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FINANCIAL INCLUSION AND POVERTY REDUCTION AMONG SMALL AND MEDIUM ENTERPRISES IN TANZANIA: MODERATING ROLE OF DIGITAL CAPABILITY

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Abstract. The study examined the impact of financial inclusion on poverty reduction among small and medium-sized enterprise (SME) owners in Tanzania. Specifically, its purpose was to evaluate the effects of access to financial institutions, savings accounts, loan services, and automated teller machines (ATMs) on poverty alleviation outcomes. Additionally, the study has investigated the moderating role of digital capabilities–including digital infrastructure, information management, analytics, operational efficiency, and transformational capacity–in clarifying the relationship between financial inclusion and poverty reduction. The study adopted a cross-sectional explanatory research design grounded in a deductive approach and employed survey techniques for data collection. The multistage, stratified, and simple random sampling procedure was used to select a sample of 381 SME owners across five regions: Dar es Salaam, Mwanza, Arusha, Mbeya, and Mtwara. Primary data were collected using a structured questionnaire. The collected data were analyzed using descriptive statistics, Ordinary Least Squares (OLS) regression, and hierarchical regression analysis.

Findings: Financial inclusion–measured by access to financial institutions, savings accounts, loan services, and ATMs–had a positive and statistically significant effect on poverty reduction among SME owners. Furthermore, digital capabilities were found to play a positive and significant moderating role in the relationship between financial inclusion and poverty reduction, strengthening the observed effects. However, among the financial inclusion components, only savings accounts demonstrated significant interaction effects with digital capabilities.

Practical Implication: Owners of SMEs are encouraged to increase their use of savings accounts, loan services, and ATMs to enhance the effectiveness of financial inclusion initiatives in achieving poverty-reduction outcomes. Policymakers should strengthen financial inclusion by promoting the accessibility, availability, and reliability of financial institutions and related financial services, including savings accounts, loan facilities, and ATMs. Furthermore, both SME owners and financial institutions should prioritize the development and integration of digital capabilities to improve the efficiency and overall impact of financial inclusion strategies in alleviating poverty.

Social Implications: Society should actively promote and utilize the key components of financial inclusion–namely, financial institutions, savings accounts, loan services, and ATMs–as mechanisms to advance poverty reduction efforts. Moreover, the adoption and use of digital financial services should be encouraged to further enhance the effectiveness of financial inclusion in alleviating poverty among SME owners in Tanzania.

Originality: This study is the first to integrate Technology Acceptance Theory with Financial Intermediation Theory to provide a comprehensive explanation of how financial inclusion and digital capabilities jointly contribute to poverty reduction in developing countries.

Key words: financial inclusion, financial institutions, savings accounts, loan services, Automated Teller Machines (ATMs), Digital Capability, Poverty reduction, Tanzania.

JEL Classification: G21, O16, L26, O55.

INTRODUCTION

Small and Medium Enterprises (SMEs) are widely recognized as key drivers of innovation, employment generation, and economic resilience in developing economies (Nor, 2024). In Tanzania, SMEs account for over 90 percent of registered businesses and contribute approximately 30–35 percent of Gross Domestic Product (GDP), underscoring their importance to inclusive economic growth (World Bank, 2022; Bank of Tanzania (BoT, 2024). Despite their economic significance, many SMEs continue to face persistent constraints in accessing and effectively utilizing formal financial services, limiting their contribution to poverty reduction and long-term development (Asah et al., 2025).

Empirical evidence indicates that access to formal credit among Tanzanian SMEs remains low, with fewer than 30 percent obtaining financing from regulated financial institutions (World Bank, 2022). Although the expansion of mobile money and digital financial services has improved transactional access, uptake of more advanced financial products, such as credit, insurance, and long-term savings, remains limited, particularly among micro and small enterprises (Demirgüç-Kunt et al., 2022). These patterns suggest that access alone may be insufficient to translate financial inclusion into meaningful welfare gains. Financial inclusion involves the availability and use of affordable, relevant, and sustainable financial services by individuals and businesses (World Bank, 2022).

