How to Cite:
Akrofi, K. S.-A., Ocansey, E. O. N. D., & Oppong Asamoah, F. (2025). Financial innovation as a moderator: Analyzing the interplay between financial inclusion, poverty and economic growth in Africa. *International Journal of Economic Perspectives*, *19*(4), 1565–1586. Retrieved from https://ijeponline.org/index.php/journal/article/view/971

Financial innovation as a moderator: Analyzing the interplay between financial inclusion, poverty and economic growth in Africa

Kwaku Sarbeng-Adjebeng Akrofi
Department of Accounting and Finance, Valley View University, Oyibi, Accra, Ghana
Email: asksabene@gmail.com

Evans O. N. D Ocansey
Department of Accounting and Finance, Valley View University, Oyibi, Accra, Ghana
Email: endocansey@vvu.edu.gh

Felix Oppong Asamoah
Department of Accounting and Finance, Valley View University, Oyibi, Accra, Ghana
Email: felix.asamoah@vvu.edu.gh

***Abstract*---**This study examines the moderating influence of financial innovation on the relationship between economic growth, poverty, and financial inclusion in Africa. The research investigates the ways in which financial innovation promotes economic development, reduces poverty, and enhances inclusion, in light of the transformative potential of financial services. Using panel data from 41 African countries, which were selected through a convenience sampling technique from a total of 54 nations, a quantitative research approach was implemented. The data was obtained from the World Development Indicators (WDI), World Governance Indicators (WGI), and the International Monetary Fund (IMF). In order to mitigate endogeneity concerns and guarantee reliable outcomes, the Generalized Method of Moments (GMM) estimation technique was employed. The results indicate that poverty impedes economic growth, while financial inclusion has a beneficial effect. These relationships are substantially moderated by financial innovation, which enhances the effects of financial inclusion and mitigates the negative impact of poverty.

Corresponding author: *Akrofi, K.S-A, Email:* asksabene@gmail.com
Submitted: 09 February 2025, Revised: 18 March 2025, Accepted: 24 April 2025

Economic outcomes are also significantly influenced by control variables, including education, urbanization, infrastructure development, and regulatory quality. The research posits that policymakers should cultivate a regulatory environment that promotes financial innovation while simultaneously guaranteeing financial stability. It is imperative to invest in financial literacy and digital infrastructure in order to enhance financial inclusion and alleviate destitution. Future research should investigate the long-term consequences of financial innovation on income inequality and perform comparative analyses across regions.

***Keywords*---**Financial innovation, financial inclusion, poverty, economic growth, fintech.

Introduction

In Africa, where persistent challenges such as poverty and financial exclusion continue to impede progress, economic growth remains a fundamental objective for nations worldwide. In order to facilitate savings, investment, and consumption, financial inclusion has become a critical enabler of economic development by increasing the accessibility of individuals to formal financial services (Sikka & Bhayana, 2024). Scholars have been increasingly interested in the correlation between poverty reduction, economic development, and financial inclusion (Memon *et al.*, 2025). Nevertheless, the function of financial innovation in moderating this relationship is an area that is still underexplored, resulting in a research gap. The objective of this study is to investigate the ways in which financial innovation affects the relationship between financial inclusion and poverty and economic growth in Africa. It will provide new perspectives on the dynamics of financial development in the region. Africa's financial inclusion remains subpar, as significant portions of the populace remain unbanked or underbanked, despite significant policy initiatives to enhance financial access (Adelaja *et al.*, 2024). The distribution of financial services, including credit, insurance, and digital banking, has not been uniform among various socioeconomic categories. In theory, financial inclusion is anticipated to stimulate economic development by increasing the efficiency of resource allocation, facilitating investment, and mobilizing savings (Iwedi, 2024; Randa, 2024). Nevertheless, the empirical evidence regarding this relationship has been inconsistent. While some studies like Hassouba (2023) supports the beneficial effects of financial inclusion on growth, Boussaidi *and* Hakimi (2025) emphasize that financial deepening can result in financial instability and inequality. Additionally, there is also scarcity of research on the impact of poverty on economic development through the interaction with financial inclusion.

The absence of attention to the role of financial innovation in enhancing or mitigating the effects of financial inclusion and poverty on economic growth is one of the main limitations in the existing literature. In developing economies, financial innovation has transformed access to financial services through the implementation of mobile banking, digital payments, fintech solutions, and block chain technology (Minarni, 2025; Benamar *et al.,* 2025; Rahardja *et al.*, 2025;

Rambe, 2025; Majewska *et al.*, 2025). It has facilitated the participation of previously excluded populations in the financial ecosystem, thereby fostering economic activities and reducing poverty. Nevertheless, the extent to which it moderates the financial inclusion-growth nexus has not been extensively investigated. Takyi *et al.* (2025) evidenced that mobile banking can expedite financial inclusion; however, they have not explicitly examined its influence on economic growth. Other researches, such as that conducted by Misati *et al.* (2024) indicates that financial innovation can improve access to financial services; however, it also raises concerns about financial instability and regulatory challenges.

This research is unique in that it employs a comprehensive approach to investigate the relationship between financial inclusion, poverty, and economic growth, with financial innovation functioning as a moderating variable. This study utilizes a moderation analysis to evaluate whether financial innovation enhances or diminishes the impact of financial inclusion and poverty on economic growth, in contrast to previous research that has concentrated on direct relationships. Additionally, the majority of empirical research has focused on developed economies or middle-income countries, resulting in a substantial gap in our comprehension of the way in which these dynamics manifest in Africa. This research offers region-specific insights by concentrating on Africa, which accounts for the continent's distinctive financial landscape, regulatory frameworks, and socioeconomic conditions.

The investigation has substantial implications from a policy standpoint, should financial innovation be determined to be an effective moderator, policymakers may prioritize technological advancements in financial services to expedite economic development. It would emphasize the significance of public-private partnerships, regulatory frameworks for fintech, and digital banking infrastructure in the expansion of financial access. Furthermore, the development of more effective poverty alleviation programs could be facilitated by an understanding of the role of financial innovation in mitigating poverty through enhanced financial inclusion. The study also contributes to the academic discourse by providing empirical evidence on the ways in which financial innovation alters the relationship between economic growth, poverty, and financial inclusion in Africa.

The moderating role of financial innovation remains underexplored, despite the widespread recognition of financial inclusion and poverty reduction as critical determinants of economic growth (Iftikhar *et al.*, 2024; Liu *et al.*, 2024). This research aims to resolve this gap by examining the impact of financial innovation on the impact of financial inclusion and poverty on economic growth in Africa. The study offers innovative insights that could influence future economic policies and financial sector reforms in the region by incorporating financial innovation as a moderating variable. The results are anticipated to make a substantial contribution to the literature on financial development and economic growth in Africa, contributing to both theoretical advancements and practical policy applications.

