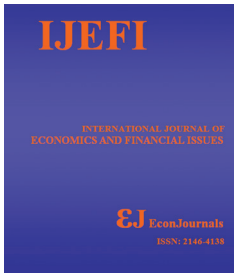

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# Institutional Quality and Economic Growth in Africa: The Moderating Role of Financial Inclusion and Literacy

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**ABSTRACT**

Correlation between institutional quality and economic growth in Africa, with particular emphasis on the moderating influences of financial inclusion and literacy was examined to investigate the degree to which financial inclusion and literacy contribute to the efficacy of institutional quality in promoting economic development. The research encompasses a total of 42 African nations, covering the timeframe from 2003 to 2024, and offers an extensive examination of the interrelations among these significant variables. The research employs panel data obtained from esteemed international databases, such as the World Bank and various regional economic reports, thereby ensuring the reliability and robustness of the results. To conduct the analysis of the data, dynamic panel estimation techniques are utilized, particularly the System Generalized Method of Moments (GMM). This approach effectively resolves endogeneity concerns and encapsulates the dynamic characteristics of economic growth. The findings indicate that institutional quality exerts a substantial influence on economic growth; however, this effect is magnified when it is associated with elevated levels of financial inclusion and literacy. These findings emphasize the significance of implementing a multi-faceted approach to development, which combines institutional reforms with initiatives aimed at improving financial inclusion and educational outcomes. This research enhances the existing body of literature by presenting empirical evidence regarding the interactive effects of institutional quality, financial inclusion, and literacy. It offers significant insights for policymakers and development practitioners operating within the African context.

**Keywords:** Institutional Quality, Economic Growth, Financial Inclusion, Literacy, Governance
**JEL Classifications:** O43, O55, G21, I25, E02, F43

## 1. INTRODUCTION

Economic growth in Africa has garnered considerable attention within academic circles, with a multitude of studies endeavoring to ascertain the fundamental factors that contribute to sustained economic performance throughout the continent. Among these determinants, the caliber of institutions has emerged as a pivotal factor. Institutions, characterized as the formal and informal regulations that dictate economic, political, and social interactions, are pivotal in influencing the economic trajectory of nations (Strangio, 2025; Dai et al., 2025). Robust and effective institutions facilitate the enforcement of contracts, safeguard property rights, and uphold law and order, thereby cultivating an environment that is conducive to economic activities. In contrast, fragile institutions, marked by corruption, inefficiency, and inadequate governance, impede economic advancement by eroding trust and dissuading investment (Osuma et al., 2024; Al Qudah, 2024). The institutional topography of Africa is characterized by considerable diversity, marked by significant variations in governance, legal frameworks, and administrative efficacy (Ghalehteimouri, 2024). This complexity renders the continent an exemplary setting for examining the correlation between institutional quality and economic growth.

Notwithstanding the acknowledgement of institutional quality as a critical factor influencing economic performance, the continent continues to confront challenges that hinder its development potential (Babatunde and Afolabi, 2024). Structural inefficiencies,

political instability, and corruption are widespread challenges that undermine institutional efficacy and limit economic prospects. Although certain African nations have achieved significant advancements in enhancing governance and institutional frameworks, others continue to be entrenched in cycles of inadequate governance and suboptimal economic performance (Adams, 2024). Consequently, comprehending the impact of institutional quality on economic development in Africa is not only essential but also opportune, considering the pressing necessity to realize the continent's economic potential (Duodu and Kwarteng, 2025). Nevertheless, the relationship between institutional quality and economic growth is intricate and shaped by a multitude of mediating and moderating factors, including financial inclusion and financial literacy, which may either enhance or diminish this relationship.

Financial inclusion, characterized by the availability of financial services to all segments of society, serves as a crucial facilitator of economic development. By granting individuals and enterprises access to credit, savings, and insurance, financial inclusion fosters entrepreneurial endeavors, improves domestic well-being, and promotes capital accumulation (Liu et al., 2024). In Africa, financial inclusion has garnered significant attention as a mechanism for fostering economic development and alleviating poverty. Nevertheless, considerable disparities in access to financial services persist, with rural populations, women, and low-income households frequently marginalized from formal financial systems (Sikka and Bhayana, 2024). The character of institutions is fundamental in promoting financial inclusion, as robust institutions establish the regulatory frameworks and policies essential for ensuring that financial services are accessible, affordable, and equitable. Moreover, financial literacy, defined as the capacity to comprehend and proficiently utilize financial concepts and instruments, enhances financial inclusion by equipping individuals to make informed financial choices (Shi et al., 2025; Njoki, 2024).

The interaction among institutional quality, financial inclusion, and financial literacy is of paramount significance within the African context, where substantial portions of the population continue to be either unbanked or under banked (Bello, 2024). Inadequate institutional frameworks exacerbate financial exclusion, as insufficient regulatory supervision and inefficiencies within financial systems deter participation (Butler and Brooks, 2024). In a similar vein, insufficient levels of financial literacy hinder effective engagement with financial services, thereby diminishing their capacity to foster economic growth. When financial literacy is elevated, individuals are more adept at maneuvering through financial systems, obtaining credit, and participating in economic activities that foster development (Challoumis and Eriotis, 2024). In contrast, the absence of financial literacy may result in financial negligence and exacerbate existing inequalities, thereby underscoring the necessity of incorporating financial literacy initiatives into comprehensive development strategies.

In recent years, the increasing acknowledgement of financial inclusion and literacy as pivotal catalysts for economic development has prompted policy initiatives designed to bolster these elements throughout the continent (Nambie et al., 2024). Initiatives such as mobile banking and digital financial services have significantly enhanced access to financial systems, particularly in underserved areas. Nonetheless, the efficacy of these initiatives frequently depends on the caliber of the institutions involved. For example, digital financial systems necessitate the establishment of comprehensive regulatory frameworks to guarantee security and mitigate the risk of fraud. In a similar vein, financial literacy initiatives yield the greatest impact when underpinned by policies that foster equitable access to educational opportunities and financial resources (Putrevu and Mertzanis, 2024).

Considering the interrelationship among institutional quality, financial inclusion, and financial literacy, it is imperative to further investigate their combined influence on economic growth. The diverse institutional frameworks across Africa, coupled with differing degrees of financial inclusion and literacy, present a distinctive opportunity to analyze the interplay of these elements and their impact on economic performance. This study seeks to elucidate the mechanisms by which inclusive and informed financial systems can augment the growth potential of African economies by examining the moderating effects of financial inclusion and literacy on the relationship between institutional quality and economic development.

Notwithstanding considerable endeavors to promote economic growth in Africa, the continent continues to grapple with enduring challenges, including poverty, inequality, and underdevelopment (Zhou, 2022). An expanding corpus of literature has underscored the pivotal significance of institutional quality in influencing economic performance (Olawale and Obinna, 2023). Robust institutions that foster effective governance, safeguard property rights, and uphold the rule of law are broadly acknowledged as pivotal drivers of economic development (Bhagat and Hubbard, 2022). Nevertheless, in numerous African nations, inadequate institutional frameworks have impeded the achievement of sustained economic growth (Kouadio and Gakpa, 2022). Although prior research has thoroughly investigated the direct correlation between institutional quality and economic growth, the moderating factors that may amplify or diminish this relationship have not been sufficiently examined, especially within the African context.