In Tanzania, access to financial services has expanded considerably over the past decade (Lotto, 2022). The proportion of adults using formal financial services increased from 65 percent in 2017 to 76 percent in 2023, largely driven by mobile money platforms such as M-Pesa, Airtel Money, Mixx by YAS, and Halopesa (UNCDF, 2024). To consolidate these gains, the government launched the Third National Financial Inclusion Framework (NFIF III, 2023–2028), which aims to increase financial inclusion to 85 percent by 2028, with a particular focus on underserved groups, including SMEs, women, youth, and rural populations (UNCDF, 2024).

While a majority of adults have access to financial services, only about 22 percent maintain bank accounts, and participation in insurance and pension schemes remains below 10 percent (IMF, 2024; BoT, 2024). SMEs operating in rural areas and less-developed regions limit owners' capacity to expand, generate income, and reduce poverty (Malombe, 2025).

The existing literature on financial inclusion in Africa has largely focused on individual-level outcomes or macroeconomic indicators, such as economic growth and financial sector development (Demirgüç-Kunt et al., 2018; IMF, 2024). Firm-level studies linking financial inclusion to poverty reduction outcomes, particularly among SMEs, remain limited. Furthermore, few studies explicitly examine the role of digital capability in shaping SMEs' performance. This represents an important empirical and theoretical gap, especially in developing economies where financial markets are evolving rapidly.

SMEs are widely acknowledged as engines of inclusive growth and structural transformation; however, their contribution to poverty reduction depends not only on access to finance but also on the capability to manage and deploy financial resources effectively (Liu et al., 2023). In Tanzania, approximately 40 percent of SMEs identify access to finance as their primary operational constraint (World Bank, 2022).

Despite Sub-Saharan African countries having achieved digital financial inclusion, many SMEs still struggle to align financial inclusion with income growth and poverty alleviation (Umar et al., 2025). The empirical literature indicates that few studies have examined the link between financial inclusion and poverty reduction in developing countries, including Tanzania (Jungo et al., 2022). Moreover, despite studies such as Ferreira et al. (2024) and Sherani et al. (2025), which document the influence of digital capability on poverty reduction, there remains a gap in understanding how digital capability moderates the relationship between financial inclusion and poverty reduction in developing countries such as Tanzania. To address these gaps, this study examines the influence of multidimensional financial inclusion, including financial institutions, savings accounts, loan services, and automated teller machines, on poverty reduction. The Digital capability is used as the moderating variable.

LITERATURE REVIEW

1 Theoretical Framework

This study is anchored in two theories.

1.1 Financial Intermediation Theory

Financial Intermediation Theory was developed by Gurley and Shaw (1960) to explain the role of financial intermediaries in addressing market imperfections within the financial system. The theory is grounded in the concepts of agency problems and information asymmetry, which arise when borrowers and lenders possess unequal information (Grassi et al., 2022). These imperfections result in high transaction costs, limited access to credit, and inefficient allocation of financial resources. According to the theory, financial intermediaries exist to reduce transaction costs, improve information flow, and facilitate access to financial services (Gbadebo, 2024). Through improved access to financial services, including microcredit and digital financial services, intermediaries enhance financial efficiency and promote economic activity (Olufemi et al., 2024).

In this study, financial intermediation theory provides a strong foundation for examining the relationship between financial inclusion and poverty reduction among small and medium-sized enterprises (SMEs). The theory explains how micro-savings, micro-credit, micro-insurance, and digital banking function as intermediary mechanisms that connect SMEs to financial resources. Microcredit enables SMEs to overcome credit constraints and finance business expansion, while micro-savings enhance capital accumulation and liquidity management (Rupa & Parimalarani, 2025). Micro-insurance reduces business vulnerability to financial shocks, thereby supporting continuity and stability (Lesar & Iriani, 2024). By facilitating access to affordable and appropriate financial services, financial intermediaries enhance SMEs' capacity to invest, manage risks, and improve productivity (Zulqarnain et al., 2023). Therefore, financial intermediation theory directly supports the study's independent variables (micro-savings, micro-credit, and digital financial services) and explains their expected influence on the dependent variable, namely, the reduction of poverty among SMEs.

1.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), explains how users come to accept and use new technologies. The model identifies perceived usefulness and perceived ease of use as the primary determinant of technology adoption. Perceived usefulness refers to the extent to which a user believes that a technology enhances performance, while perceived ease of use relates to the degree to which the technology is considered effortless to operate. TAM assumes that individuals and organizations make rational decisions based on their evaluations of a system's benefits and usability (Ishengoma, 2024).