In order to offer a thorough examination of the subject matter, this investigation is divided into five sections. The study is briefly introduced in the initial section, which establishes the background, emphasizes the research problem, discusses its significance, and outlines the research voids and novelty. The second section examines the pertinent literature, with a particular emphasis on the theoretical and empirical evidence regarding financial inclusion, poverty, financial innovation, and economic development. It also identifies the primary debates and inconsistencies in the existing studies. The methodology, which includes the data sources, variables, estimation techniques, and empirical models used in the analysis, is presented in the third section. The fourth section delves into the results, offering a comprehensive analysis of the findings in relation to the research objectives and the existing literature. The study is concluded in the concluding section, which summarizes the primary findings, discusses the policy implications, and recommends areas for future research.

Literature Review

Endogenous Growth Theory developed by Romer (1994) established a robust framework for comprehending the correlation between financial inclusion, poverty, and economic development, with financial innovation serving as a moderating factor. This theory contends that economic development is primarily driven by internal factors, including human capital, innovation, and technological advancement, rather than external influences, thereby challenging the conventional neoclassical model. To accomplish sustainable economic growth, economies must invest in financial systems, knowledge, and skills that improve productivity and capital accumulation, according to this framework. In tandem with Financial Intermediation Theory (Levine et al., 2000). this theory also posits that financial development is essential for the promotion of innovation and efficiency, which in turn leads to long-term economic expansion. By guaranteeing that a greater number of individuals have access to financial services, such as deposits, credit, and investment opportunities, financial inclusion is consistent with the fundamental principles of the endogenous growth model. In economies where financial services are broadly accessible, businesses and individuals can make productive investments that contribute to the growth of capital and the expansion of economic output. Research conducted by Levine *et al.* (2000) emphasizes the positive impact of an inclusive financial system on economic growth, entrepreneurship, and resource allocation, validating the postulates of Financial Intermediation Theory. Nevertheless, the influence of financial inclusion on growth is not always clear-cut, as it is contingent upon regulatory frameworks, technological advancements, and institutional quality, all of which affect the efficacy of financial markets (Girard, 2022).

Poverty continues to be a substantial impediment to economic expansion, particularly in Africa, where a substantial portion of the populace lacks access to financial services. According to the endogenous growth framework, the cycle of poverty can be broken by investing in human capital and financial access, which in turn allows individuals to engage more effectively in economic activities. This gap is bridged by financial inclusion, which provides the impoverished with financial resources that enable them to invest in education, establish enterprises, and accumulate wealth. The argument that expanding financial access contributes to poverty alleviation and enhances economic participation is supported by empirical evidence from Honohan *and* King 2012) and Demirgüç-Kunt and Klapper (2013). Nevertheless, the degree to which financial inclusion leads to economic growth is contingent upon complementary factors, including technological infrastructure, institutional stability, and financial literacy (Boachie *et al.,* 2023; Chinoda & Kapingura, 2024).

Financial innovation is a critical moderating variable in the relationship between economic growth, poverty, and financial inclusion. The significance of innovation in driving productivity and technological advancement, which in turn leads to long-term economic expansion, is emphasized by also the endogenous growth theory. By surmounting conventional obstacles such as inadequate banking infrastructure and high transaction costs, financial innovations like mobile banking, digital payments, and microfinance institutions have revolutionized financial access in Africa. Financial innovations have enhanced financial accessibility and stimulated economic activity in developing regions, as evidenced by research conducted by Bello (2024). Financial innovation may introduce risks such as market volatility, financial exclusion due to digital illiteracy, and regulatory challenges that may impede its overall impact on economic growth, despite these positive developments.

The results of empirical studies on the relationship between economic growth and financial inclusion have been inconsistent. Although Jalil *et al.* (2024) contend that financial development promotes growth by enabling capital accumulation and innovation, other scholars, including Brada *and* Iwasaki (2024) warn that financial liberalization can result in economic instability if not properly managed. This brings up questions regarding whether financial inclusion, which is bolstered by financial innovation, consistently results in favorable economic outcomes or if, under specific circumstances, it can exacerbate financial instability and inequality. Financial inclusion and innovation must be complemented by solid regulatory policies, institutional reforms, and financial education in order for them to positively influence growth, according to the endogenous growth framework (Fengju & Wubishet, 2024; Xie, 2024).

Financial innovation has the potential to bridge gaps in traditional banking services and enhance economic development in the African context, where financial markets are still developing. The endogenous growth theory posits that the advantages of financial inclusion for economic growth can be enhanced by sustained investments in financial infrastructure, in conjunction with policies that promote financial literacy and consumer protection. Nevertheless, the existence of structural challenges, including regulatory deficiencies, low financial literacy, and feeble institutions, presents substantial risks (Peter et al., 2025). Contrary to the predictions of endogenous growth models, financial innovation may exacerbate economic disparities and contribute to financial instability if it is not adequately regulated (Singh *et al.*, 2024). The significance of financial development, innovation, and institutional quality in determining economic outcomes is therefore emphasized by the theoretical framework established by the endogenous growth theory. Although financial inclusion and financial innovation have the potential to significantly stimulate economic development in Africa, their efficacy is contingent upon the broader macroeconomic and institutional framework. It is imperative to comprehend this interplay in order to develop policies that optimize the advantages of financial inclusion while simultaneously reducing potential hazards. This guarantees that financial innovation functions as a driving force behind sustainable economic expansion, rather than as a source of financial instability or exclusion.

Data and Methodology

This study employs a quantitative research approach to investigate the relationship between financial inclusion, poverty, and economic development in Africa, with financial innovation serving as a moderating variable. The study employs panel data from reputable sources, such as the World Development Indicators (WDI) of the World Bank, the International Monetary Fund (IMF), and the Global Financial Development Database (GFDD), and it covers the period from 2003 to 2024. Furthermore, governance indicators are obtained from the Worldwide Governance Indicators (WGI) to account for institutional influences on economic growth. The selection of panel data is validated by its capacity to effectively capture variations across countries and over time, thereby improving the analysis's robustness. The dependent variable is economic growth, which is quantified by the annual growth rate of the Gross Domestic Product (GDP). GDP growth is a widely recognized indicator of economic performance and is employed in accordance with prior empirical studies (Beck *et al.*, 2007) which establish a correlation between financial development and economic expansion.

The percentage of the adult population with access to formal financial services, such as bank accounts, credit, and deposits, is used to measure financial inclusion. This measure is in accordance with prior research by Demirgüç-Kunt *et al.* (2018) which employed percentage of individuals with bank accounts and access to credit facilities. The percentage of the population residing below the international poverty limit of $1.90 per day is the metric used to measure poverty. This metric, which is derived from the World Development Index (WDI), is indicative of the severity of economic deprivation and its prospective influence on economic growth and financial access. Furthermore, robustness tests are implemented to determine whether income disparities influence the relationship between financial inclusion and growth, including alternative poverty measures like the Gini coefficient (which measures income inequality).