A notable deficiency in the current literature is the inadequate emphasis on financial inclusion and financial literacy as moderating variables. Financial inclusion has been recognized as a pivotal catalyst for economic growth, as it enhances access to credit, savings, and financial services, thereby empowering both individuals and enterprises (Lal, 2021). Likewise, financial literacy augments individuals' capacity to make informed financial decisions, thereby optimizing the advantages associated with financial (Adeoye et al., 2024). Nevertheless, the interaction between institutional quality, financial inclusion, and financial literacy remains largely unexamined, resulting in a significant void in comprehending how these elements collectively impact economic outcomes in Africa.

This study aims to bridge this divide by examining the extent to which financial inclusion and literacy serve as moderating factors in the relationship between institutional quality and economic

growth. The originality of this research is rooted in its integrative methodology, which amalgamates institutional economics with perspectives derived from studies on financial inclusion and literacy, thereby offering a thorough analysis. By concentrating on Africa, where disparities in institutional quality and access to financial systems are especially significant, this study enhances the sparse empirical evidence regarding the contextual factors that influence the efficacy of institutional frameworks. This investigation is crucial for formulating targeted policies that not only enhance institutional frameworks but also utilize financial inclusion and literacy to realize the continent's development potential.

This study is organized into five detailed sections to systematically resolve the research problem, the initial section presents an introduction that delineates the background, articulates the problem statement, outlines the objectives, and underscores the significance of the study. The text establishes the context by examining the significance of institutional quality and economic growth in Africa, while emphasizing the potential moderating influences of financial inclusion and literacy. The second section offers a comprehensive review of pertinent literature, utilizing theoretical frameworks and empirical evidence pertaining to institutional quality, economic growth, financial inclusion, and financial literacy. This section delineates the deficiencies within the current corpus of knowledge and establishes the conceptual framework that underpins the study. The third section delineates the methodology utilized in the research, providing a comprehensive account of the data sources, sample selection criteria, and analytical techniques employed to examine the interrelationships among institutional quality, economic development, financial inclusion, and literacy. It further elucidates the rationale behind the selection of methodologies and delineates the approach concerning the moderating effect. The fourth section is dedicated to the presentation and analysis of the results, providing valuable insights into the study's findings. The discourse examines the ramifications of the moderating influences of financial inclusion and literacy on the correlation between institutional quality and economic growth, with a specific focus on the African context. The concluding section presents a synthesis of the findings, draws conclusions, and offers recommendations, the document elucidates the study's contributions to the field, examines the implications for policy, and proposes avenues for further research aimed at enhancing comprehension and promoting improved economic outcomes in Africa. This organization guarantees a coherent progression of information and thoroughly addresses the research objectives.

## 2. LITERATURE REVIEW

Classical growth theory offers a fundamental framework for comprehending the interplay between institutional quality and economic development in Africa, especially when taking into account the moderating influences of financial inclusion and literacy (Fiaschi and Signorino, 2003). Grounded in the contributions of economists such as Adam Smith, David Ricardo, and Thomas Malthus, this theory underscores the significance of production factors, market efficiency, and institutional stability in promoting economic development (Kishimoto, 1950). Within the African context, these principles may be employed to analyze the extent to which resilient institutions and effective systems foster sustained economic growth, while the functions of financial inclusion and literacy serve to enhance these outcomes. At the core of classical growth theory lies the notion that economic development is generated through labor specialization, optimal resource allocation, and the dynamic interaction of supply and demand within open markets. Adam Smith's notion of the invisible hand posits that when markets function autonomously within robust institutional frameworks, resources are allocated with optimal efficiency, resulting in enhanced productivity (Dawkins, 2003). In Africa, the character of institutions is fundamental in establishing the requisite conditions for achieving market efficiency (North, 1995). Institutions that safeguard property rights, enforce contractual agreements, and promote transparency mitigate uncertainty and lower transaction costs, thereby fostering investment and innovation. In contrast, institutions that are feeble and characterized by corruption, inadequate governance, and inefficiency impede economic advancement by elevating risks for investors and suppressing entrepreneurial endeavors (North, 1995).

Within this theoretical framework, financial inclusion is identified as a pivotal moderating variable. Classical growth theory recognizes the significance of capital in the process of economic expansion, underscoring that investment is essential for enhancing production capacity. Financial inclusion guarantees that individuals and enterprises have access to financial services, thereby facilitating the accumulation of capital essential for investment (Shofawati, 2019). In Africa, where a considerable segment of the population is unbanked, restricted access to credit and deposits impedes economic activities and diminishes overall productivity (Adelaja et al., 2024). By broadening access to financial services, financial inclusion enhances the mobilization of savings and directs them towards productive investments, thereby aligning with the traditional focus on capital accumulation as a catalyst for economic development. In a similar vein, literacy serves as a moderating factor in the relationship between institutional quality and economic development by augmenting labor productivity, which is a fundamental element of classical growth theory. Literacy equips individuals with the necessary skills and knowledge, thereby enhancing their capacity to contribute effectively to the production process (Eshet, 2004; Sørensen et al., 2012). In African economies, where deficiencies in education and skills frequently hinder workforce productivity, enhancing literacy levels can result in substantial economic benefits. Furthermore, literacy equips individuals with the ability to navigate financial systems, access information, and engage in governance processes, thereby enhancing both financial inclusion and the efficacy of institutions. The interplay of these factors enhances the beneficial effect of institutional quality on economic growth (Johnston and Mellor, 1961).

David Ricardo's theory of comparative advantage further emphasizes the significance of institutional quality in facilitating effective specialization and trade among economies (Siddiqui, 2018; Costinot, 2009). Institutions that promote open markets, safeguard intellectual property rights, and facilitate international trade enable African nations to capitalize on their comparative

advantages in natural resources, agriculture, and burgeoning industries. Nonetheless, the advantages of such specialization are dependent upon the presence of inclusive financial systems and a population that possesses financial literacy (Hampton and Christensen, 2002). In the absence of these moderating factors, the potential for economic growth derived from comparative advantage remains inadequately harnessed (Efrat et al., 2018). In conclusion, classical growth theory offers a comprehensive framework for analyzing the interplay between institutional quality and economic development in Africa. By underscoring the fundamental importance of robust institutions in promoting market efficiency and productivity, the theory elucidates how financial inclusion and literacy can amplify these effects (Abdulahi et al., 2019). Financial inclusion facilitates the mobilization of capital and encourages investment, whereas literacy improves labor productivity and fosters participation in economic and governance activities, collectively, these factors establish a synergistic relationship capable of fostering sustained economic growth throughout the continent, effectively addressing numerous structural challenges that have historically hindered Africa's development (Cohen and Nelson, 2011).

The quality of institutions has been the subject of extensive research as a pivotal factor influencing economic development across various regions, especially within developing economies in Africa. In recent years, the discourse surrounding the impact of institutional frameworks on economic growth has been further enriched by research examining the roles of financial inclusion and literacy as potential moderating factors. Comprehending this dynamic is crucial for formulating policies that effectively tackle Africa's distinctive economic challenges, which frequently encompass fragile institutions, insufficient financial literacy, and restricted access to financial services.