Within this study, TAM is particularly relevant for explaining SMEs' adoption of digital financial services, including digital banking platforms, mobile-based micro-savings, digital credit systems, and technology-enabled micro-insurance (Thathsarani & Jianguo, 2022). SME owners are more likely to adopt these financial inclusion services when they perceive them as easy to use and beneficial to their business operations (Shahadat et al., 2023). Digital banking systems that simplify transactions and improve cash-flow management are likely to be adopted when they are perceived as reliable and efficient (Djibran, 2025). Similarly, technology-driven microcredit platforms are more attractive to SMEs when they perceive them as enhancing access to timely financing with minimal complexity (Millaningtyas et al., 2024). Therefore, the adoption of digital financial services positively influences SME performance by improving operational efficiency, financial management, and access to capital. Thus, TAM provides a theoretical explanation for how perceptions of usability and usefulness mediate the relationship between financial inclusion tools and SME performance.

Together, financial intermediation theory and the technology acceptance model offer a comprehensive framework for understanding the relationship between financial inclusion and SME performance, thereby reducing poverty. Financial intermediation theory explains why access to formal financial services, credit and loans, micro-insurance, and digital banking are essential for SMEs, while TAM explains how and why SMEs adopt these services. The integration of the two theories supports the study's assumption that improved access to financial services, combined with positive user perceptions, leads to enhanced SME performance in profitability, growth, and financial stability, and ultimately to poverty reduction among SMEs.

2 Empirical Literature

2.1 Financial inclusion and poverty reduction

Adam and Kulmie (2024) conducted a literature review to analyze the influence of financial inclusion on poverty reduction. The findings concluded that financial inclusion plays a great role in reducing poverty. Financial inclusion focused on affordability, accessibility, sustainability, and relevance of financial services. Poverty was addressed by reducing income inequality and creating jobs. However, because the analysis was based on an empirical literature review, it did not test the hypotheses. Moreover, the moderating role of digital capability was not examined. Saha and Qin (2023) used generalized method of moments (GMM) regression and group-based analysis to examine how financial exclusion affected poverty reduction across 156 lower, middle, and higher-income countries. The study considered the number of Automated Teller Machines, financial institution branches, depositors, accounts, borrowers, and loans as indicators of financial inclusion. Poverty was measured using households' consumption in the United States (US) dollars per day. The findings indicated that financial inclusion negatively influenced poverty reduction in countries with extreme poverty. The analysis, however, did not consider the role of the digital capability.

Mbodj and Laye (2025) assessed the influence of financial inclusion on poverty reduction in emerging economies using quantile regression. The results established that financial inclusion significantly and positively influenced poverty reduction in emerging economies. Financial inclusion was advanced through greater use of banking services and greater credit availability, while poverty reduction was achieved through the expansion of investment opportunities for low-income peopleHowever, the study did involve the role of digital capability in the analysis. Said and Acheampong (2023) investigated how financial inclusion influenced the reduction of energy poverty in 23 Sub-Saharan African countries. Canonical correlation and ordinary least squares regression were used in the analysis. The findings indicated that financial inclusion significantly and positively reduced energy poverty in SSA. However, the study did not consider how digital capability influenced the relationship between the independent and dependent variables.

Khan et al. (2022) demonstrated that financial efficiency, poverty, economic growth, and sustainability are driven by financial inclusion in G20 countries. The numbers of automatic teller machines, bank branches, and outstanding loans were used to measure financial inclusion. The GMM and factor analysis revealed a positive and significant long-run effect of financial inclusion on poverty. Again, the role of digital capability was skipped in the analysis. Aracil et al. (2022) investigated the link between financial quality, financial inclusion, and poverty in 75 developing countries using quantile regression. Financial inclusion was measured using deposit accounts, debit cards, ATMs, borrowers, branches, loans, and financial institutions. The poverty rate examines the level of poverty. The findings indicated that institutional quality reinforced the relationship between financial inclusion and poverty reduction. However, the study was silent on the influence of digital capability in explaining the relationship between financial inclusion and poverty reduction.

