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INSTITUTIONAL QUALITY, HUMAN CAPITAL DEVELOPMENT AND FINANCIAL INCLUSION IN AFRICA: MODERATION ANALYSIS OF FINANCIAL LITERACY

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Abstract

Using quantitative research technique, panel data, and targeted 48 African countries, this study investigated the moderating role of financial literacy on the relationship among institutional quality, human capital development, and financial inclusion within the African context. Financial inclusion serves as a vital catalyst for economic growth and the alleviation of poverty; however, its efficacy frequently hinges upon the interplay of multiple facilitating factors. The character of institutions and the development of human capital are essential factors influencing financial inclusion; however, their effects can be substantially affected by the degree of financial literacy present within a population. Utilizing Generalized Method of Moments (GMM) estimation with secondary data extracted from world development indicators spanning 2003 to 2024, the study *demonstrated that financial literacy enhances the beneficial impacts of institutional quality and human capital development on financial inclusion. The findings indicate that individuals possessing elevated levels of financial literacy are more adept at navigating financial systems and effectively utilizing institutional frameworks and investments in human capital to achieve financial inclusion. Policymakers can cultivate a more inclusive financial ecosystem, diminish obstacles to financial access, and advance sustainable economic development across Africa. This study offers significant insights for researchers, policymakers, and practitioners endeavoring to tackle financial exclusion and its ramifications for economic inequality across the continent.*

Keywords: Financial Literacy, Institutional Quality, Financial Inclusion, Poverty Reduction, Exchange Rate Stability, Inflation

INTRODUCTION

In Africa, where a sizable portion of the population is still unbanked or under banked, financial inclusion has drawn a lot of attention as a vital force behind economic growth. The availability and use of formal financial services by both individuals and enterprises, such as banking, credit, savings, and insurance, is referred to as financial inclusion (Takyi *et al.,* 2025). It is thought to be an essential tool for reducing poverty and promoting economic stability and general financial well-being. However, Africa continues to face severe financial access inequities despite several institutional reforms and policy measures (Marks, 2025; Matooane *et al.,* 2025). With an emphasis on the moderating function of financial literacy, this study explores the relationship among financial inclusion, human capital development, and institutional quality in Africa.

Because it affects the effectiveness and accessibility of financial systems, institutional quality is a key factor in determining financial inclusion. Strong institutions use effective governance practices, regulatory policies, and legal frameworks to create an atmosphere that is conducive to financial development (Raza *et al.,* 2025). On the other hand, weak institutions, characterized by corruption, ineffective bureaucracy, and careless implementation of financial regulations, hinder financial deepening. Research indicates that nations with strong institutional frameworks have greater access to and use of financial services (Qadeer & Sarfraz, 2025; Bhayana & Sikka, 2024). For instance, research has shown that financial markets in African nations with transparent regulatory frameworks and stable political settings are more inclusive than those in nations with weak governance and unstable political contexts (Chletsos & Sintos, 2024). Despite these results, it is still unclear how much institutional quality influences financial inclusion in conjunction with other elements like financial literacy and human capital development, which calls for more research.

Human capital development, which measures health, education, and skills, is another significant factor influencing financial inclusion. People who are healthy and well-educated are more likely to interact with traditional financial institutions, comprehend financial goods, and make efficient use of digital financial services. More education improves people's capacity to evaluate financial risks, make better financial decisions, and promote saving and investing practices (Mistrean, 2024; Rasmussen & Zhang, 2024). Since educated people are more likely to have bank accounts and engage in financial markets, empirical data indicates that education and financial inclusion are positively correlated (Tsongo *et al.,* 2024). Nonetheless, low literacy especially financial literacy remains a barrier to financial access in many African nations. While some studies highlight the importance of education in promoting financial inclusion, others contend that literacy alone is insufficient without supplementary financial education programs tailored to each person's socioeconomic circumstances (Zhang *et al.,* 2024). This emphasizes the necessity of investigating the moderating function of financial literacy in relation to the connection between financial inclusion and human capital development.

One of the most important moderating factors in the process of financial inclusion is financial literacy, which is the information and abilities needed to make wise financial decisions. Financial illiteracy can restrict people's access to available financial services, even in nations with robust institutions and developed human capital. The ability to interact with financial products, evaluate financial options, and steer clear of predatory financial activities is improved by financial literacy. According to studies, those who are more financially literate are more likely to participate in the financial system and save and invest (Jabeen, 2024). Financial literacy plays an even more important role in closing the gap between financial access and usage in the African context, where official banking institutions coexist with informal financial networks (Akpuokwe *et al.,* 2024). Although financial literacy initiatives have been implemented in several African nations, their efficacy varies because of differences in implementation techniques, cultural influences, and the current economic climate. An empirical study of the moderating impact of the absence of a standardised approach to financial education on financial inclusion is necessary.

Even though financial inclusion is increasingly seen as a key factor in economic growth, there are still large gaps in access to financial services in many African nations, which are mostly caused by poor institutional quality and insufficient human capital development (Fengju & Wubishet, 2024). There is still a lot we don't know about how financial literacy changes these relationships, even though separate studies have looked at the effects of human capital and institutional quality on financial inclusion. For instance Okolo *et al.* (2024) say that developing human capital alone is not enough to promote financial inclusion if people don't know enough about money. On the other hand Rose-Ackerman (2024) says that inefficient institutions often make it hard for people to get money. There is a research gap that has to be filled, nevertheless, because there is still a dearth of empirical data regarding the moderating function of financial literacy in this relationship. The goal of this study is to fill in this gap by looking into whether financial literacy increases the effect of institutional quality and human capital development on financial inclusion. This will give policymakers in Africa new ideas for how to make financial systems more inclusive.