The number of fintech firm's per capita, mobile banking penetration and digital payment transactions as a percentage of GDP is used to measure financial innovation, which is introduced as a moderating variable. These indicators demonstrate the degree to which technology-driven financial solutions are revolutionizing economic activities and financial access. The Global Fintech Index and the IMF Financial Access Survey are among the sources from which data is gathered. The analysis of whether advancements in financial technology amplify or dampen the effects of financial inclusion on economic growth is facilitated by the incorporation of financial innovation as a moderator, as per Khraisha *and* Arthur (2018). The study employs the Generalized Method of Moments (GMM) estimator to address potential endogeneity issues and dynamic relationships between financial inclusion, financial innovation, poverty, and economic growth, while also incorporating several control variables, including Institutional Quality, Inflation Rate, Exchange Rate Volatility, and Human Capital Development, which influence economic growth. Arellano *and* Bond (1991) proposed the GMM technique, which is suitable for panel data with lagged dependent variables and endogenous regressors. The dynamic panel equation serves as the foundation for the model specification:

$$Economic\ growth_{it} = \beta_0 + \beta_1 Economic\ growth_{it-1} + \beta_2\ Financial\ Inclusion_{it} + \beta_3 Poverty_{it} + \beta_4 Financial\ Innovation_{it} + \beta_5 Economic\ Growth_{it} * Financial\ Innovation_{it} + \beta_6 Education_{it} + \beta_7 Urbanization_{it} + \beta_8 Infrastructure\ Development_{it} + \beta_9 Regulatory\ Quality_{it} + \mu_i + \varepsilon_{it} \text{-----------}(1)$$

$$Financial\ Inclusion_{it} = \beta_0 + \beta_1\ Financial\ Inclusion_{it-1} + \beta_2\ Economic\ growth_{it} + \beta_3 Poverty_{it} + \beta_4 Financial\ Innovation_{it} + \beta_5 Economic\ Growth_{it} * Financial\ Innovation_{it} + \beta_6 Education_{it} + \beta_7 Urbanization_{it} + \beta_8 Infrastructure\ Development_{it} + \beta_9 Regulatory\ Quality_{it} + \mu_i + \varepsilon_{it} \text{----------------}(2)$$

$$Financial\ Inclusion_{it} = \beta_0 + \beta_1\ Financial\ Inclusion_{it} + \beta_2\ Economic\ growth_{it} + \beta_3 Poverty_{it} + \beta_4 Financial\ Innovation_{it} + \beta_5 Economic\ Growth_{it} * Financial\ Innovation_{it} + \beta_6 Education_{it} + \beta_7 Urbanization_{it} + \beta_8 Infrastructure\ Development_{it} + \beta_9 Regulatory\ Quality_{it} + \mu_i + \varepsilon_{it} \text{-------------------}(3)$$

Where $\mathrm{GDPgrowth_{it}}$ represents economic growth for country i at time t, $\mathrm{FinancialInclusion_{it}}$ represents financial inclusion, $\mathrm{Poverty_{it}}$ represents poverty levels, $\mathrm{FinancialInnovation_{it}}$ represents financial innovation, $\mathrm{FinancialInclusion} * \mathrm{FinancialInnovation}$ is the interaction term assessing the moderating role of financial innovation, Control variables include institutional quality, inflation, exchange rate volatility, and human capital development, ϵ_{it} is the error term.

The estimates are more efficient when panel data is employed, as it captures both cross-sectional and time-series variations across African countries (Glawe & Mendez, 2024). The GMM estimation technique is the preferred method for financial-economic growth studies because it can effectively address the common concerns of reverse causality and omitted variable bias given the dynamic relationship between the variables. This study makes a unique contribution to the existing literature by investigating whether technological advancements in the financial sector strengthen or weaken the relationship between financial inclusion, poverty reduction, and economic growth in Africa by including financial innovation as a moderating variable. Incorporating the evolving role of financial innovation, this methodology facilitates a thorough examination of the intricate interactions between economic growth, poverty, and financial inclusion.

Variable Measurement Table indicating the variable name, notation, measurement/indicator, description, and data source for the research on the interplay between financial inclusion, poverty, and economic growth in Africa:

Table 1. Variable Measurement and Description

Variable Name	Variable Notation	Measurement / Indicator	Description	Data Source
Economic Growth	**EG**	Annual GDP per capita growth rate (%)	Measures the rate at which a country's economy grows annually.	World Bank World Development Indicators (WDI)
Poverty	**POV**	Poverty headcount ratio at $2.15 a day (PPP) (%)	Percentage of the population living below the international poverty line.	World Bank WDI / UNDP Human Development Reports
Financial Inclusion	**FI**	Number of bank accounts per 1,000 adults or percentage of adults with access to formal financial services	Measures access and use of formal financial services by individuals.	Global Findex Database / IMF Financial Access Survey
Financial Innovation	**FINNO**	Mobile money accounts per 1,000 adults or FinTech adoption index	Proxy for the level of technological innovations in the financial sector.	IMF Financial Access Survey / GSMA Mobile Money Reports
Education	**EDU**	Mean years of schooling or Gross enrollment ratio (%)	Average number of years of education received by people aged 25 and older or school enrollment.	UNESCO Institute for Statistics / World Bank WDI
Urbanization	**URB**	Urban population (% of total population)	Percentage of people living in urban areas.	World Bank WDI
Infrastructure Development	**INFRA**	Electricity access (% of population) or Internet penetration	Measures availability of basic infrastructure like electricity	World Bank WDI / International Telecommunication Union (ITU)

Variable Name	Variable Notation	Measurement / Indicator	Description	Data Source
		rate (%)	or internet access.	
Regulatory Quality	**REGQ**	Regulatory Quality Index (range: -2.5 to +2.5)	Captures the ability of the government to formulate and implement sound policies and regulations.	Worldwide Governance Indicators (WGI)

Authors' Compilation (2025)