Muldoon et al. (2024) characterized institutions as the rules, norms, and constraints that delineate the framework for economic, political, and social interactions, institutions of superior quality, distinguished by the rule of law, the safeguarding of property rights, and efficient governance, foster an environment that is conducive to economic development by mitigating transaction costs and uncertainties. Kafouros et al. (2024) underscored the pivotal role of institutional quality in shaping economic performance, they contended that nations characterized by inclusive institutions—those that ensure equitable opportunities and uphold property rights are more likely to achieve elevated levels of economic growth. In the African context, institutions frequently grapple with issues of corruption, inefficiency, and inadequate enforcement mechanisms, which significantly impede their capacity to foster economic growth.

For instance, Zaïbi et al. (2024) illustrated that political instability, indicative of fragile institutions, exerts a substantial adverse effect on economic growth within African nations. Financial inclusion has become a crucial element in augmenting the advantages associated with institutional quality. The concept pertains to the availability of financial services, encompassing credit, savings, and insurance, to populations that are underserved. Empirical research indicates that financial inclusion promotes economic growth by enhancing investment levels, stabilizing consumption patterns, and mitigating income inequality (Chowdhury and Chowdhury, 2024). Somuncu (2025) established a robust correlation between financial development and economic growth, particularly within the context of developing nations. In Africa, where a significant segment of the population remains unbanked, financial inclusion has the potential to effectuate transformative change. Ochuba et al. (2024) emphasized that access to financial services not only empowers individuals but also augments the efficacy of institutional frameworks by facilitating economic transactions and investments. Furthermore, financial inclusion serves to alleviate the risks linked to inadequate institutional frameworks by offering alternative mechanisms for the allocation of resources and the management of risk.

Financial literacy significantly enhances the correlation between institutional quality and economic growth by fostering improved decision-making at both the individual and collective levels. Ayandibu and Ayandibu (2024) contended that financial literacy provides individuals with the requisite knowledge and skills to make informed financial decisions, consequently improving their savings, investments, and entrepreneurial endeavors. In Africa, where levels of financial literacy are notably deficient, the insufficient awareness and comprehension of financial products frequently constrains the effectiveness of financial inclusion initiatives. Nchise and Akosso (2024) discovered that there exists a positive correlation between financial literacy and the utilization of formal financial services in Sub-Saharan Africa. This suggests that, despite the existence of financial inclusion, a deficiency in financial literacy may impede economic growth by restricting the effective deployment of financial resources.

Empirical studies have also investigated the interplay among institutional quality, financial inclusion, and literacy, analyzing their combined effects on economic growth. For example, Prabhakar (2025) posited that financial inclusion serves as a conduit through which institutional quality is transformed into economic growth. The research, which incorporated data from developing nations, revealed that countries exhibiting superior institutional quality and elevated levels of financial inclusion tend to experience more vigorous economic growth. In a similar vein, Kiran et al. (2025) underscored the significance of financial literacy as a moderating factor, positing that its presence amplifies the capacity of financial inclusion to yield favorable economic results.

Notwithstanding the considerable progress made in comprehending these dynamics, there persist notable deficiencies in the empirical literature, especially with regard to Africa. A significant portion of the current research is either focused on a global scale or is specific to particular regions, with insufficient emphasis on the interplay between financial inclusion, financial literacy, and institutional quality in influencing economic growth in Africa. Furthermore, research frequently neglects to consider the heterogeneity present within African nations, where differing degrees of institutional development, financial inclusion, and literacy levels complicate the applicability of findings across the board. Research conducted by Li et al. (2024) elucidated that, although financial inclusion exerts a beneficial influence on economic growth in Africa, this effect

is contingent upon institutional factors, thereby emphasizing the necessity for a nuanced approach.

This study aims to bridge these gaps by investigating the moderating effects of financial inclusion and literacy on the relationship between institutional quality and economic growth in Africa. By concentrating on the continent, it facilitates a more profound comprehension of the interplay among these factors within contexts marked by institutional fragility and socio-economic inequalities. The results will offer significant insights for policymakers seeking to formulate interventions that utilize financial inclusion and literacy to improve institutional quality and promote economic growth.

## 3. DATA AND METHODOLOGY

The study employs a quantitative research design to examine the relationship between institutional quality and economic growth in Africa, with particular emphasis on the moderating effects of financial inclusion and literacy. The selection of a quantitative methodology is suitable for delineating measurable relationships among variables and for guaranteeing the rigor and objectivity of the analysis. The data utilized for this study are derived from the World Development Indicators (WDI), a widely acknowledged and reputable database that offers comprehensive information on economic, social, and institutional variables. The dataset encompasses the period from 2003 to 2024, documenting significant trends and transformations over two decades. This information is vital for comprehending long-term patterns and dynamics pertaining to institutional quality and economic development across African nations.

Principal component analysis (PCA) is utilized to develop composite indices for institutional quality, financial inclusion, and literacy. Principal component analysis (PCA) is especially adept at dimensionality reduction in datasets characterized by numerous interrelated variables, thereby ensuring that the most salient components are preserved for subsequent analysis. This methodological selection augments the robustness of the findings by offering a nuanced depiction of intricate constructs. The study encompasses all 54 African nations with the aim of providing an extensive comprehension of the continent's varied economic and institutional frameworks. The choice of the world development indicators (WDI) as the principal data source is driven by its reliability, extensive scope, and widespread recognition as a standard reference for indicators pertinent to development. The selection of data is congruent with the study's objectives, which aim to investigate the interactions among institutional quality, financial inclusion, literacy, and economic growth, while also considering regional disparities and the implications for policy.

### 3.1. Estimation Technique

The generalized method of moments (GMM) has been employed as the estimation technique to examine the relationship between institutional quality and economic growth in Africa, with particular emphasis on the moderating influences of financial inclusion and literacy. The generalized method of moments (GMM), first introduced by Hansen (1985) is a versatile and resilient technique particularly well-equipped to tackle endogeneity concerns, which frequently arise in econometric analyses involving institutional and economic variables. Endogeneity occurs when explanatory variables exhibit correlation with the error term, which may be attributable to reverse causality, omitted variable bias, or measurement errors. The GMM approach helps to mitigate these issues by employing internal instruments derived from the lagged values of explanatory variables (Arellano and Bond, 1991). In this investigation, the GMM approach is particularly advantageous given the panel nature of the data, encompassing 54 African countries over the period from 2003 to 2024. This method is well-suited for dynamic panel models that include lagged dependent variables as regressors. By allowing these lagged values to function as instruments, GMM addresses autocorrelation and captures the dynamic effects of institutional quality on economic growth. Moreover, the methodology incorporates unobserved country-specific effects, including cultural or historical factors, which remain constant over time and could potentially distort the estimates (Blundell and Bond, 1998).