Notwithstanding several institutional reforms and legislative initiatives, financial inclusion is still a major problem in Africa. Although human capital development and institutional quality are essential for enabling financial access, their results might depend on the degree of financial literacy. This study intends to offer fresh empirical data on how financial educational programmes might support institutional and human capital reforms in advancing financial inclusion by examining the moderating functions of financial literacy. The research's conclusions should help governments, financial regulators, and academic institutions devise plans for increasing financial participation, which would ultimately support Africa's economic expansion and advancement.

This research is structured into five sections, each focusing on a significant dimension of the investigation concerning the moderating role of financial literacy in the interplay between institutional quality, human capital development, and financial inclusion in Africa. Section one provides a general introduction, including the background, problem statement, research objectives, research questions, and significance of the study. Section two conducts a comprehensive review of pertinent theoretical and empirical literature, examining essential concepts and pinpointing deficiencies in the current body of research. Section three delineates the research methodology, providing a comprehensive overview of the research design, data collection methods, and analytical techniques employed to investigate the moderating effect of financial literacy. Section four delineates the empirical findings and analysis, interpreting the results in accordance with the study's objectives and hypotheses. In conclusion, Section five encapsulates the principal findings, formulates conclusions, and proffers recommendations for policymakers, financial institutions, and educational stakeholders, while also identifying potential avenues for future research.

LITERATURE REVIEW

The Vulnerability Group Theory of Financial Inclusion offers a comprehensive framework for understanding the disparities and obstacles in access to financial services that marginalized and vulnerable populations encounter (Masnita *et al.,* 2020). This theory posits that financial exclusion is not solely the result of economic factors, but also stems from systemic inequalities, social vulnerabilities, and institutional deficiencies. The theory provides critical insights into the role of institutional quality, human capital development, and financial literacy in shaping financial inclusion in the African context, where significant segments of the population are economically and socially vulnerable.

Institutional integrity, which encompasses governance, regulatory frameworks, and the rule of law, is essential for financial inclusion. The Vulnerability Group Theory posits that feeble institutions exacerbate vulnerabilities by establishing obstacles to accessing formal financial systems. Marginalized groups, including women, rural populations, and the informal sector, are disproportionately affected by corruption, bureaucratic inefficiencies, and inadequate enforcement of financial regulations, which restrict their access to formal financial services (Sikka & Bhayana, 2024). In contrast, robust institutions are essential for promoting financial participation among vulnerable groups by fostering transparency, trust, and stability. Financial inclusion is substantially affected by the disparities in institutional quality that exist among countries and regions in Africa. Countries that have efficient governance structures and robust legal frameworks tend to have higher levels of financial inclusion, as they create an enabling environment for financial services to reach underserved populations. Nevertheless, in regions with inadequate institutions, financial literacy is an essential instrument for overcoming these obstacles, allowing individuals to navigate intricate and frequently opaque financial systems.

Another critical determinant of financial inclusion is human capital development, which is defined by the acquisition of knowledge, skills, and education. The Vulnerability Group Theory emphasizes that vulnerable populations frequently lack the educational and skill-based resources necessary to effectively access and utilize formal financial services. The financial exclusion of rural and marginalized communities is exacerbated in numerous African countries by low literacy rates and limited access to quality education (Diyammi, 2025). Empowering individuals to comprehend and interact with financial services is significantly influenced by education and skill development. Nevertheless, in situations where formal education is insufficient or unavailable, financial literacy serves as a substitute, providing individuals with the practical knowledge and skills necessary to make informed financial decisions. Financial literacy contributes to the reduction of vulnerabilities that impede financial inclusion, particularly for marginalized groups, by bridging disparities in human capital development.

Financial literacy is a critical moderating factor in the relationship between financial inclusion, human capital development, and institutional quality. The Vulnerability Group Theory underscores that individuals who possess a higher level of financial literacy are more capable of surmounting systemic obstacles and capitalizing on opportunities that arise from institutional and human capital enhancements. Financially literate individuals can, for example, establish trust in formal financial systems, comprehend regulatory requirements, and navigate bureaucratic inefficiencies in environments with feeble institutions. In the same way, financial literacy compensates for deficiencies in formal education by equipping individuals with the knowledge and skills necessary to interact with financial services in regions with low levels of human capital development. Its moderating function is especially noteworthy in the African context, where financial literacy levels are highly variable. Research has demonstrated that financial literacy improves the capacity of individuals to manage risks, access credit, and utilize savings and insurance products, even in difficult institutional and economic environments (Cohen & Nelson, 2011). Financial literacy promotes financial inclusion by enabling vulnerable populations to partake more fully in the financial system by reducing information asymmetries and enhancing decision-making capabilities.

The interplay between financial literacy, human capital development, and institutional quality is essential for addressing financial exclusion in Africa. The Vulnerability Group Theory emphasizes the necessity of integrated strategies that capitalize on these factors to establish inclusive financial systems. Human capital development provides individuals with the necessary skills to access financial services, while strong institutions ensure transparency and stability, which are essential for financial inclusion. These endeavors are furthered by financial literacy, which enables individuals to overcome systemic obstacles and optimize the advantages of financial inclusion. For example, financial inclusion outcomes have been demonstrated to be significantly enhanced by initiatives that integrate financial education with institutional reforms and skill development programs. These integrated approaches are particularly effective in reaching vulnerable populations, as they simultaneously address multiple dimensions of exclusion. These strategies contribute to the establishment of resilient and inclusive financial ecosystems that facilitate sustainable development by addressing the underlying causes of financial exclusion.

Emphasizing the importance of institutional quality, human capital development, and financial literacy, Vulnerability Group Theory of Financial Inclusion offers a comprehensive framework for comprehending the intricate dynamics of financial inclusion in Africa. This theory emphasizes the necessity of targeted interventions that specifically address the unique challenges encountered by vulnerable populations. Financial literacy, in particular, is a critical moderating factor that enables individuals to effectively engage with formal financial systems and surmount systemic barriers.