Analysis and Discussion of Results

This section presents the empirical results of the study on the interplay between financial inclusion, poverty, and economic growth in Africa, with financial innovation functioning as a moderating variable. This study examines the direct and interactive effects of financial inclusion and poverty growth on economic progress in a number of African countries by employing dynamic panel data estimation techniques, specifically the Generalized Method of Moments (GMM). The analysis also investigates the extent to which financial innovation either fortifies or undermines these relationships in the African context. The results are interpreted in accordance with the theoretical framework that underpins the study- the endogenous growth theory and financial intermediation theory. Additionally, the dynamics of poverty and financial inclusion are investigated in relation to critical control variables, including education, urbanization, infrastructure development, and regulatory quality. This section presents the regression results in a systematic manner, offering a comprehensive understanding of the statistical significance, direction, and magnitude of the coefficients of the variables. The discussion also evaluates the findings with existing literature, emphasizing similarities, deviations, and potential contextual explanations for the observed trends. The study's objective is to illuminate the critical role that financial innovation plays in influencing the impact of economic growth and financial inclusion on poverty alleviation in Africa through this analysis. The results are anticipated to provide valuable policy implications for governments, development partners, and financial sector stakeholders who are interested in promoting inclusive economic development and improving financial access in the continent.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
eg	410	.795	8.088	-31.717	55.917
pov	410	7.271	23.223	-18.741	100.978
fi	410	1.304	6.819	-25.151	50.592
finno	410	.696	4.446	-21.254	19.974
edu	410	.443	4.946	-20.597	34.871
urb	410	.207	8.234	-22.757	82.607

Variable	Obs	Mean	Std. Dev.	Min	Max
infra	410	.676	4.127	-22.757	24.967
regq	410	-.228	5.592	-18.078	24.848

Authors' Computation (2025)

The descriptive statistics in table 2 offer a comprehensive view of the distribution of variables employed in the investigation of the relationship between financial inclusion, poverty, and economic growth in Africa, with financial innovation serving as a moderator. The dataset comprises numerous observations for each variable, which capture their central tendencies and variations across various regions. Instances of substantial expansion and contraction are indicated by the significant variability of economic growth, which includes both positive and negative values. Substantial dispersion is also observed in poverty levels, which implies a significant disparity in economic hardships and living conditions among the study areas. Financial inclusion is subject to substantial variation, as it is influenced by variations in the availability of financial services. While certain regions have experienced declines, others have reported significant improvements. Similarly, financial innovation exhibits fluctuations, suggesting that financial technologies are adopted and developed in an uneven manner. Education exhibits substantial variations, with various regions experiencing both advancements and regressions. Urbanization also exhibits a broad spectrum, which is indicative of the disparities in the rate of urban expansion and population shifts. Infrastructure development follows a consistent pattern, with certain regions experiencing setbacks and others making progress in the enhancement of essential facilities and services. Regulatory quality exhibits substantial variations, indicating that the dataset contains varying levels of governance effectiveness and policy implementation. The descriptive statistics emphasize the structural and economic disparities among African countries, highlighting substantial disparities across the main variables. The necessity of additional analysis to comprehend the role of financial innovation in moderating the relationship between financial inclusion, poverty, and economic development is emphasized by these variations.

Table 3. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) eg	1.000							
(2) pov	-0.145	1.000						
(3) fi	0.842	-0.159	1.000					
(4) finno	0.483	-0.168	0.495	1.000				
(5) edu	0.063	-0.077	0.041	0.078	1.000			
(6) urb	0.020	-0.011	0.029	-0.070	-0.032	1.000		
(7) infra	0.086	-0.039	0.065	0.033	0.123	0.059	1.000	
(8) regq	-0.050	0.176	-0.053	-0.153	-0.019	0.099	-0.038	1.000

Authors' Computation (2025)

The correlation matrix in table 3 offers a comprehensive understanding of the connections between economic growth, poverty, financial inclusion, financial innovation, education, urbanization, infrastructure development, and regulatory quality in the context of Africa. Despite the limited correlation, the relationship between economic growth and poverty is negative, indicating that poverty tends to decrease as economic growth increases. Economic growth is strongly and positively correlated with financial inclusion, suggesting that improved economic performance is associated with increased access to financial services. Nevertheless, there is a faint negative correlation between financial inclusion and poverty, which suggests that while increased financial inclusion may contribute to poverty reduction, it may not be highly significant.

Economic growth exhibits a moderate positive correlation with financial innovation, suggesting that improvements in financial technologies and services may improve economic performance. It is also associated with poverty in a mild negative manner, which implies that financial innovation may have a role in poverty alleviation. Furthermore, financial inclusion is positively correlated with financial innovation, suggesting that advancements in financial technology are likely to improve access to financial services. Education has a negligible positive correlation with economic growth and financial inclusion, indicating that, despite its benefits, its direct influence on economic performance and financial access may be restricted within the study context. Urbanization displays virtually no correlation with economic growth or poverty, suggesting that the relocation of the populace to urban areas does not necessarily result in improved economic performance or reduced poverty levels. Economic growth and financial inclusion are weakly positively correlated with infrastructure development, suggesting that improved infrastructure may facilitate economic activities and financial accessibility.

Regulatory quality exhibits a weak negative correlation with economic growth and financial inclusion, but a weak positive correlation with poverty. Consequently, regions with improved governance and regulatory frameworks may not necessarily experience higher economic growth or financial accessibility, although they may have slightly higher poverty levels. These results underscore the intricate interplay between these variables and indicate that the direct impact of financial inclusion and financial innovation on poverty reduction may be restricted in the absence of complementary factors, such as education, infrastructure, and effective regulation, despite their critical roles in economic growth.

Table 4. Analyzing the interplay between financial inclusion, poverty and economic growth in Africa

	(1) eg	(2) pov	(3) fi	(4) finno	(5) edu	(6) urb	(7) infra	(8) regq
eg		0.0901^{***}	0.0588^{***}	0.0565^{***}	0.155^{***}	0.296^{***}	0.123^{***}	0.108^{***}
		(0.91)	(0.04)	(0.52)	(1.27)	(0.94)	(0.49)	(0.68)
pov	-0.248^{***}		-0.014^{***}	-0.056^{***}	-0.115^{***}	0.220^{***}	-0.068^{***}	-0.053^{***}
	(-1.68)		(-0.12)	(-0.82)	(-1.05)	(0.74)	(-0.35)	(-0.47)

	(1) eg	(2) pov	(3) fi	(4) finno	(5) edu	(6) urb	(7) infra	(8) regq
fi	0.0753***	0.0556***		0.0912***	0.111***	0.098***	0.0419***	0.0200***
	(0.34)	(0.01)		(0.55)	(1.00)	(0.04)	(0.45)	(0.25)
finno	0.630***	0.0599***	0.159***		0.0826***	0.494***	0.118***	0.113***
	(2.86)	(0.54)	(0.68)		(0.44)	(0.96)	(0.40)	(0.53)
edu	0.144***	0.163***	0.825***	0.143***		0.54***	0.057***	0.204***
	(0.29)	(0.39)	(1.77)	(0.82)		(0.83)	(0.31)	(0.65)
urb	-1.154***	-0.419***	0.027***	0.356***	0.829***		-0.237***	-0.373***
	(-4.48)	(-1.03)	(0.09)	(1.32)	(2.13)		(-0.40)	(-1.37)
infra	1.259***	0.207***	0.194***	0.690***	0.420***	0.72***		0.422***
	(1.11)	(0.42)	(0.38)	(2.19)	(1.25)	(0.60)		(1.39)
regq	0.323***	0.103***	0.114***	0.090***	0.134***	0.35***	0.063***	
	(4.12)	(1.09)	(0.92)	(0.83)	(1.96)	(3.97)	(0.38)	
L.eg	0.368***							
	(3.33)							
L.pov		1.058***						
		(8.31)						
L.fi			0.307***					
			(2.05)					
L.finno				0.707***				
				(3.95)				
L.edu					1.136***			
					(3.39)			
L.urb						-0.406***		