The GMM framework also facilitates the inclusion of interaction terms, enabling the study to investigate the moderating functions of financial inclusion and literacy. Through the interaction of these moderating variables with indicators of institutional quality, the analysis investigates how fluctuations in financial inclusion and literacy levels affect the influence of institutional quality on economic outcomes. This is crucial for elucidating the mechanisms by which financial and educational dimensions interact with governance frameworks to influence economic performance.

Another significant advantage of the generalized method of moments (GMM) technique lies in its appropriateness for managing datasets characterized by a greater number of cross-sectional units (such as countries) than temporal observations (such as years). Considering the comparatively brief time frame and the extensive number of countries encompassed in the dataset, the generalized method of moments (GMM) approach guarantees both consistent and efficient estimation of parameters. Diagnostic assessments, including the Hansen J-test for over-identification and the Arellano-Bond test for serial correlation, serve as robustness checks to authenticate the instruments and ensure the dependability of the estimates. By leveraging GMM, this study not only overcomes methodological challenges but also provides nuanced insights into the interplay between institutional quality, financial inclusion, literacy, and economic growth in Africa. The outcomes generated from this methodology are anticipated to be resilient and pivotal in guiding policy interventions designed to promote sustainable economic development within the region.

### 3.2. Econometric Model

The econometric model designed to examine the correlation between institutional quality and economic growth in Africa, while taking into account the moderating influences of financial inclusion and literacy, can be articulated as follows:

#### *3.2.1. Specification of the model*

In order to develop a generalized method of moments (GMM) panel data model for the examination of the interrelationships

among Institutional Quality, Economic Growth, Financial Inclusion, and Financial Literacy in Africa, we will sequentially designate each variable as the dependent variable. Generalized method of moments (GMM) is well-suited for addressing issues related to endogeneity, unobserved heterogeneity, and the characteristics inherent in dynamic panel data. The generic form of a panel data model using system GMM is formulated as follow:

$$Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \lambda_i + \delta_t + \epsilon_{i,t} \quad (1)$$

Where $Y_{i,t}$ is dependent variable for country $i$ at time $t$, $X_{i,t}$ represents independent variables for country $i$ at time $t$, $\lambda_i$ denotes country-specific fixed or random effect, $\delta_t$ is time-specific fixed or random effect, $\epsilon_{i,t}$ is idiosyncratic error term.

Economic growth (*Econs*) is modeled as a function of institutional quality (*Institutions*), financial inclusion (*Financial*), financial literacy (*Literacy*), their interactions, and lagged economic growth. The coefficients of the models are $\alpha_0$ to $\alpha_7$, $\beta_0$ to $\beta_0$, $\gamma_0$ to $\gamma_6$, and $\delta_0$ to $\delta_6$.

$$Econs_{i,t} = \alpha_0 + \alpha_1 Econs_{i,t-1}) + \alpha_2 Institution_{i,t} + \alpha_3 Financial_{i,t} + \alpha_4 Literacy_{i,t} + \alpha_5 Institution_{i,t} * Financial_{i,t} + \alpha_6 Institution_{i,t} * Literacyi,t + \alpha 7 X_{i,t} + \epsilon_{i,t} \quad (2)$$

where $\alpha_1 Econs_{i,t-1}$: Lagged economic growth (to capture dynamic effects), $X_{i,t}$: Control variables, $\epsilon_{i,t}$ is error term.

Institutional quality (*Institutions*) depends on economic growth, financial inclusion, financial literacy, their interactions, and lagged institutional quality:

$$Institution_{i,t} = \beta_0 + \beta_1 Institution_{i,t-1} + \beta_2 Econs_{i,t} + \beta_3 Financial_{i,t} + \beta_4 Literacy_{i,t} + \beta_5 Financial_{i,t} * Literacy_{i,t} + \beta_6 Z_{i,t} + v_{i,t} \quad (3)$$

where $Institution_{i,t-1}$ is the Lagged institutional quality, $Z_{i,t}$ is the Socio-political control variables $v_{i,t}$ is the Error term.

Financial inclusion (*F1*) is a function of institutional quality, economic growth, financial literacy, their interactions, and lagged financial inclusion:

$$Financial_{i,t} = \gamma_0 + \gamma_1 Financial_{i,t-1} + \gamma_2 Institutions_{i,t} + \gamma_3 Econs_{i,t} + \gamma_4 Literacy_{i,t} + \gamma_5 Institutions_{i,t} * Literacy_{i,t} + \gamma_6 W_{i,t} + \eta_{i,t} \quad (4)$$

where $Financial_{i,t-1}$: Lagged financial inclusion, $W_{i,t}$ represents the control variables in the model, $\eta_{i,t}$: Error term.

Financial literacy (*Literacy*) depends on institutional quality, economic growth, financial inclusion, their interactions, and lagged financial literacy

$$Literacy_{i,t} = \delta_0 + \delta_1 Literacy_{i,t-1} + \delta_2 Institutions_{i,t} + \delta_3 Econs_{i,t} + \delta_4 Financial_{i,t} + \delta_5 Fianacial_{i,t} * Institutions_{i,t} + \delta_6 V_{i,t} + \zeta_{i,t} \quad (5)$$

Where $Literacy_{i,t-1}$: Lagged financial literacy, $V_{i,t}$ represents the control variables in the model and $\zeta_{i,t}$ is the error term.

### *3.2.2. Variables definitions and measurements*

A comprehensive summary of the primary variables employed in this study, including their respective notations, measurement metrics, and data sources, is presented in Table 1. The variables were chosen to reflect the multifaceted factors that influence economic outcomes and financial inclusion, such as institutional quality, technological access, demographic dynamics, and macroeconomic performance. Consistency, reliability, and cross-country comparability are guaranteed by the operationalization of each variable using internationally recognized indicators. Data encompasses both economic and socio-institutional dimensions are derived from sources such as the world development indicators (WDI) of the World Bank, the international monetary fund (IMF), the Global Findex Database, and the International Telecommunication Union (ITU). This table functions as a fundamental reference for the empirical analysis that follows, thereby bolstering the transparency and robustness of the research methodology.

## 4. ANALYSES AND DISCUSSION OF RESULTS

Analyses and discussion of results constitute an essential element of any empirical study, offering valuable insights into the interrelationships among principal variables and elucidating their implications. This section generally commences with the presentation of descriptive statistics, which provide a comprehensive summary of the central tendencies and variability of the data, along with preliminary insights into the distribution of the variables being examined. Subsequently, the results of the econometric estimations are delineated, with particular emphasis placed on the significance and directionality of the principal relationships. This study aims to elucidate the interactions among institutional quality, economic growth, financial inclusion, and financial literacy within the African context. The analysis assesses the dynamic interactions among these variables while addressing potential endogeneity through the application of robust econometric methodologies, including the Generalized Method of Moments (GMM). The discourse elucidates the direct impact of institutional quality on economic growth, the moderating influences of financial inclusion and literacy, as well as the contributions of control variables, including total capital formation, government expenditure, and trade openness. Moreover, this section elucidates the statistical significance and practical implications of the findings, situating them within the wider framework of the existing literature. The discourse further examines the robustness of the findings by evaluating alternative model specifications and conducting diagnostic tests, thereby ensuring that the conclusions drawn are credible and thoroughly substantiated. Ultimately, the ramifications of the findings for policy and development in Africa are examined, accompanied by recommendations aimed at enhancing institutional frameworks and fostering financial inclusion and literacy to ensure the sustainability of economic growth.