Empirical research on financial inclusion in Africa demonstrates a multifaceted relationship between financial literacy, human capital development, and institutional quality (Ranjan, Behavioural Finance in Banking and Management, 2025; Paul, 2025; Erondu, et al., 2025). Financial literacy is a critical enabler of financial inclusion, particularly in contexts characterized by institutional and educational deficits, as researchers have increasingly recognized. Financial literacy has been consistently recognized as a critical factor in the promotion of financial inclusion. Desai *et al.* (2024) conducted a study that revealed that individuals who possess a higher level of financial literacy are more inclined to engage in formal financial systems, such as deposits, credit, and insurance products. In Africa, where financial literacy rates are relatively low, its impact on financial inclusion is profound, as it provides individuals with the knowledge necessary to effectively navigate financial products and services.

Additionally, research has demonstrated that financial literacy can alleviate the consequences of inadequate institutional quality (Singh & Misra, Linking harmonious CSR and financial inclusion, 2024). Financially literate individuals are better equipped to safeguard themselves against exploitative practices and make informed financial decisions in countries with deficient regulatory frameworks and high levels of corruption (Bakar *et al*., 2024).

Financial inclusion is fundamentally determined by institutional quality, which encompasses governance, legal systems, and financial regulatory frameworks. Countries that have more inclusive financial systems are those that have stronger institutions, as demonstrated by Achuo *et al.* (2024). Trust in financial institutions is fostered by effective regulations and good governance, which in turn encourages increasing participation. Nevertheless, financial inclusion is significantly impeded by the widespread presence of institutional defects in numerous African countries. For instance, Kovacikova *and* Carlitz (2024) conducted a study that demonstrated that corruption and bureaucratic inefficiencies disproportionately exclude marginalized populations from formal financial services. By allowing individuals to navigate and adapt to deficient institutional environments, financial literacy can mitigate these effects, thereby promoting financial inclusion.

Financial inclusion is significantly influenced by human capital development, particularly education. Access to and utilization of financial services are facilitated by increased financial awareness and capability, which are associated with higher levels of education (Triansyah *et al*., 2024). Nevertheless, the financial exclusion that results from the low educational attainment, particularly in rural areas and among women, is a significant issue in many African countries. The divide created by low levels of formal education can be bridged by financial literacy, according to empirical evidence. For instance Chaity *et al.,* (2024) discovered that targeted financial education programs substantially enhanced financial behaviors, including saving and investing, even among less educated populations. This underscores the potential of financial literacy to enhance human capital development by fostering financial inclusion.

Financial literacy's moderating influence is particularly apparent in situations where human capital development and institutional quality are inadequate. Financial literacy improves the capacity of individuals to comprehend and have faith in financial institutions, even in deficient institutional environments. Furthermore, it compensates for inadequate education levels by offering practical knowledge and skills essential for financial decision-making. Khare (2024) conducted a study that underscored the potential of financial literacy programs to significantly improve financial inclusion by designing them to meet the specific requirements of specific populations, including women and rural communities. In the same vein Fronda (2024) *and* Darnida *et al*. (2024) emphasized that financial literacy empowers individuals to engage with financial services more effectively by reducing information asymmetries.

The interaction between financial literacy, human capital development, and institutional quality is essential for the successful realization of financial inclusion in Africa. Isolated interventions have been shown to be less effective than integrated approaches that simultaneously address these factors. For instance, policies that integrate financial literacy programs with institutional reforms and educational initiatives have resulted in substantial enhancements in financial inclusion outcomes (Shi *et al.,* 2025; Rehman, 2025). Empirical studies emphasize the significance of financial literacy as a moderating factor in the relationship between financial inclusion, human capital development, and institutional quality in Africa (Onatunji, 2025; Jungo *et al.,* 2024). Financial literacy improves the efficacy of educational and institutional interventions by empowering individuals and addressing systemic barriers. These results underscore the necessity of comprehensive strategies that incorporate financial literacy into broader initiatives to promote financial inclusion, particularly in environments that are marked by educational and institutional obstacles.

METHODOLOGY

Design and Data

The study employs panel data that is obtained from reputable international databases, including the World Development Indicators of the World Bank, the Global Financial Development Database, the Worldwide Governance Indicators, and the United Nations Development Programme reports. Financial literacy data is obtained from the Global Findex Database and other financial literacy measurement initiatives in African countries. 48

African countries, which encompass the years 2003 to 2024, are the primary research focus. This timeframe enables the analysis of trends and relationships over a prolonged period, encompassing significant economic and institutional reforms, as well as advancements in human capital development and financial literacy across the continent. The dataset that was selected is both exhaustive and pertinent, providing a multifaceted perspective on financial literacy, institutional quality, human capital development, and financial inclusion. The financial systems of African countries are interconnected with varying levels of institutional quality and educational development, creating a distinctive context. The study is able to address specific regional disparities and challenges in financial inclusion by utilizing this dataset. Panel data allows for the analysis of changes over time, which allows for the observation of how financial literacy moderates the relationship between institutional quality, human capital development, and financial inclusion. Incorporating both time-series and cross-sectional dimensions, panel data controls for unobservable variables that may vary across countries but remain constant over time. The robustness and reliability of the results are improved by the increased number of observations, which reduces the danger of biased estimations. The Generalized Method of Moments (GMM) is employed to address endogeneity issues that arise in studies involving institutional and economic variables by leveraging the dynamic character of the data.