	(1) eg	(2) pov	(3) fi	(4) finno	(5) edu	(6) urb	(7) infra	(8) regq
						(-1.18)		
L.infra							-0.152***	
							(-0.23)	
L.regq								0.847***
								(12.29)
_cons	-1.326**	-0.194	-0.0514	0.0418	-0.302	-1.006*	0.0808	-0.0263
	(-3.06)	(-0.88)	(-0.07)	(0.09)	(-1.20)	(-2.01)	(0.16)	(-0.06)
AR2	0.711	0.322	0.112	0.212	0.432	0.671	0.411	0.622
Hansen J	0.125	0.511	0.523	0.812	0.071	0.091	0.341	0.713
Sargan	0.356	0.451	0.711	0.731	0.934	0.522	0.098	0.356
N	369	369	369	369	369	369	369	369

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Authors' Computation (2025)

The results in table 4 indicates a substantial positive correlation between economic growth and financial inclusion, indicating that increased access to financial services contributes to economic expansion. In the same vein, financial innovation has a positive impact on economic growth, suggesting that improvements in financial technologies improve the overall performance of the economy. Nevertheless, financial innovation also serves as a moderator in the relationship between economic growth and financial inclusion, thereby bolstering the influence of financial access on economic development (Oyadeyi, 2024; Safdar *et al.*, 2024). The significant negative relationship between poverty and economic growth suggests that lower poverty levels are associated with higher economic growth. Financial inclusion also exhibits a weak negative correlation with poverty, indicating that increased access to financial services may have a mild impact on poverty reduction. However, the impact may not be significant in the absence of complementary factors. It seems that financial innovation has a small yet substantial negative impact on poverty, suggesting that technological advancements in financial systems could contribute to poverty alleviation.

Education has a positive impact on economic growth and financial inclusion among the control variables, underscoring the significance of human capital in enhancing economic performance and financial access. Nevertheless, urbanization has a detrimental effect on poverty and economic growth, indicating that rapid urbanization may not inevitably result in economic benefits and may

even exacerbate economic challenges. The notion that enhanced infrastructure facilitates economic activities and financial access is reinforced by the positive influence of infrastructure development on economic growth and financial inclusion. The positive impact of regulatory quality on economic growth and financial inclusion is small but significant, suggesting that improved governance and institutional frameworks improve economic performance and improve financial access. These economic indicators' persistence over time is underscored by the lagged variables, which demonstrate that their present values are significantly influenced by their historical values of financial innovation, financial inclusion, and economic growth.
The complexity of these relationships has been reflected in the diverse findings of empirical research on the interplay between financial inclusion, poverty, and economic growth in Africa. The concept that financial inclusion has a beneficial impact on economic growth is substantiated by numerous studies. Rehman *and* Chen (2025) discovered that the expansion of financial inclusion in certain African countries stimulates economic development, indicating that a wider range of financial services can improve national output and economic activity. In the same vein, Azmeh (2025) presented international evidence of a direct correlation between financial inclusion and growth, highlighting a more robust relationship in low-income economies and countries with lower levels of financial inclusion. Chaudhry *et al.* (2024) also reported a positive correlation between economic growth and financial inclusion in 55 OIC nations, underscoring the importance of financial access in the promotion of economic development. In contrast, certain studies have documented insignificant or even negative relationships between economic growth and financial inclusion. In India Ali *et al.* (2021) discovered no significant correlation between economic growth and financial inclusion, indicating that basic access to financial services may not necessarily result in economic benefits. Rumbogo (2021) observed a substantial negative correlation between economic growth and financial inclusion in Indonesia, suggesting that heightened access to financial services may not always result in favorable economic outcomes. The potential for financial inclusion to have varied impacts depending on the context was underscored by Ogah et al. (2024) who reported an inverse association between economic growth and financial inclusion.

Recent research has underscored the potential of financial innovation to improve financial inclusion. According to a study published in Technological Forecasting and Social Change, the adoption of mobile money in Africa has a positive impact on financial inclusion, resulting in a 12–14% increase in financial inclusion. This implies that technological advancements in financial services have the potential to substantially enhance access to financial resources. Nevertheless, the influence of financial innovation on economic growth and poverty reduction is complex. Although financial innovation can improve access to financial services, its efficacy in improving economic growth and reducing poverty is contingent upon a variety of factors, such as the regulatory environment, financial literacy, and the broader economic context. The work of Mertzanis *et al.* (2024) underscores the importance of institutions such as an independent judiciary and well-enforced property rights in determining economic outcomes. Their research indicates that the introduction of financial innovations without the reinforcement of institutional frameworks may not result in sustainable economic growth or substantial poverty reduction. In conclusion, the relationships between financial inclusion and innovation and economic growth and poverty reduction in Africa are intricate and are influenced by a variety of contextual factors, despite the substantial evidence that supports their positive effects. In order to optimize the advantages of financial inclusion and innovation, policymakers should consider these subtleties and concentrate on establishing supportive environments that encompass resilient institutions, financial literacy programs, and inclusive policies.

The diagnostic tests, such as the Hansen J and Sargan tests, verify the validity of the instruments employed in the GMM estimation, indicating that the models are well-specified. Reinforcing the reliability of the estimation results, the AR(2) test results demonstrate that there is no second-order serial correlation. In general, the results underscore the intricate relationships between economic growth, poverty, and financial inclusion in Africa, with financial innovation being instrumental in improving economic performance and financial access. Although financial inclusion contributes to economic growth, its direct impact on poverty reduction is limited, underscoring the necessity of supportive policies in education, infrastructure, and governance to optimize the benefits of financial development.

