -0.0407 and a p-value of 0.090. This suggests that a decline in institutional quality leads to reduced financial development. Other variables such as GDP per capita (lgdppc), real interest rate (lintr), and inflation (inf) are

not statistically significant. The R-square value is 0.012, showing that the model explains only 1.2% of the variance in financial development. The overall model significance is confirmed by an F-statistic of 3.31 and a p-value of 0.019.

The Fixed Effect Model (FEM) in Table 5 presents a stronger negative effect of institutional quality on financial development with a coefficient of -0.116 and a p-value of 0.034, indicating that within-country variations over time in poorer institutional quality significantly decrease financial development. GDP per capita has a negative and marginally significant effect with a coefficient of -0.237 and a p-value of 0.087. The real interest rate is positive and highly significant with a coefficient of 0.19 and a p-value of 0.001, suggesting that higher real interest rates correlate with improved financial development. Inflation remains insignificant. The F-test comparing the FEM with the Panel OLS model yields an F value of 22.11 and a p-value of 0.000, suggesting that the FEM is more appropriate due to significant country-specific effects.

The Random Effect Model (REM) in Table 5 also shows a negative and significant impact of institutional quality on financial development with a coefficient of -0.091 and a p-value of 0.047. Similar to the FEM, the real interest rate is positive and highly significant. GDP per capita and inflation are not significant. The Hausman test comparing FEM and REM results yields a Chi-square value of 8.02 with a p-value of 0.0910, suggesting that the FEM might be more appropriate, though the evidence is not overwhelming. Therefore, there is a slight preference for the FEM due to potential concerns about the consistency of the REM estimator.

The cross-sectional dependency test result in Table 5 reveals a significant statistic ( $\chi^2 = 3292.1$ ,  $p = 0.000$ ), indicating the presence of cross-sectional dependence in the model. This implies that unobserved common factors are influencing the countries in the sample, violating the assumption of independence across cross-sections. To address this, the PCSE model is used. The PCSE model results show a significant negative impact of institutional quality on financial development with a coefficient of -0.041 and a p-value of 0.008, consistent with previous models. GDP per capita, real interest rate, and inflation are not significant in the PCSE model. The consistent negative coefficient for institutional quality across all models highlights its critical role in influencing financial development. The PCSE model accounts for cross-sectional dependence and heteroscedasticity, providing more reliable standard errors and confidence in the significance of the results.

**Table 6: Dumitrescu-Hurlin Granger non-causality**

No	Null Hypothesis ( $H_0$ )	w-stat.	p-value	Decision	Type and Direction of Causality
1	Inst does not granger cause Findev		0.0000**		
2	FINDEV does not granger cause Inst		*		
		2.4163	0.2671**	Reject $H_0$	Uni-directional Causality: Inst $\Rightarrow$ Findev
		1.2616	*	Accept $H_0$	

Source: Authors' computation, 2024.

The Dumitrescu and Hurlin Granger non-causality test results in Table 6 provide insights into the causal relationships between institutional quality (inst) and financial development (findev) in sub-Saharan African countries. The null hypothesis that institutional quality does not homogeneously cause financial development is rejected, with a w-statistic of 2.4163 and a highly significant p-value of 0.0000. This indicates a unidirectional causality where changes in institutional quality predict changes in financial development. Conversely, the null hypothesis that financial development does not homogeneously cause institutional quality cannot be rejected, as the w-statistic of 1.2616 and a p-value of 0.2671 are not statistically significant. Thus, the test confirms that while institutional quality Granger causes financial development, the reverse is not true, highlighting the pivotal role of improving institutional frameworks to foster financial development in these countries.

#### 4. DISCUSSION OF THE RESULTS

The study investigates the influence of institutional quality on financial development in sub-Saharan Africa, using various econometric models to ensure robustness and address methodological issues. The analysis begins with the Panel OLS model, which finds a negative and statistically significant effect of institutional quality on financial development, consistent with previous studies by Olarinde & Yahya (2018), Fhima (2018), and Nkoa et al (2023). Other variables like GDP per capita, real interest rate, and inflation are not statistically significant in this model.

The Fixed Effect Model (FEM) reveals an even more pronounced negative impact of institutional quality on financial development, accounting for within-country variations over time. The FEM shows a negative and marginally significant effect of GDP per capita and a positive significant impact of the real interest rate on financial development, while inflation remains insignificant. The Random Effect Model (REM) also finds a negative and significant relationship between institutional quality and financial development, similar to the FEM. The Hausman test suggests a slight preference for the FEM due to potential consistency concerns with the REM. Addressing cross-sectional dependence, indicated by the cross-sectional dependency test, the study employs the Panel-Corrected Standard Errors (PCSE) model. This model adjusts for unobserved common factors, providing more reliable standard errors, and confirming the negative impact of institutional quality on financial development. The Dumitrescu and Hurlin Granger non-causality

test reveals a unidirectional causality from institutional quality to financial development, emphasizing the importance of improving institutional frameworks to foster financial development in sub-Saharan Africa. The consistent findings across different models highlight the critical role of institutional quality in enhancing financial development in the region, reinforcing the study's conclusion.

## 5. CONCLUSION AND RECOMMENDATIONS

This study examines the influence of institutional quality on financial development in sub-Saharan Africa, using various econometric models to ensure robustness and address methodological concerns. The findings consistently show that poor institutional quality adversely affects financial development in the region, aligning with previous research. The Fixed Effect Model (FEM) indicates a significant negative impact, suggesting that variations in institutional quality within countries critically influence financial development. The Random Effect Model (REM) and the Panel-Corrected Standard Errors (PCSE) model support these results, emphasizing the importance of institutional quality. The Dumitrescu and Hurlin Granger non-causality test reveals a unidirectional causality from institutional quality to financial development, highlighting the necessity of strong institutional frameworks. The study concludes that improving institutional quality is crucial for enhancing financial development in sub-Saharan Africa. Governments and policymakers should prioritize reforms to strengthen institutional quality, including better governance, rule of law, anti-corruption measures, and efficient government operations. Regional cooperation and knowledge sharing can help implement best practices in institutional reforms. Policies should focus on long-term institutional development for sustainable financial growth, and investing in capacity building for public officials and institutions is essential.

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