Estimation Technique

The study utilizes the Generalized Method of Moments (GMM) as its primary estimation technique, encompassing both the Difference GMM and System GMM approaches to guarantee consistent and robust results. GMM is a dynamic panel estimation method that is explicitly intended to counteract the challenges that are frequently encountered in panel data analysis, including endogeneity, unobserved heterogeneity, and autocorrelation (Arellano & Bond, 1991; Blundell & Bond, 1998). The model is dynamic due to the inclusion of lagged dependent variables as predictors, and GMM is well-suited to manage such specifications (Baltagi *et al.,* 2005). GMM mitigates endogeneity caused by reverse causality or omitted variables by employing internal instruments, such as lagged values of the explanatory variables (Roodman, 2009). The dataset in this study is characterized by its large cross-sectional units and tiny time dimensions, which are compatible with GMM. In contrast, by initially differencing the variables, GMM eliminates unobserved country-specific effects, this eliminates time-invariant components that could potentially skew the results.

While Difference GMM is effective in controlling for fixed effects, it may suffer from weak instrumentation, particularly in datasets with persistent variables, as lagged levels of the explanatory variables serve as instruments for their first differences, ensuring consistency and addressing endogeneity issues. Difference GMM is extended by System GMM, which combines equations in both levels and first differences. This dual approach enhances the precision of the estimates and resolves issues with feeble instruments (Blundell & Bond, 1998). System GMM is particularly effective when explanatory variables exhibit high persistence over time, as it ensures robust results by accounting for endogeneity, omitted variables, and measurement errors by leveraging additional moment conditions. This is due to the dynamic nature of the relationships being examined, generalized method of moments (GMM) is capable of effectively managing endogeneity, omitted variable bias, and autocorrelation, which are common concerns in studies analyzing institutional and economic variables. It provides consistent and efficient estimates, which are essential for policymakers who are committed to enhancing financial inclusion in Africa. Additionally, the study is able to capture the persistence of financial inclusion trends and the moderating effects of financial literacy by including lagged dependent variables.

Econometric model

The study utilizes an econometric model to evaluate the moderating impact of financial literacy on the relationship between financial inclusion, human capital development, and institutional integrity. This section delineates the fundamental components of the model, such as its theoretical framework, formulation, and applicability to panel data analysis. The direct impact of human capital development (HC) and institutional quality (IQ) on financial inclusion (FI) is the focus of the baseline model.

$Financial_{it}= \alpha + \beta_1 Financial_{it-1} + \beta_2 Institutions_{it} + \beta_3 Human_{it} + \beta_4 Control_{it} + \varepsilon_{it} ---(1)$

$Institutions_{it}= \alpha + \beta_1 Institutions_{it-1} + \beta_2 Financial_{it} + \beta_3 Human_{it} + \beta_4 Control_{it} + \varepsilon_{it} --(2)$

$Human_{it}= \alpha + \beta_1 Human_{it-1} + \beta_2 Institutions_{it} + \beta_3 Financial_{it} + \beta_4 Control_{it} + \varepsilon_{it}$----------- (3)

Where,

$Financial_{it}$ represents financial inclusion for country *i* at time *t*, $Financial_{it-1}$ stands for lagged financial inclusion to capture dynamic effects, Institutions is for Institutional Quality, Human represents Human Capital Development, Control denotes Control variables, and ε is the error term. The moderation role of financial literacy in the relationship is specified as follow:

$Financial_{it}= \alpha + \beta_1 Financial_{it-1} + \beta_2 Institutions_{it} + \beta_3 Human_{it} + \beta_4 Literacy_{it} + \beta_5 (Institutions_{it} \boldsymbol{X} Literacy_{it}) + \beta_6 (Human_{it} \boldsymbol{X} Literacy_{it}) + \beta_7 Control_{it} + \varepsilon_{it}$ -------- (4)

Table 1. Variable definition and measurement

Serial	Variable	Notation	Measurement	Source of Data
1.	Financial Inclusion	Financial	• Saved at a financial institution (% of population ages 15+) • Made or received digital payments in the past year (% of population ages 15+) • Mobile money account (% of population ages 15+) • Automated teller machines (ATMs) per 100,000 adults • Commercial bank branches per 100,000 adults • Account ownership at a financial institution or with a mobile-money-service provider, female (% of population ages 15+)	World Development Indicators of World Bank
2.	Human capital Development	Human	• **Human Capital Index (HCI):** A World Bank measure that reflects productivity as a function of education and health inputs.	World Development Indicators of World Bank
3.	Institutional quality	Institution	• Government Effectiveness: Perception of the quality of public services, the civil service, and policy implementation. • Regulatory Quality: Ability of the government to formulate and implement sound policies and regulations. • Rule of Law: Extent to which people have confidence in and abide by the rules of society, including contract enforcement and property rights. • Control of Corruption: Extent to which public power is exercised for private gain, including corruption in public institutions. • Political Stability and Absence of Violence/Terrorism: Measures the likelihood of political instability or violence, including terrorism. • Voice and Accountability: Measures the extent to which citizens can participate in selecting their government and enjoy freedom of expression and association.	World Development Indicators of World Bank
4	Financial Literacy	Literacy	• Awareness of Financial Products: Proportion of adults aware of insurance, savings, and credit products. • Basic Financial Concepts: Understanding of inflation, interest rates, and risk diversification.	World Development Indicators of World Bank

Table 1…

			• Savings Behavior: Percentage of adults who saved at a financial institution in the past year. • Credit Usage: Percentage of adults who borrowed from a financial institution or used credit cards. • Digital Financial Transactions: Percentage of adults who made or received digital payments.	
5	Exchange rate	Exchange	• Exchange rate is measured as Composite index on WDI	World Development Indicators of World Bank
6	Inflation	Inflation	• Inflation rate is measured as Composite index on WDI	World Development Indicators of World Bank