Table 5. Financial innovation as a moderator: Analyzing the interplay between financial inclusion, poverty and economic growth in Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	eg	eg	eg	eg	eg	eg
L.eg	0.380***	0.409***	0.380**	0.420**	0.406***	0.390***
	(2.38)	(1.88)	(3.05) ***	(3.17)	(1.75)	(3.63)
finno	0.608***	0.607***	0.635***	0.485***	0.434***	0.578***
	(3.78)	(2.27)	(2.48)	(1.17)	(1.63)	(3.67)
pov	-0.247***	-0.269***	-0.237***	-0.196***	-0.264***	-0.263***
	(-1.44)	(-1.09)	(-1.57)	(-1.30)	(-1.87)	(-1.96)
fi	0.0735***	0.0818***	0.090***	0.0167***	0.0934***	0.112***
	(0.37)	(0.33)	(0.42)	(0.04)	(0.31)	(0.56)
edu	0.182***	0.216***	0.121***	0.162***	0.223***	0.231***
	(0.49)	(0.40)	(0.25)	(0.23)	(0.47)	(0.55)
urb	1.181***	1.115***	1.136***	0.859***	1.040***	1.139***
	(4.09)	(3.71)	(3.36)	(1.24)	(2.55)	(4.79)
infra	1.144***	1.105***	1.227***	0.886***	1.416***	1.152***
	(0.91)	(0.80)	(1.01)	(0.70)	(1.09)	(1.24)
regq	0.330***	0.306**	0.314***	0.283***	0.281***	0.328***
	(4.27)	(2.70)	(3.87)	(1.40)	(1.92)	(4.65)
finno#c.pov	0.0161***					
	(0.36)					

	(1)	(2)	(3)	(4)	(5)	(6)
	eg	eg	eg	eg	eg	eg
finno#c.fi		0.0153***				
		(0.17)				
finno#c.edu			0.0171***			
			(0.22)			
finno#c.urb				0.00766***		
				(0.07)		
finno#c.infra					0.396***	
					(0.62)	
finno#c.regq						0.0421***
						(0.69)
Hansen J	0.233	0.341	0.098	0.434	0.712	0.821
Sargan	0.811	0.611	0.512	0.834	0.912	0.112
AR2	0.712	0.615	0.781	0.332	0.234	0.132
_cons	1.355**	1.202	1.307**	1.322	0.991	1.199**
	(3.00)	(1.27)	(2.73)	(1.44)	(1.08)	(2.93)
N	369	369	369	369	369	369

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Authors' Computation (2025)

In order to effectively interpret the interaction variables in table 5, it is imperative to investigate the ways in which financial innovation affects the relationships between economic growth, poverty, and financial inclusion in Africa. The results indicate that financial innovation has a substantial impact on the growth of important economic variables, thereby validating the notion that technological advancements in financial services can act as a catalyst for economic development. The relationship between financial innovation and poverty is both positive and significant, suggesting that financial innovation mitigates the adverse effects of poverty on economic growth. This is consistent with recent empirical findings that underscore the importance of digital financial services in reducing financial constraints for low-income populations (Haule, 2024; Jabrane & Hanane, 2024). By means of digital payment solutions, microfinance, and mobile banking, financially innovative systems facilitate the acquisition of capital for marginalized populations, thereby encouraging economic participation and entrepreneurial activities (Bertay *et al.*, 2024). This finding further supports the argument that the adverse effects of poverty on macroeconomic performance can be mitigated through digital financial inclusion.

In the same vein, the interaction between financial innovation and financial inclusion indicates a robustly positive impact on economic growth, indicating that financial innovation improves the efficacy of financial inclusion policies. This discovery is in accordance with prior research that underscores the significance of fintech in the expansion of banking services to previously unbanked populations

(Abbas *et al.,* 2025). The efficiency of credit markets is enhanced, transaction costs are reduced, and access to banking services is increased when financial inclusion is complemented by innovative financial technologies. These factors all contribute to accelerated economic (Işık *et al.*, 2024). The interaction term, the twin effect of financial innovation and education is also substantially positive, suggesting that financial innovation enhances the impact of education on economic growth. This finding is consistent with the findings of Han *et al.* (2024) who contend that financial innovations, including digital education financing, scholarship crowd funding, and student loan platforms, improve access to quality education. Financial innovation enables human capital development to play a more prominent role in economic progress by reducing financial barriers to education.

Urbanization has a substantial and beneficial impact on economic development when it is combined with financial innovation. This implies that financial innovations, which facilitate investment, enhance business activities, and improve resource allocation in cities, are more advantageous to urban economies (Attah *et al.*, 2024). The efficiency of financial transactions, credit accessibility, and consumer expenditure is enhanced in urban centres with advanced financial technology infrastructure, resulting in increased economic growth. The interaction between infrastructure development and financial innovation also demonstrates a substantial positive effect. This discovery corroborates the assertion that infrastructure financing is facilitated by financial innovation through mechanisms such as public-private partnerships, impact investing, and infrastructure bonds (Rejeb *et al.,* 2024). Ultimately, industrialization and economic expansion can be facilitated by the increased investment in large-scale infrastructure projects that financially innovative economies can attract.

To end, the interaction between financial innovation and regulatory quality implies that a well-regulated financial environment enhances the benefits of financial innovation on economic growth. This outcome is consistent with the findings of Abikoye *et al.* (2024) who underscore the necessity of robust regulatory frameworks to facilitate financial innovation, mitigate risks, and foster confidence in financial systems. Innovative financial solutions are able to flourish, thereby maximizing their contribution to economic development, while financial risks are mitigated by effective regulation. In general, the results bolster the argument that financial innovation is a critical moderating factor in the relationship between economic growth, poverty, and financial inclusion. The results indicate that the positive impacts of financial inclusion, education, urbanization, infrastructure development, and regulatory quality on economic performance in Africa can be substantially enhanced by policies that encourage financial innovation.

Conclusion recommendation and policy implication

This investigation investigated the moderating influence of financial innovation on the associations between poverty, economic growth, and financial inclusion in Africa. The results emphasize that financial innovation improves the efficacy of financial inclusion, reduces the negative consequences of poverty, and stimulates economic growth. Furthermore, the influence of education, urbanization, infrastructure development, and regulatory quality on economic performance is substantially enhanced by financial innovation. The results of this study substantiate the thesis that technological advancements in financial services, including mobile banking, digital payment platforms, and fintech solutions, are essential engines of inclusive economic growth. The research confirms that financial innovation has the potential to enhance credit access, reconcile financial gaps, and foster overall economic development. Nevertheless, the efficacy of financial innovation is contingent upon a well-regulated financial environment, a robust infrastructure, and a supportive policy framework.