Table 2 shows descriptive statistics indicating a comprehensive summary of the variables employed in the study, elucidating

**Table 1: Variables definitions, measurements, and source of data**

| Name of variable | Notation | Measurement/definition | Source of data |
|---|---|---|---|
| Economic growth | Econs | Annual percentage growth rate of GDP at market prices based on constant local currency. | World bank (World Development Indicators - WDI) |
| Institutional quality | Institution | Composite index based on governance indicators like rule of law, corruption control, and government effectiveness. | Worldwide governance indicators (WGI), transparency international |
| Financial inclusion | Financial | Percentage of adults with access to a bank account, mobile money account, or formal financial services. | Global findex database (World Bank), IMF Financial Access Survey |
| Financial literacy | literacy | Percentage of adults demonstrating basic knowledge of financial concepts such as interest, inflation, and risk diversification. | Global findex database, OECD/INFE Surveys |
| Gross capital formation | GCF | Gross fixed capital formation as a percentage of GDP. | World bank (WDI) |
| Government expenditure | GE | General government final consumption expenditure as a percentage of GDP. | World bank (WDI), IMF |
| Population growth | Population | Annual percentage change in the total population. | World bank (WDI), United Nations population division |
| ICT penetration | ICT | Internet users (percentage of population) and mobile subscriptions per 100 people. | International telecommunication union (ITU), World bank |
| Trade openness | Trade | Sum of exports and imports as a percentage of GDP. | World bank (WDI), UNCTAD |
| Foreign direct investment | FDI | Net inflows of FDI as a percentage of GDP. | World bank (WDI), UNCTAD |
| Age distribution | Age | Percentage of the population in specific age groups (e.g., 15-64 years, above 65 years). | World bank (WDI), United nations population division |
| Technological access | Tech | Proportion of the population with access to computers, smartphones, or digital services. | International telecommunication union (ITU), GSMA Mobile economy report |

Author's compilations (2025)

**Table 2: Descriptive statistics**

| Variable | Obs | Mean | Standard deviation | Min | Max |
|---|---|---|---|---|---|
| Econs | 420 | 31.415 | 24.285 | 0.117 | 132.83 |
| Institutions | 420 | 72.832 | 31.957 | 0.065 | 140.68 |
| Financial | 420 | 77.999 | 33.646 | 0.351 | 160.19 |
| Literacy | 420 | 44.876 | 50.277 | 0.012 | 221.18 |
| GCF | 420 | 20.248 | 22.626 | −3.36 | 98.14 |
| GE | 420 | 54.945 | 39.013 | 0.176 | 173.48 |
| Population | 420 | 0.288 | 0.172 | 0.044 | 0.719 |
| ICT | 420 | 45.526 | 20.909 | 0.231 | 117.21 |
| Trade | 420 | 0.262 | 0.157 | 0.048 | 0.611 |
| FDI | 420 | 0.24 | 0.164 | 0.012 | 0.662 |
| AGE | 420 | 0.811 | 0.968 | 0.035 | 3.37 |
| Tech | 420 | 2.091 | 0.559 | 1.34 | 3.29 |

Author's Computation (2025)

their distribution and range. The descriptive statistics offer a comprehensive summary of the principal variables within the dataset, emphasizing their central tendencies and measures of dispersion. Economic growth demonstrates a moderate average, characterized by significant variability, as evidenced by the standard deviation, and encompasses a broad spectrum between its minimum and maximum values. The mean of institutional quality is comparatively elevated, indicating robust governance structures in certain instances; however, the standard deviation reveals considerable variability among the observations. Financial inclusion exhibits a significant mean value, accompanied by a considerable variance, which underscores the disparities in access to financial services. Financial literacy exhibits the greatest degree of variability, as its utmost value substantially surpasses the mean. This indicates a pronounced disparity among various observations regarding financial knowledge and awareness. Gross capital formation exhibits moderate fluctuations, with certain occurrences of negative values, signifying sporadic disinvestment within the sample. Government expenditure exhibits a relatively elevated mean accompanied by a significant variance, indicating disparities in fiscal policies among the observed instances. Population growth demonstrates a relatively low degree of variability, with values concentrated within a limited range. The development of information and communication technology (ICT) exhibits a moderate average; however, it reveals considerable variability, indicating disparities in digital infrastructure and the adoption of technology. Trade openness exhibits a relatively stable pattern, characterized by a narrower range of values, whereas foreign direct investment demonstrates a marginally greater degree of variability. The age variable exhibits moderate dispersion, indicating a degree of heterogeneity within the demographic composition. Technological advancement exhibits the least variability among all variables, signifying a comparatively consistent level of technological progress throughout the sample. In summary, the descriptive statistics elucidate the economic, institutional, and financial disparities inherent within the dataset, thereby reflecting the varied socio-economic conditions represented in the observations.

Economic growth, institutional quality, financial development, literacy, investment, governance, population, ICT, trade, foreign direct investment, age, and technology are all interconnected, as the correlation matrix illustrates in Table 3. Investment, technology, and governance are all strongly correlated with economic growth, indicating their substantial impact. There is a considerable correlation between financial development and institutional quality, and there is also a strong correlation between investment and literacy. Trade and governance exhibit a significant link that reflects their mutual reliance. While the population has weak direct influence, ICT has weaker correlations with the majority of variables. In general, the matrix indicates that technological development, investment, and governance are important determinants of economic performance, whereas population and ICT have a weak significant effect.

Table 4 show results obtained from the Generalized Method of Moments (GMM) estimation offering valuable insights into the impact of institutional quality, financial inclusion, financial literacy, and technology on economic growth within the African context. The findings indicate that economic transformation exerts a substantial influence on institutional quality, financial inclusion, financial literacy, and technological advancements. Economic growth exhibits a robust and positive correlation with the quality of institutions, suggesting that well-designed governance frameworks and efficient regulatory policies foster an environment that is conducive to sustainable development (Adanma and Ogunbiyi, 2024). The importance of institutional quality in economic transformation highlights the critical roles of political stability, adherence to the rule of law, and the mitigation of corruption in promoting economic development. Financial inclusion represents a pivotal element that significantly impacts economic growth (Khan et al., 2024). The notable and substantial impact indicates that the expansion of financial services to populations that were previously unbanked improves access to credit, fosters savings, and stimulates investment in productive enterprises. The financial sector assumes a crucial role in economic development by facilitating the efficient allocation of resources and supplying individuals and enterprises with the requisite capital to enhance their operations, a properly functioning financial sector guarantees that economic agents have access to vital financial services, thereby fostering economic stability and growth (Wang et al., 2025). The findings further underscore the significance of financial literacy as a catalyst for economic development. A financially literate populace is more adept at making informed financial decisions, managing risks, and engaging in long-term wealth accumulation (Kesuma et al., 2025). Financial literacy significantly improves individual financial well-being and fosters national economic stability by diminishing the probability of financial crises resulting from suboptimal financial decisions. Furthermore, financial literacy empowers households to strategies for the future, optimize the utilization of available financial instruments, and adeptly navigate intricate financial