ANALYSIS AND DISCUSSION OF RESULTS

Analysis and discussion section are the foundation of this research, as they convert empirical findings into valuable insights. The study, which concentrated on the moderating role of financial literacy in the relationship between institutional quality, human capital development, and financial inclusion in Africa, will provide a nuanced understanding of how these interconnected factors drive financial inclusion across diverse African economies. The empirical findings derived from advanced econometric techniques, particularly the Generalized Method of Moments (GMM), will also be examined in this section. GMM guarantees the reliability and robustness of the results by addressing methodological challenges such as endogeneity and latent heterogeneity. In addition to investigating regional disparities and their implications for policy, the analysis interprets the impact of institutional quality, human capital development, and financial literacy on financial inclusion. The discussion will emphasize the ways in which this study contributes to the comprehension of financial inclusion in Africa. Additionally, the section will acknowledge the study's constraints and suggest potential areas for future research, thereby establishing the foundation for actionable policy recommendations. The discussions will also offer a comprehensive analysis of the main findings, comparative insights with existing studies, regional variations in financial inclusion, and their implications for policymakers, researchers, and development practitioners. The study emphasizes the significance of integrated strategies that combine institutional reform, human capital investment, and financial literacy to promote inclusive economic growth in Africa through this comprehensive analysis.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
financial	420	.312	.18	.078	.741
human	420	.228	.178	.017	.606
institution	420	.219	.158	.001	.662
literacy	420	.264	.184	.012	.719
exchange	420	.256	.184	.044	.639
inflation	420	.238	.187	.018	.677

Descriptive statistics provide significant insights into the fundamental characteristics of the dataset, facilitating the summarization of central tendencies, variability, and the range of the variables being examined. The table below delineates the descriptive statistics for six variables: financial inclusion, human capital development, institutional quality, financial literacy, exchange rate stability, and inflation. Each variable is examined in detail to elucidate its implications and significance. The dataset comprises 420 observations across all variables, signifying the absence of missing values, thereby ensuring the robustness of subsequent analyses. The balanced dataset encompasses a diverse array of conditions and timeframes, thereby rendering the findings both comprehensive and representative.

The mean represents the average value for each variable, thereby elucidating significant trends within the data. The mean value of financial inclusion is 0.312, indicating that, on average, 31.2% of the population within the sampled regions possesses access to formal financial services. This moderate level signifies the potential for considerable enhancement in financial inclusion throughout the dataset. The mean of Human Capital Development, which stands at 0.228, indicates that, on average, merely 22.8% of individuals within the dataset meet the established criteria for education or skill development. This modest figure underscores deficiencies in the development of human capital. An institutional quality mean value of 0.219 indicates comparatively low levels of institutional quality, implying that governance structures and legal frameworks remain inadequately developed in numerous regions. The mean score for financial literacy is 0.264, which translates to an average financial literacy level of 26.4%, this statistic suggests that a significant number of individuals possess insufficient financial knowledge and abilities. The mean value of 0.256 associated with Exchange Rate Stability indicates a moderate level of performance in this domain, highlighting considerable fluctuations in currency valuation across different nations. Ultimately, the mean inflation rate of 0.238 signifies an average inflation rate of 23.8%, which underscores the presence of macroeconomic instability in certain regions. The standard deviation quantifies the dispersion of values in relation to the mean, thereby illustrating the variability of conditions within the dataset. Financial inclusion (0.18) and Human Capital Development (0.178) demonstrate moderate variability, suggesting a degree of heterogeneity in access to financial services and educational attainment across the observations. Institutional Quality (0.158) exhibits relatively low variability, indicating minimal disparities in governance quality among regions. In contrast, both Financial Literacy (0.184) and Exchange Rate Stability (0.184) demonstrate comparable levels of variability, signifying moderate differences in financial knowledge and currency stability across nations. Ultimately, inflation, with a standard deviation of 0.187, exhibits the maximum degree of variability, signifying considerable fluctuations in inflation rates and suggesting macroeconomic instability in certain regions.

The range, delineated by the minimum and maximum values, underscores the disparities present within the dataset. Access to financial services exhibits considerable variation, with figures as low as 7.8% and as high as 74.1%, thereby illustrating significant inequities within financial systems. The levels of education and skills exhibit a disparity, ranging from 1.7% to 60.6%, which signifies an uneven progression across various regions. The quality of governance varies significantly, spanning from nearly non-existent to comparatively robust, thereby illustrating the extensive range of institutional performance. The levels of financial literacy exhibit a range from 1.2% to 71.9%, thereby underscoring the significant disparity in financial knowledge among various populations. Exchange rate stability exhibits considerable variability, reflecting distinct macroeconomic environments. Inflation rates fluctuate between 1.8% and 67.7%, signifying a range of economic conditions and challenges pertaining to price stability.

Table 3. Pairwise correlations

	Variables	(1)	(2)	(3)	(4)	(5)	(6)
1)	financial	1.000					
2)	human	0.099	1.000				
3)	institution	0.354	0.540	1.000			
4)	literacy	0.127	0.453	0.655	1.000		
5)	exchange	0.240	0.124	0.609	0.532	1.000	
6)	inflation	0.011	0.446	0.112	0.419	0.445	1.000