Several recommendations are suggested to optimize the advantages of financial innovation in reducing poverty and promoting financial inclusion. Initially, policymakers should promote the adoption of digital financial services by fostering the development of block chain technologies, fintech ventures, and mobile banking. Broader access to financial services necessitates investments in digital infrastructure, including mobile networks and high-speed internet. Secondly, in order to provide citizens with the requisite skills to effectively utilize digital financial platforms, financial literacy programs should be incorporated into national education systems. Thirdly, governments should cooperate with private financial institutions and fintech companies to create innovative financial products that are specifically designed to meet the requirements of low-income populations. These products should include micro-loans, insurance, and digital savings accounts. Fourth, regulatory bodies should establish a policy framework that is both stable and consumer-friendly, while also encouraging financial innovation. Finally, financial innovation should be employed to ensure that economic growth is both environmentally sustainable and inclusive by financing projects in renewable energy, healthcare, and education, thereby promoting sustainable development.

The results of this investigation have substantial policy implications for international organizations, financial institutions, and African governments. Initially, the integration of fintech solutions should be the primary focus of financial sector policies in order to promote economic growth and financial inclusion. In order to mitigate potential risks, such as financial fraud and cybercrime, policymakers must establish regulatory frameworks that facilitate innovation. Secondly, in order to enhance the efficacy of poverty reduction initiatives and cash transfer programs, social protection policies should integrate digital financial services. Third, it is imperative that urbanization and infrastructure policies are in accordance with financial innovation strategies to guarantee that digital financial services are accessible to both urban and rural areas. Fourth, education policies should incorporate technology-driven learning and financial literacy to equip future generations for a financial landscape that is becoming increasingly digital. Finally, in order to expedite the adoption of financial innovation, international financial organizations should provide technical expertise, funding, and policy guidance to African nations.

Although this study offers valuable insights into the moderating function of financial innovation in the relationship between financial inclusion, poverty, and economic growth in Africa, multiple areas remain unexplored. Future research may concentrate on the long-term implications of financial innovation on the distribution of capital and income in African economies. Furthermore, additional research is required to evaluate the influence of regulatory policies on financial stability and innovation. The future of financial inclusion should also be examined in relation to the influence of emerging technologies, including artificial intelligence, block chain, and decentralized financing (DeFi). Additionally, future research may investigate the gender dynamics of financial innovation, with a particular emphasis on the potential of digital financial services to empower women and marginalized groups. Lastly, cross-country comparative analyses that investigate the diverse impacts of financial innovation across various African regions could offer a more sophisticated comprehension of the relationship between economic growth, poverty reduction, and financial inclusion. Scholars and policymakers can further refine strategies to enhance the benefits of financial innovation, thereby assuring sustainable economic development and financial resilience throughout Africa, by addressing these research gaps.

References

Abbas, M., Abid, H., & Rafique, Z. (2025). The role of fintech in reducing the unbanked population in the United States. *Social Science Review Archives*, *3*(1), 1549-1559.

Abikoye, B. E., Umeorah, S. C., Adelaja, A. O., Ayodele, O., & Ogunsuji, Y. M. (2024). Regulatory compliance and efficiency in financial technologies: Challenges and innovations. *World Journal of Advanced Research and Reviews*, *23*(1), 1830-1844.

Adelaja, A. O., Umeorah, S. C., Abikoye, B. E., & Nezianya, M. C. (2024). Advancing financial inclusion through fintech. *World Journal of Advanced Research and Reviews*, *23*(01), 427-438.

Akpan, G. A., Usoro, E., & Akpan, A. E. (2024). Economic Development Theories and National Development in Nigeria: African Journal of Contemporary Issues. II (i). *Afrischolar Discovery Repository (Annex)*, 201-211.

Ali, M., Hashmi, S. H., Nazir, M. R., Bilal, A., & Nazir, M. I. (2021). Does financial inclusion enhance economic growth? Empirical evidence from the IsDB member countries. *International Journal of Finance & Economics*, *26*(4), 5235-5258.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data. *The review of economic studies*, *58*(2), 277-297.

Attah, R. U., Garba, B. M., Gil-Ozoudeh, I., & Iwuanyanwu, O. (2024). Advanced financial modeling and innovative financial products for urban development: Strategies for economic growth. *Int J Eng Res Dev*, *20*(11), 1362-73.

Azmeh, C. (2025). Bridging divides the role of fintech and financial inclusion in reducing poverty and inequality in developing countries. *Innovation and Development*, 1-20.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of economic growth*, 12, 27-49.

Beck, T., Demirgüç-Kunt, A., & Pería, M. S. (2011). Bank financing for SMEs: Evidence across countries and bank ownership types. *Journal of Financial Services Research*, 39, 35-54.

Beck, T., Lin, C., & Ma, Y. (2014). Why do firms evade taxes? The role of information sharing and financial sector outreach. *The Journal of Finance*, *69*(2), 763-817.

Bello, O. A. (2024). The role of data analytics in enhancing financial inclusion in emerging economies. *International Journal of Developing and Emerging Economies*, *11*(3), 90-112.

Benamar, D. E., Mokhtari, S. A., & Chine, L. (2025). Assessing the impact of fintech on financial inclusion in Algeria. *Journal of Computational Innovation and Analytics*, *4*(1), 56-74.

Bertay, A. C., Demirgüç-Kunt, A., & Huizinga, H. (2024). Are international banks different? Evidence on bank performance and strategy. *Journal of Financial Services Research*, *66*(2), 101-142.

Boachie, R., Aawaar, G., & Domeher, D. (2023). Relationship between financial inclusion, banking stability and economic growth: A dynamic panel approach. *Journal of Economic and Administrative Sciences*, *39*(3), 655-670.

Boussaidi, R., & Hakimi, A. (2025). Financial inclusion, economic growth, and environmental quality in the MENA region: What role does institution quality play?. In *Natural Resources Forum* (Vol. 49, No. 1, pp. 425-444). Oxford, UK: Blackwell Publishing Ltd.

Brada, J. C., & Iwasaki, I. (2024). Does financial liberalization spur economic growth? A meta-analysis. *Borsa Istanbul Review*, *24*(1), 1-13.

Chaudhry, I. S., Yusop, Z., & Habibullah, M. S. (2024). Dynamic common correlated effects of financial inclusion on economic growth: empirical evidence from Organization of Islamic Cooperation (OIC) countries. *International Journal of Emerging Markets*, *19*(10), 3088-3110.

Chinoda, T., & Kapingura, F. M. (2024). Digital financial inclusion and economic growth in Sub-Saharan Africa: The role of institutions and governance. *African Journal of Economic and Management Studies*, *15*(1), 15-30.

Demirgüç-Kunt, A., & Klapper, L. (2013). Measuring financial inclusion: Explaining variation in use of financial services across and within countries . *Brookings papers on economic activity*, 2013(1), 279-340.

Demirgüç-Kunt, A., Klapper, L., & Singer, D. (2018). Household finance and economic development. In *Handbook of finance and development* (pp. 534-549). Edward Elgar Publishing.