**Table 3: Pairwise correlations**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Econs | 1.000 | | | | | | | | | | | |
| (2) Institutions | 0.414 | 1.000 | | | | | | | | | | |
| (3) Financial | 0.147 | 0.627 | 1.000 | | | | | | | | | |
| (4) Literacy | 0.364 | 0.192 | 0.096 | 1.000 | | | | | | | | |
| (5) GCF | 0.375 | 0.351 | 0.042 | 0.791 | 1.000 | | | | | | | |
| (6) GE | 0.604 | 0.416 | 0.280 | 0.607 | 0.619 | 1.000 | | | | | | |
| (7) Population | 0.252 | 0.261 | 0.243 | 0.267 | 0.406 | 0.342 | 1.000 | | | | | |
| (8) ICT | 0.014 | 0.206 | 0.190 | 0.210 | 0.177 | 0.336 | 0.184 | 1.000 | | | | |
| (9) Trade | 0.353 | 0.341 | 0.242 | 0.579 | 0.555 | 0.610 | 0.436 | 0.217 | 1.000 | | | |
| (10) FDI | 0.419 | 0.019 | 0.099 | 0.398 | 0.374 | 0.552 | 0.205 | 0.155 | 0.485 | 1.000 | | |
| (11) Age | 0.090 | 0.162 | 0.166 | 0.265 | 0.186 | 0.445 | 0.091 | 0.732 | 0.212 | 0.092 | 1.000 | |
| (12) Tech | 0.490 | 0.087 | 0.237 | 0.497 | 0.432 | 0.645 | 0.008 | 0.255 | 0.342 | 0.686 | 0.313 | 1.000 |

Author's Computation (2025)

**Table 4: Effect of institutional quality, financial inclusion, financial literacy, on economic growth in Africa**

| Variable | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Econs | Institutions | Financial | Literacy | Tech |
| Econs | | 0.319*** (0.21) | 0.205*** (1.37) | 0.007*** (0.17) | 0.0049*** (0.08) |
| Institutions | 0.127*** (0.42) | | 0.093*** (0.98) | 0.039*** (1.90) | 0.006*** (2.45) |
| Financial | 1.158*** (0.43) | 2.092*** (0.63) | | 0.247*** (2.25) | 0.027*** (2.31) |
| Literacy | 0.872*** (0.51) | 1.475*** (0.34) | 0.591*** (1.62) | | 0.028** (2.63) |
| Gcf | 0.0283*** (0.15) | 0.154*** (0.16) | 0.0917*** (1.12) | 0.00018*** (0.01) | 0.00814*** (3.96) |
| Ge | 0.881*** (0.55) | 1.005*** (1.09) | 0.234*** (1.05) | 0.122*** (1.57) | 0.0201** (2.87) |
| Population | 13.44*** (0.21) | 57.42*** (0.13) | 41.69*** (1.19) | 8.634*** (1.13) | 0.497*** (0.90) |
| ICT | 0.157*** (0.42) | 0.407*** (0.94) | 0.0873*** (1.60) | 0.0160*** (0.66) | 0.0085*** (2.56) |
| Trade | 129.9*** (0.50) | 258.9*** (0.25) | 109.6*** (1.33) | 47.97*** (2.38) | 4.223*** (1.82) |
| Fdi | 71.27*** (0.36) | 145.4*** (0.33) | 51.33*** (1.36) | 30.44*** (2.89) | 2.607*** (1.85) |
| Age | 1.597*** (0.16) | 11.52*** (0.87) | 3.984** (2.62) | 0.831*** (1.03) | 0.154*** (1.86) |
| Tech | 4.479*** (0.37) | 7.969*** (0.25) | 0.0417*** (0.01) | 0.523*** (0.93) | |
| L. Econs | 0.449*** (1.03) | | | | |
| L. Institutions | | 0.781*** (0.73) | | | |
| L. Financial | | | 0.476*** (1.39) | | |
| L. Literacy | | | | 0.768*** (6.47) | |
| L. Tech | | | | | 0.980*** (9.85) |
| _Cons | 0.478*** (0.01) | 1.310*** (0.01) | 18.34*** (1.06) | 4.820*** (0.93) | 1.349** (2.95) |
| Hasen J | 0.665 | 0.344 | 0.233 | 0.122 | 0.654 |
| Sagan test | 0.332 | 0.722 | 0.122 | 0.334 | 0.922 |
| AR2 | 0.082 | 0.221 | 0.655 | 0.675 | 0.211 |
| N | 378 | 378 | 378 | 378 | 378 |

*t*-statistics in parentheses
*P<0.05, **P<0.01, ***P<0.001
Author's Computation (2025)

markets. The findings indicate that enhancing financial literacy ought to be a primary focus for policymakers seeking to strengthen economic resilience and foster inclusive development.

Technological advancement constitutes a vital determinant of economic development, as evidenced by the substantial positive influence of technology on economic transformation. The advent of digital infrastructure, mobile banking, and financial technology innovations has fundamentally transformed financial services, enhancing their accessibility and efficiency (Alam et al., 2025). The incorporation of technology into economic activities augments productivity, diminishes transaction costs, and promotes financial inclusion. The contribution of technology to economic growth is further substantiated by its interplay with financial literacy, indicating that individuals possessing a higher level of financial literacy are more inclined to embrace and derive advantages from technological innovations within the financial sector. Numerous control variables incorporated into the analysis, including gross capital formation, government expenditure, trade openness, foreign direct investment, and population growth, demonstrate substantial effects on economic growth. Gross capital formation exerts a favorable impact on economic growth, underscoring the significance of investment in both physical and human capital as a catalyst for development. Government expenditure plays a pivotal role in fostering economic growth by delivering essential public products and services, improving infrastructure, and bolstering social programs. Trade openness has been demonstrated to be advantageous for economic development, suggesting that increased integration into the global economy fosters efficiency, innovation, and competitiveness.

Foreign direct investment (FDI) is instrumental in fostering economic growth by facilitating the influx of capital, enabling the transmission of technology, and creating employment opportunities (Nguyen et al., 2025). The beneficial effects of foreign direct investment (FDI) indicate that prioritizing the attraction of foreign capital should be a fundamental objective for African economies aiming to expedite their economic transformation. Population growth significantly influences economic development, underscoring the necessity for policies that leverage demographic dividends by investing in education, healthcare, and job creation. The influence of age on economic growth further substantiates the assertion that a highly educated and competent workforce is imperative for sustainable development. The incorporation of latent variables substantiates the enduring nature of economic growth, institutional quality, financial inclusion, financial literacy, and technological advancement over time. The findings suggest that historical values of these variables exert a substantial impact on their present levels, indicating that economic transformation is a cumulative process. This underscores the necessity for long-term policy strategies that priorities institutional development, reforms within the financial sector, and advancements in technology.

The model's validity is substantiated through a series of diagnostic assessments, which encompass the Hansen J test, the Sargan test, and the AR (2) test. The findings suggest that the instruments employed in the generalized method of moments (GMM) estimation are legitimate, and there is no evidence of second-order serial correlation. These findings offer substantial empirical evidence for the robustness of the estimated coefficients and the dependability of the results.