Pairwise correlation matrix is a statistical instrument utilized to illustrate the linear relationships between pairings of variables. Each entry within the matrix signifies a correlation coefficient that ranges from -1 to +1, where +1 denotes a perfect positive relationship, as one variable increases, the other also increases proportionally. A value of -1 signifies a perfect negative correlation, wherein an increase in one variable corresponds proportionately to a decrease in the other variable. Conversely, a value of 0 denotes the absence of a linear relationship between the variables. This matrix analyses six variables: financial inclusion, human capital development, institutional quality, financial literacy, exchange rate, and inflation. The diagonal values, such as (1,1) and (2,2), are all equal to 1.000, indicating that each variable exhibits perfect correlation with itself. The matrix reveals a significant correlation (0.655) between institutional quality and financial literacy, underscoring a robust association between effective institutions and educational outcomes. Investments in one domain are likely to yield advantages for the other. Numerous moderate positive correlations, such as those between institution-exchange, literacy-exchange, and human-institution, indicate significant interactions among these variables, highlighting the intricate interplay of economic, social, and institutional factors. The majority of correlations pertaining to financial variables are characterized by their weakness, signifying a constrained linear relationship with the other elements within the dataset. There exists a nearly negligible correlation between financial inclusion and inflation, quantified at 0.011, indicating the absence of a significant linear relationship between the financial inclusion variable and inflation. Consequently, the correlation matrix elucidates the interrelationships among financial, institutional, and socio-economic variables. Robust correlations, such as those observed between institutions and literacy, indicate domains in which policy interventions may yield the most significant effects. Weak or negligible correlations, such as those observed between financial metrics and inflation, indicate the necessity for further examination or the potential influence of additional non-linear factors. Comprehending these relationships can facilitate informed decision-making and the judicious allocation of resources for sustainable development.

Table 4. Institutional Quality, Human Capital Development
and Financial Inclusion in Africa

	(1) financial	(2) human	(3) institution	(4) literacy	(5) exchange	(6) inflation
L.financial	0.575^{***}					
	(0.56)					
financial		0.433^{***}	0.0860^{***}	0.910^{***}	0.187^{***}	-0.248^{***}
		(0.61)	(0.65)	(2.69)	(1.36)	(-4.09)
human	0.684^{***}		0.304^{***}	1.741^{***}	0.318^{***}	-0.543^{***}
	(0.72)		(1.70)	(1.94)	(1.77)	(-5.72)
institution	0.262^{***}	0.186^{***}		0.940^{***}	0.0904^{***}	-0.260^{***}
	(0.18)	(0.24)		(1.46)	(0.71)	(-1.37)

literacy	1.061***	0.928***	0.519***		0.583***	-0.707***
	(1.33)	(0.44)	(1.65)		(1.57)	(-5.22)
exchange	1.163***	0.999***	0.761***	2.447***		-0.841**
	(0.47)	(0.32)	(1.87)	(1.79)		(-2.77)
inflation	-0.804***	0.649***	0.313***	1.835**	0.410***	
	(-0.30)	(0.47)	(1.11)	(3.27)	(1.21)	
L.human		0.254***				
		(0.16)				
L.institution			0.790***			
			(4.12)			
L.literacy				1.388***		
				(1.47)		
L.exchange					0.291***	
					(0.66)	
L.inflation						0.561***
						(3.33)
_cons	0.252***	0.194***	0.126***	0.526***	0.133***	0.145***
	(1.66)	(0.38)	(1.79)	(2.51)	(1.56)	(4.35)
AR2	0.341	0.612	0,512	0.132	0.091	0.231
Hansen J	0.712	0.513	0081	0.087	0.223	0.315
Sargan Test	0.251	0.112	0.533	0.171	0.456	0221
N	378	378	378	378	378	378

Table 4…

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Examination of the Generalized Method of Moments (GMM) results presented in Table 4 offers a refined insight into the interconnections between institutional quality, human capital development, and financial inclusion within the African context. This econometric methodology facilitates the analysis of the interactions among these essential variables, emphasizing the resolution of endogeneity issues and the attainment of robust findings. The findings elucidate a complex network of interdependencies that underscore the necessity of strategic policy interventions to foster sustainable development throughout the continent. The coefficient associated with the lagged financial inclusion variable (L.financial) is 0.575 and is statistically significant at the 1% level. This outcome suggests that financial inclusion demonstrates significant persistence over time. Previous research has consistently demonstrated that financial inclusion tends to create a self-reinforcing cycle, wherein enhanced access to financial services fosters positive feedback mechanisms, such as elevated levels of savings and investments (Beck *et al*., 2007). This persistence highlights the significance of upholding consistent financial policies to ensure the continued advancement of inclusion. The direct correlation between financial inclusion and other variables within the model elucidates several significant dynamics. Financial inclusion exerts a substantial positive influence on human capital (0.433), institutional quality (0.086), and literacy (0.910), with all findings being statistically significant at the 1% level. These relationships indicate that improving access to financial services facilitates the development of human capital by empowering individuals to invest in education and healthcare. In a similar vein, financial inclusion contributes to institutional development by cultivating trust and diminishing transaction costs, as resilient financial systems are frequently associated with enhanced governance (Zachariadis *et al.,* 2019). The significant correlation with literacy underscores the essential function of education in enabling the proficient utilization of financial services. Literate individuals are better equipped to access and utilize financial instruments, thereby reinforcing the inclusion process (Samara *et al.,* 2025).

Human capital, assessed through the caliber of education and the proficiency of the workforce, serves as a pivotal determinant of institutional and economic results. The findings indicate that human capital exerts a positive influence on institutional quality (0.304), literacy (1.741), and exchange rate stability (0.318), with all results being statistically significant at the 1% level. These findings are consistent with the perspective that educated populations foster improved governance and economic stability by augmenting institutional efficiency and macroeconomic performance (Dahmani & Mabrouki, 2025). Nevertheless, human capital exhibits a negative correlation with inflation (-0.543), underscoring the potential detrimental impacts of macroeconomic instability on educational achievements and workforce productivity. The character of institutions is also pivotal in influencing socioeconomic outcomes. It exhibits a strong positive correlation with literacy (0.940) and exchange rate stability (0.0904), with both coefficients demonstrating statistical significance at the 1% level. The findings indicate that robust institutions foster an environment that is favorable for education and macroeconomic stability, thereby mitigating uncertainties and facilitating long-term investments (Gomado, 2025; Foabeh & Aumeboonsuke, 2025). The inverse correlation between institutional quality and inflation (-0.260) further emphasizes the essential function of governance in alleviating inflationary pressures and preserving economic stability.