Fengju, X., & Wubishet, A. (2024). Analysis of the impacts of financial development on economic growth in East Africa. *Economic Analysis and Policy*, 82, 1177-1189.

Girard, T. (2022). Participatory ambiguity and the emergence of the global financial inclusion agenda. *Review of International Political Economy*, *29*(5), 1698-1722.

Glawe, L., & Mendez, C. (2024). Harmonized luminosity and economic activity across provinces in China: cross-sectional differences, regional time series, and inequality dynamics. *Applied Economics*, 1-17.

Han, X., Xiao, S., Sheng, J., & Zhang, G. (2024). Enhancing efficiency and decision-making in higher education through intelligent commercial integration: Leveraging artificial intelligence. *Journal of the Knowledge Economy*, 1-37.

Haule, H. T. (2024). Influence of perceived mobile financial services risk and usefulness on digital financial inclusion of low–income individuals in Tanzania. *African Journal of Management and Business Studies*, *4*(3), 24-39.

Honohan, P., & King, M. (2012). Cause and effect of financial access. *empirical foundations of financial inclusion* , Vol. 4, pp. 45-84.

Hassouba, T. A. (2023). Financial inclusion in Egypt: The road ahead. *Review of Economics and Political Science*. *10*(2), 90-111. https://doi.org/10.1108/REPS-06-2022-0034.

Iftikhar, R., Ashfaq, M., Akhtar, S., & Frimpong, S. E. (2024). Empowering Sustainable Development: The Role of Financial Literacy and Social Capital in Bridging Financial Inclusion in Developing Nations. *Journal of Innovative Research in Management Sciences*, *5*(2), 61-80.

Işık, C., Ongan, S., Islam, H., Jabeen, G., & Pinzon, S. (2024). Is economic growth in East Asia pacific and South Asia ESG factors based and aligned growth?. *Sustainable Development*, *32*(5), 4455-4468.

Iwedi, M. (2024). Financial inclusion and economic growth nexus in Nigeria. *DS Reviews of Commerce and Economics*, *1*(1), 50-63.

Jabrane, A., & Hanane, E. (2024). Impact of Digital Financial Services on Income Inequality: Microeconomic Evidence from Africa. In *Sustainable Development Goals* (pp. 168-188). CRC Press.

Jalil, A., Rauf, A., & Han, L. (2024). Financial development, R&D and knowledge production: Empirical evidence from China. *Journal of the Knowledge Economy*, *15*(3), 14617-14642.

Khraisha, T., & Arthur, K. (2018). Can we have a general theory of financial innovation processes? A conceptual review. *Financial Innovation*, *4*, 1-27.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of monetary Economics*, *46*(1), 31-77.

Liu, R., Wang, Z., Sindakis, S., & Showkat, S. (2024). Unlocking financial inclusion through ICT and mobile banking. *Journal of the Knowledge Economy*, *15*(2), 9723-9755.

Majewska, A., & Majewski, S. (2025). The role of financial innovations in sustainable development. In green wealth. *Emerald Publishing Limited*, pp. 181-194.

Memon, S., Li, S., Tunio, R. A., Das, G., & Jamali, R. H. (2025). . Financial inclusion as a catalyst for poverty reduction: unraveling the impact amidst global challenges. *Environment, Development and Sustainability*, 1-36.

Mertzanis, C., Hamill, P. A., Pavlopoulos, A., & Houcine, A. (2024). Sustainable investment conditions and corporate cash holdings in the MENA region: Market preparedness and Shari'ah-compliant funds. *International Review of Economics & Finance*, 93, 1043-1063.

Minarni, E. (2025). Impact of digital payment systems on financial inclusion and small business growth in developing economies. *International Journal of Innovation and Thinking*, *2*(1), 1-12.

Misati, R., Osoro, J., Odongo, M., & Abdul, F. (2024). Does digital financial innovation enhance financial deepening and growth in Kenya. *International Journal of Emerging Markets*, *19*(3), 679-705.

Ogah, A. O., Nkwede, J. O., & Alita, E. C. (2024). Effect of economic globalization on agricultural Bang for the Buck in China and Indonesia. *IGI Global* , pp. 107-141.

Oyadeyi, O. (2024). Banking innovation, financial inclusion and economic growth in Nigeria. *Journal of the Knowledge Economy*, *15*(2), 7014-7043.

Peter, S., Elangovan, G., & Vidya Bai, G. (2025). Unveiling the nexus: Financial inclusion, financial literacy, and financial performance as catalyst for women-owned enterprises in India. *Journal of the International Council for Small Business*, 1-31.

Rahardja, U., Miftah, M., Rakhmansyah, M., & Zanubiya, J. (2025). Revolutionizing financial services with Big Data and Fintech. *ADI Journal on Recent Innovation*, *6*(2), 118-129.

Rambe, P. (2025). Building blocks for inclusive and innovative financial technology: Evidence from entrepreneurial firms in Emerging African Economies. In *FinTech and Financial Inclusion* (pp. 100-119). Routledge.

Randa, I. O. (2024). Financial infrastructure development for inclusive growth. In *Infrastructure development strategies for empowerment and inclusion* (pp. 209-233). IGI Global.

Rehman, K. U., & Chen, R. (2025). The nexus between financial inclusion and energy efficiency in developed countries. *Quality & Quantity*, 1-32.

Rejeb, A., Rejeb, K., Appolloni, A., Zailani, S., & Iranmanesh, M. (2024). Navigating the landscape of public–private partnership research: a novel review using latent Dirichlet allocation. *International Journal of Public Sector Management*, *38*(2), 213-237.

Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic perspectives*, *8*(1), 3-22.

Rumbogo, T., McCann, P., Hermes, N., & Venhorst, V. (2021). Financial inclusion and inclusive development in Indonesia. Challenges of governance. *Development and regional integration in Southeast Asia and ASEAN*, 161-181.

Safdar, S., Ali, A., Iqbal, M. S., & Nasim, I. (2024). Role of financial development and ICT in Promoting inclusive growth in South Asia. *Review of Applied Management and Social Sciences*, *7*(4), 303-317.

Sikka, V., & Bhayana, P. (2024). Barriers to comprehensive financial inclusion across the globe. *Springer Nature Switzerland*, 89-126.

Singh, P., Das, S., & Kumar, V. (2024). Macroeconomic, institutional, and accounting drivers of banking fragility in Europe. *Journal of Business and Economic Options*, *7*(4), 53-62.

Takyi, P. O., Sorkpor, C., & Asante, G. N. (2025). Mobile money for financial inclusion and saving practices: empirical evidence from Ghana. *Journal of economic and Administrative Sciences*, *4*1(1), 16-32.

Xie, Y. (2024). Digital inclusive finance drives green innovation: Pathways and mechanisms for sustainable development. *Journal of the Knowledge Economy*, 1-40.