Table 5 indicates the model's interaction effects, showing how financial inclusion and literacy have a moderating role in determining how institutional quality and economic growth are related in Africa. The relevance of these interaction terms emphasizes how crucial human and financial resources are in assessing how well institutional frameworks promote economic growth. According to the relationship between financial inclusion and institutional quality, having access to money increases the influence that healthy institutions have on the state of the economy. According to Chinoda and Kapingura (2024) financial inclusion increases institutional efficiency by giving economic agents more access to credit and investment opportunities. Mollick and Sui (2024) highlight how financial expansion without robust institutions might result in inefficiencies and rent-seeking behavior, which would impede economic progress.

Higher literacy rates increase the efficiency of institutions in promoting economic growth, as shown by the relationship between literacy and institutional quality. This is in line with the conclusions of Özdoğan et al. (2025) who claim that the growth of institutions and improved governance results are facilitated by the accumulation of human capital. On the other hand Paul and Storchevoi (2024) contend that institutions dominate economic performance and that, although significant, human capital has a secondary role in determining long-term growth paths. The relationship between gross capital formation and financial inclusion emphasizes how financial services help to make investments, which speeds up economic growth. This corroborates the conclusions of Ofosu-Mensah et al. (2023) who argue that the growth of financial markets is essential to effectively mobilizing and allocating resources. The advantages of financial inclusion may be outweighed by economic instability brought on by excessive financial liberalization without regulatory supervision (Saha and Dutta, 2024).

Higher education also appears to improve the efficiency of investment operations, according to the relationship between literacy and gross capital formation. This supports Goldin (2024) theory that the buildup of human capital is a major force behind economic expansion. However Ogasawara (2025) offers counter-evidence, contending that if the institutional framework is inadequate or unable to efficiently absorb skilled labor; more educational attainment does not always translate into profitable economic consequences. The relationship between government efficacy and financial inclusion highlights how financial access can enhance the influence of good governance on economic expansion. According to Fengju and Wubishet (2024) financial development improves institutional efficiency by fostering competition and lowering corruption. However, according to Pardelli (2024) elites may occasionally seize financial deepening, resulting in unequal access to resources and economic distortions.

The relationship between population and literacy suggests that the impact of demographic shifts on economic performance is mitigated by the growth of human capital. This bolsters the conclusions of

**Table 5: Institutional quality and economic growth in Africa: The moderating role of financial inclusion and literacy**

| Variable | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Econs | Econs | Econs | Econs | Econs | Econs | Econs | Econs | Econs |
| L.Econs | 0.418*** | 0.791*** | 0.583*** | 0.411*** | 0.053*** | 0.268*** | 0.511*** | 0.455*** | 0.440*** |
| | (1.84) | (2.66) | (1.08) | (1.01) | (0.07) | (0.73) | (1.58) | (1.11) | (1.17) |
| Financial | 0.232*** | 1.346*** | 0.501*** | 0.326*** | 2.409*** | 0.502*** | 0.977*** | 0.090*** | 0.845*** |
| | (0.16) | (1.23) | (0.21) | (0.18) | (0.39) | (0.49) | (0.81) | (0.05) | (0.45) |
| Institutions | 0.374*** | 0.426*** | 0.198*** | 0.150*** | 0.120*** | 0.0818*** | 0.154*** | 0.135*** | 0.145*** |
| | (0.51) | (1.16) | (0.37) | (0.57) | (0.34) | (0.05) | (0.62) | (0.66) | (0.67) |
| Literacy | 2.063*** | 0.905*** | 1.470*** | 0.602*** | 0.216*** | 0.442*** | 0.835*** | 0.673*** | 0.244*** |
| | (1.09) | (1.49) | (0.45) | (0.61) | (0.07) | (0.24) | (0.43) | (0.50) | (0.32) |
| GCF | 1.570*** | 3.571*** | 0.133*** | 0.052*** | 0.402*** | 0.029*** | 0.078*** | 0.163*** | 0.0106*** |
| | (0.96) | (0.59) | (0.35) | (0.22) | (1.01) | (0.29) | (0.51) | (1.37) | (0.07) |
| GE | 1.423*** | 0.0378*** | 0.148*** | 0.059*** | 1.490*** | 0.125*** | 0.156*** | 0.554*** | 0.389*** |
| | (0.95) | (0.06) | (0.07) | (0.14) | (0.66) | (0.21) | (0.20) | (0.77) | (0.79) |
| Population | 31.27*** | 95.19*** | 80.50*** | 5.213*** | 104.3*** | 44.74*** | 47.16*** | 31.78*** | 19.05*** |
| | (0.46) | (0.98) | (0.45) | (0.03) | (0.89) | (0.91) | (0.62) | (0.59) | (0.31) |
| ICT | 0.507*** | 0.0459*** | 0.145*** | 0.029*** | 2.126*** | 0.381*** | 0.043*** | 0.137*** | 0.015*** |
| | (0.85) | (0.20) | (0.72) | (0.38) | (0.52) | (0.45) | (0.41) | (0.75) | (0.24) |
| Trade | 45.21*** | 153.4*** | 182.2*** | 131.9*** | 155.1*** | 132.0*** | 162.3*** | 108.0*** | 145.8*** |
| | (0.34) | (1.68) | (0.35) | (0.61) | (0.33) | (1.13) | (0.64) | (0.48) | (0.77) |
| Fdi | 23.54*** | 34.16*** | 77.79*** | 77.75*** | 5.506*** | 30.48*** | 183.6*** | 58.89*** | 93.47*** |
| | (0.30) | (0.41) | (0.31) | (0.66) | (0.02) | (0.35) | (1.10) | (0.68) | (0.93) |
| Age | 17.93*** | 1.337*** | 3.186*** | 6.610*** | 0.957*** | 2.217*** | 1.937*** | 11.81*** | 5.552*** |
| | (1.08) | (0.28) | (0.39) | (1.44) | (0.13) | (0.59) | (0.17) | (0.44) | (1.29) |
| Tech | 10.71*** | 6.282*** | 6.789*** | 0.392*** | 8.696*** | 1.527*** | 2.157*** | 6.236*** | 39.62*** |
| | (0.82) | (0.96) | (0.53) | (0.08) | (1.33) | (0.37) | (0.50) | (1.10) | (0.90) |
| Fin*Institu | 0.061*** | | | | | | | | |
| | (0.54) | | | | | | | | |
| Lite*Gcf | 0.029*** | | | | | | | | |
| | (0.94) | | | | | | | | |
| Fin*GCF | | 0.063*** | | | | | | | |
| | | (0.60) | | | | | | | |
| Lite*Institu | | 0.003*** | | | | | | | |
| | | (0.57) | | | | | | | |
| Fin*Ge | | | 0.04*** | | | | | | |
| | | | (0.25) | | | | | | |
| Lite*Popul | | | 2.42*** | | | | | | |
| | | | (0.61) | | | | | | |
| Fin*Popul | | | | 0.45*** | | | | | |
| | | | | (0.18) | | | | | |
| Lite*GE | | | | 0.08*** | | | | | |
| | | | | (0.80) | | | | | |
| Fin*ICT | | | | | 0.04*** | | | | |
| | | | | | (0.57) | | | | |
| Lite*Trade | | | | | 1.58*** | | | | |
| | | | | | (0.53) | | | | |
| Fin*Trade | | | | | | 1.658*** | | | |
| | | | | | | (0.82) | | | |
| Lite*ICT | | | | | | 0.0082 | | | |
| | | | | | | (0.48) | | | |
| Fin*FDI | | | | | | | 1.55*** | | |
| | | | | | | | (3.38) | | |
| Lite*AGE | | | | | | | 0.04*** | | |
| | | | | | | | (0.14) | | |
| Fin*AGE | | | | | | | | 0.217*** | |
| | | | | | | | | (0.50) | |
| .Lite*FDI | | | | | | | | 2.089*** | |
| | | | | | | | | (1.93) | |
| Fin*Tech | | | | | | | | | 0.124*** |
| | | | | | | | | | (0.16) |
| Lite*Tech | | | | | | | | | 0.595 |
| | | | | | | | | | (0.92) |
| Hansen J | 0.371 | 0.112 | 0.321 | 0.228 | 0.343 | 0.332 | 0.211 | 0.911 | 0.213 |
| Sagan test | 0.431 | 0.331 | 0.665 | 0.377 | 0.822 | 0.231 | 0.661 | 0.766 | 0.112 |
| AR2 | 0.322 | 0.334 | 0.721 | 0.761 | 0.121 | 0.351 | 0.678 | 0.321 | 0.085 |
| _Cons | 174.1 | 132.5 | 76.91 | 45.74 | 132.6 | −3.985 | 9.035 | 43.14 (1.62) | −37.02 |
| | (1.05) | (0.08) | (0.55) | (0.52) | (0.74) | (−0.04) | (0.11) | | (−0.48) |
| N | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 |