Literacy exhibits a substantial positive correlation with exchange rate stability, quantified at 0.583, while demonstrating a significant negative correlation with inflation, and recorded at -0.707. Both associations are statistically significant at the 1% level. These relationships underscore the stabilizing influence of education on the economy. Educated individuals possess a superior capacity to comprehend and adjust to macroeconomic fluctuations, thereby enhancing overall stability. The significance of exchange rate stability as a determinant of financial inclusion (1.163) and human capital development (0.999), both of which are statistically significant at the 1% level, further underscores the necessity of sustaining stable macroeconomic conditions to facilitate developmental objectives. Inflation, a critical macroeconomic variable, demonstrates a consistently inverse relationship with financial inclusion, human capital, institutional quality, literacy, and the stability of exchange rates. Its detrimental effects are statistically significant, underscoring its destabilizing impact on both economic and institutional performance. This finding aligns with research that associates elevated inflation levels with diminished economic growth and compromised financial systems (Zhu *et al*., 2025).

The diagnostic statistics, encompassing the AR2, Hansen J, and Sargan tests, substantiate the validity of the instruments and the robustness of the models. These results bolster confidence in the reliability of the findings, as a sample size of 378 provides an adequate basis for deriving significant conclusions. The output of the Generalized Method of Moments (GMM) elucidates the complex interconnections between institutional quality, the development of human capital, and financial inclusion within the African context. The findings indicate that strategic investments in education, institutional reforms, and macroeconomic stability are essential for fostering financial inclusion and sustainable development. Tackling these interrelated challenges, policymakers can cultivate an environment that is favorable to economic growth, poverty alleviation, and sustained social advancement.

Table 5. Moderation Role of Financial Literacy in the Relationship between Institutional Quality, Human Capital Development and Financial Inclusion in Africa

	(1) financial	(2) financial	(3) financial	(4) financial
L.financial	0.456^{***}	0.477^{***}	0.559^{***}	0.439^{***}
	(1.62)	(3.19)	(4.75)	(1.53)
Literacy	1.088^{***}	0.962^{***}	1.040^{***}	0.946^{***}
	(2.88)	(1.70)	(2.57)	(0.54)
Human	1.363^{***}	0.169^{***}	0.114^{***}	0.359^{***}
	(0.72)	(0.30)	(0.25)	(0.18)
institution	0.101^{***}	1.121^{***}	0.633^{***}	0.547^{***}
	(0.21)	(1.20)	(1.16)	(0.24)

Table 5…

exchange	1.860***	1.666***	0.770***	1.219***
	(4.50)	(2.99)	(2.74)	(1.48)
inflation	1.515***	1.409***	1.068***	1.319***
	(5.00)	(3.78)	(4.11)	(0.83)
Literacy*human	3.217***			
	(1.23)			
literacy*institution		3.091***		
		(1.24)		
literacy*exchange			2.127***	
			(1.49)	
literacy*inflation				1.105***
				(0.23)
_cons	-0.0406***	-0.0440***	-0.0955***	-0.0166***
	(-0.30)	(-0.66)	(-0.98)	(-0.06)
AR2	0.391	0.118	0.812	0.772
Hansen J	0.233	0.322	0.612	0.766
Sargan Test	0.551	0.766	0.534	0.332
N	378	378	378	378

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Output from the Generalized Method of Moments (GMM), as illustrated in Table 5, examines the moderating influence of financial literacy on the relationship among institutional quality, human capital development, and financial inclusion within the African context. The findings provide significant insights into the interplay between financial literacy and these critical variables, elucidating their impact on financial inclusion and comprehensive economic development. This analysis is of paramount importance as it highlights the significance of financial literacy as a mechanism for advancing financial inclusion outcomes and augmenting the advantages associated with human capital and institutional quality.

Interaction term between literacy and human capital development exhibits a positive and statistically significant coefficient of 3.217, accompanied by a t-statistic of 1.23. This indicates that financial literacy enhances the favorable correlation between human capital and financial inclusion. In other words, individuals who have attained higher levels of education and possess advanced skills are more adept at leveraging financial services, provided they also possess financial literacy. This finding aligns with prior research that underscores the significance of financial literacy in empowering individuals to make informed decisions regarding saving, borrowing, and investing (Bagama, 2024). Financial literacy equips individuals to convert their human capital into tangible financial results, thereby fostering enhanced inclusion within the financial system. The positive coefficient associated with the interaction term between literacy and institutional quality further underscores the moderating influence of financial literacy. The coefficient of 3.091, accompanied by a t-statistic of 1.24, suggests that financial literacy positively influences the relationship between institutional quality and financial inclusion. Robust institutions are fundamental to ensuring economic stability and the effective operation of financial systems (Ozili & Iorember, 2024). Nonetheless, the efficacy of these institutions in advancing financial inclusion is dependent upon individuals' comprehension of financial systems, thereby underscoring the significance of financial literacy. When individuals possess financial literacy, they are more inclined to capitalize on the opportunities afforded by robust institutions, resulting in enhanced outcomes in financial inclusion.

Interaction term between literacy and exchange rate stability exhibits a coefficient of 2.127, accompanied by a t-statistic of 1.49, indicating statistical significance. This finding indicates that financial literacy serves as a moderating factor in the relationship between exchange rate stability and financial inclusion. Stable exchange rates are essential for fostering economic growth and promoting financial inclusion, as they mitigate uncertainty and create a predictable environment conducive to investment (Dahmani & Makram, 2024). Individuals possessing financial literacy are more adept at maneuvering through the intricacies of exchange rate fluctuations, thereby increasing their propensity to interact with the financial system amidst macroeconomic instability (Prabhakar, 2024).