*t* statistics in parentheses
*P<0.05, **P<0.01, ***P<0.001
Author's Computation (2025)

Selesi-Aina et al. (2024) who highlight how education can enhance productivity and labour market outcomes. However George (2024) warns that highly educated workforce could not always translate into greater economic growth if there is not enough job creation. Population size and financial inclusion are also correlated, indicating that increased access to financial services amplifies the economic advantages of population expansion. This is in line with the findings of Mishra and Mishra (2024) who contend that the growth of the financial sector promotes employment creation and entrepreneurship. Keh et al. (2025) point out that if structural obstacles like inadequate financial literacy continue, financial inclusion on its own is insufficient. The relationship between ICT and financial inclusion emphasizes how digital technology can improve institutional efficacy and financial markets. This result is consistent with the Adelaja et al. (2024) which demonstrates how digital financial services may greatly increase economic participation and financial inclusion. However Matli and Malatji (2024) caution that although ICT can improve financial access, its efficacy may be constrained by differences in digital infrastructure and literacy. The relationship between trade openness and literacy implies that education increases the advantages of globalization by giving people the tools they need to compete in global marketplaces. This backs up Aksoy et al. (2024) argument that trade liberalization helps nations with highly skilled labor. Nevertheless Soukharev (2025) warns that if education levels are not properly spread throughout the population, trade openness may potentially make inequality worse. Additionally, commerce and financial inclusion have a positive relationship, suggesting that financial services help people and businesses capitalize on opportunities in international markets. This is in line with Sare et al. (2025) who emphasize how financial development helps to expand commerce. Balasundharam and Khadan (2025) contend however that financial liberalization may leave economies vulnerable to volatility and outside shocks in the absence of suitable policy measures.

Financial access has a crucial role in amplifying the ripple effects of foreign capital inflows, as demonstrated by the relationship between financial inclusion and FDI. This result backs up the claim made by Mashrur (2025) that foreign direct investment (FDI) boosts economic growth when it is backed by a strong banking system. Iqbal et al. (2025) point out those complementing elements like institutional quality and human capital as necessary for FDI's growth-enhancing benefits. Likewise, the correlation between literacy and foreign direct investment implies that education improves the ability of foreign capital to be absorbed. Notermans and Piattoni (2025) notified however that the advantages of FDI are not always guaranteed and rely on the larger institutional and regulatory framework. Lastly, the relationship between technology and financial inclusion implies that financial services are essential for facilitating the adoption and innovation of new technologies.

## 5. CONCLUSION, RECOMMENDATION, AND POLICY IMPLICATION

This study underscores the pivotal importance of institutional quality in fostering economic growth in Africa, while also accentuating the substantial moderating influences of financial inclusion and literacy. It is concluded that robust institutions, distinguished by transparency, accountability, and effective governance, are imperative for promoting sustainable economic development. Nevertheless, the study indicates that the influence of these institutions is significantly augmented when populations have access to financial services and possess the requisite literacy skills to engage effectively with economic opportunities. Financial inclusion promotes increased engagement in the economy among marginalized groups, whereas literacy improves individuals' capacity to traverse institutional frameworks and utilize resources efficiently. This interplay generates a synergistic effect that drives economic growth. In consideration of these findings, the study advocates for African governments and policymakers to implement a multi-faceted approach to development. Initiatives aimed at enhancing institutional quality should priorities the mitigation of corruption, the safeguarding of judicial independence, and the promotion of effective governance. Concurrently, enhancing access to financial services, especially in rural and marginalized regions, is essential to facilitate greater economic participation. This encompasses the allocation of resources towards digital financial technologies and mobile banking platforms. Equally significant is the necessity to enhance literacy rates and to align educational systems with the dynamic requirements of the economy, thereby ensuring that individuals acquire the competencies essential for meaningful participation in economic activities. The findings of this study indicate that development strategies in Africa should incorporate institutional reforms alongside initiatives aimed at improving financial inclusion and literacy. Policymakers ought to establish regulations that promote a resilient financial system, while simultaneously ensuring that financial literacy initiatives are both accessible and pragmatic for a variety of demographic groups. Development programs ought to priorities the interaction between institutional quality and the advancement of human capital, directing investments towards enhancing institutional capacity, modernizing financial systems, and ensuring equitable access to education. Moreover, international development partners and donors ought to concentrate on these interrelated priorities when extending assistance to African nations.

Future research ought to investigate the intricate relationships among institutional quality, financial inclusion, and literacy within particular African regions or nations, while acknowledging the continent's inherent diversity. Longitudinal studies have the potential to yield profound insights into the temporal evolution of these factors and their subsequent impact on economic outcomes. Furthermore, subsequent research should examine the impact of emerging technologies, including block chain and financial technology (fintech), on fortifying institutions and enhancing financial inclusion. An analysis of gender disparities in financial inclusion and literacy, along with their implications for economic development, would yield significant insights for policymakers. Ultimately, comparative analyses conducted across various regions may elucidate exemplary practices and innovative methodologies that could be tailored to the African context. It is imperative to tackle the interrelated challenges of institutional quality, financial inclusion, and literacy in order to realize Africa's economic potential. Capitalizing on these synergies, African nations can promote inclusive growth, mitigate poverty, and establish a robust foundation for enduring sustainable development.

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