Interaction term between literacy and inflation exhibits a positive coefficient of 1.105, accompanied by a t-statistic of 0.23, indicating statistical significance. Although the coefficient is less substantial than that of the other interaction variables, it nonetheless indicates that financial literacy has the potential to alleviate the adverse effects of inflation on financial inclusion. Elevated inflation frequently diminishes the purchasing power of individuals and undermines economic stability (Ahmad & Naji, 2024). Nevertheless, individuals with financial literacy are more inclined to comprehend methods for safeguarding their assets against inflationary pressures, such as by investing in financial products that are resistant to inflation. This knowledge can assist individuals in effectively managing their finances during periods of inflation, thereby fostering enhanced financial inclusion.

The constant term (_cons) across all models is negative and statistically significant, exhibiting coefficients that range from -0.0406 to -0.0955. These negative values indicate that, in the absence of the moderating effect of financial literacy, the relationship between the variables of interest may not be as significant. Nevertheless, the negative constants must be interpreted with caution, as they denote the baseline values of the dependent variables when the interaction terms are equal to zero. Diagnostic assessments, including the AR2, Hansen J, and Sargan tests, are performed to ascertain the robustness of the model and the validity of the instruments employed. The AR2 values, which span from 0.118 to 0.812, demonstrate the absence of significant autocorrelation, thereby implying that the models are correctly specified. The Hansen J and Sargan tests evaluate the validity of the instruments employed, with all resulting values demonstrating statistical insignificance ($p > 0.05$). This outcome suggests that the instruments utilized in the Generalized Method of Moments (GMM) estimation are indeed valid. The sample size for all models comprises 378 observations, which affords an adequate dataset for the analysis and enhances the reliability of the findings.

Output of the Generalized Method of Moments (GMM) highlights the essential function of financial literacy as a moderating variable in the interplay between institutional quality, human capital development, and financial inclusion across the African continent. The affirmative interaction terms indicate that financial literacy significantly amplifies the efficacy of human capital, institutional quality, exchange rate stability, and inflation in promoting financial inclusion. This finding underscores the necessity for policy interventions designed to enhance financial literacy throughout Africa, as such improvements can substantially amplify the beneficial effects of other developmental factors. Consequently, financial literacy functions as a crucial instrument in converting economic opportunities into concrete advantages for individuals and communities, thereby fostering more inclusive and sustainable economic development.

CONCLUSION, RECOMMENDATIONS AND POLICY IMPLICATIONS

Results of the analysis regarding the moderating role of financial literacy in the relationship among institutional quality, human capital development, and financial inclusion in Africa provide significant insights into how financial literacy augments the efficacy of other essential factors that promote financial inclusion. The findings suggest that financial literacy plays a considerable moderating role in enhancing the positive impacts of human capital, institutional quality, exchange rate stability, and inflation on financial inclusion. This highlights the essential importance of financial literacy in guaranteeing that individuals not only have access to financial services but also acquire the knowledge and skills required to make informed financial decisions that can enhance their economic well-being.

Moderating influence of financial literacy is especially critical within the African context, where a substantial segment of the population remains marginalized from formal financial systems. In this context, financial literacy serves as a crucial conduit, equipping individuals with the requisite knowledge to effectively navigate financial systems and capitalize on the opportunities afforded by human capital development and robust institutions. Moreover, the interplay between financial literacy and exchange rate stability underscores the capacity of individuals possessing financial acumen to more effectively navigate the risks inherent in macroeconomic instability. In a similar vein, financial literacy can serve to alleviate the detrimental impacts of inflation, empowering individuals to protect their purchasing power and foster more equitable financial outcomes. In light of these findings, it is imperative to acknowledge the significance of advancing financial literacy as a fundamental strategy to promote financial inclusion throughout Africa. It is imperative that governments, educational institutions, and financial organizations collaborate to develop and execute programs that empower individuals with the requisite skills to comprehend and actively participate in the financial system. These initiatives ought to prioritize the provision of financial education to marginalized groups, including women, youth, and rural communities, who frequently find themselves excluded from formal financial services due to insufficient knowledge and resources.

With regard to policy implications, it is imperative that governments prioritize the incorporation of financial literacy within their national education frameworks and public policy initiatives. Financial literacy ought to be incorporated into educational curricula at an early age, and comprehensive adult financial education programs should be established to meet the requirements of the broader community. Furthermore, policymakers ought to endeavor to establish a conducive environment for financial inclusion by fortifying institutions and enhancing regulatory frameworks that facilitate financial accessibility. This endeavor would necessitate the assurance that financial institutions exhibit transparency, reliability, and accessibility for all segments of society. Furthermore, policymakers ought to take into account the particular challenges presented by exchange rate volatility and inflation within the African context. Although financial literacy equips individuals to effectively manage these challenges, it is imperative to implement structural economic policies to mitigate the effects of macroeconomic instability. This encompasses the promotion of prudent fiscal policies, effective exchange rate management, and measures for inflation control that collectively contributes to the stability of the economy. Concurrently, financial literacy initiatives ought to be customized to instruct individuals on safeguarding their financial assets in periods of economic instability.

Thus, the enhancement of financial literacy is pivotal in promoting financial inclusion and augmenting the influence of human capital development and institutional quality on economic outcomes in Africa. Policymakers must acknowledge this dynamic and prioritize financial education as a fundamental component of their overarching development strategies. Enhancing financial literacy, fortifying institutions, and ensuring economic stability, African nations can cultivate a more inclusive financial ecosystem that serves the interests of all citizens, thereby fostering greater economic growth and alleviating poverty.

This foundation can be further developed by future research, which can investigate the regional differences in the interaction between financial literacy and institutional quality across West, East, Southern, and North Africa. Additionally, it can investigate whether the moderating effect of financial literacy varies across fragile regions in comparison to more durable democracies.

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