Turawa et al. (2025) examined the influence of financial inclusion on poverty reduction in Nigeria using structural equation modelling. Financial inclusion was measured through savings behaviours, possession of formal accounts, sources of formal and informal borrowing, and the availability of agricultural and health insurance. Poverty was measured through the Multidimensional Poverty Index. The findings indicated that financial inclusion had a positive and significant effect on poverty reduction. Moreover, financial literacy positively and significantly moderated the relationship between financial inclusion and poverty reduction. Nonetheless, the study ignored the role of digital capability in explaining the relationship between financial inclusion and poverty reduction.

2.2 Digital Capability SME Performance

Chen (2025), using descriptive and content analysis, revealed that components of digital capabilities, such as digital infrastructure, digital information management, digital analytics, digital operations, and digital transformation capability, promoted retail SME operational activities in Anhui Province, China. However, the influence of financial inclusion and poverty was beyond the scope of the study. Luo et al. (2025) used regression analysis and concluded that digital capabilities contributed positively to poverty reduction in China. However, the study did not consider the digital capabilities as a moderating variable.

Parianom et al. (2022) found, using the regression analysis, that digital capabilities improved economic status and reduced poverty in Indonesia. However, no assessment of the moderating effect of digital capabilities was conducted. Lechman and Popowska (2022) used trend analysis to examine how digital technologies enhanced poverty reduction in middle- and lower-income countries. The findings showed that digital technologies significantly and positively improved the incomes of middle- and lower-income countries. Sharma et al. (2025) found, through a systematic literature review, that digitalization reduced poverty in developing countries. However, digital technology has not been considered a moderating variable.

Aghazadeh et al. (2024) analyzed the moderating and mediating roles of digital capabilities in explaining how digital transformation drove SME internationalization. Ferreira et al. (2024) considered digital capabilities as a moderating variable that explained the relationship between knowledge spillovers and firm performance Sherani et al. (2025) considered information technology capability as a moderating variable in explaining the relationship among digital innovation, the knowledge creation process, and SME absorptive software capacity. Heredia et al. (2022) treated technology capabilities as a moderating variable to explain how digital capabilities influence the firm's performance.

The studies have contextualized the digital capabilities into different elements. Chen (2025) classified digital capability into infrastructure, information management, analytics, operations capability, and transformation capability. Kim and Jin (2024) operationalized digital capabilities as digital fluency, opportunity capability, and performance. Ullah et al. (2023) categorized digital capabilities into human, technical, innovation, and collaboration. According to Joensuu-Salo and Matalamäki (2023), acquiring digital technologies, identifying digital opportunities, responding to digital transformation, mastering digital technologies, and developing digital innovative products comprise the digital technology.

2.3 The research gaps

The empirical literature indicates that studies that integrate financial inclusion and poverty reduction, such as Saha and Qin (2023), Mbodj and Laye (2025), Said and Acheampong (2023), and Khan et al. (2022), are not country-specific; rather, they focus on specific regions. These studies focus on specific regions, such as the Middle, Lower, and Higher-income countries, G20 countries, Sub-Saharan Africa, or groups of countries. Hence, it is impossible to ascertain the influence of financial inclusion on a specific country, such as Tanzania.

The empirical review further establishes that studies that assessed the influence of digital capabilities on poverty reduction, such as Chen (2025), Luo et al. (2025), Parianom et al. (2022), Bhatti et al. (2025), and Lechman and Popowska (2022), agree on the influence of digital capabilities on poverty reduction. However, these studies have been conducted outside the African and Tanzanian contexts and therefore do not provide a clear picture of the influence of digital capabilities on poverty reduction in developing countries such as Tanzania.

Aghazadeh et al. (2024), Ferreira et al. (2024), Sherani et al. (2025), Heredia et al. (2022), and Kim and Jin (2024) have used digital capabilities to explain how variables such as knowledge spillovers, innovation, knowledge creation, and technology capabilities influence SME performance. However, the studies did not assess how the digital capability influences the relationship between financial inclusion and poverty reduction. Therefore, this study assessed how financial inclusion influenced poverty reduction, with digital capabilities as a moderating factor.

METHODOLOGY

Research Design

A positivist research philosophy guided this study. The study employed a deductive-quantitative approach to test hypothesized relationships between financial inclusion and poverty reduction among Small and Medium Enterprises (SMEs) in Tanzania. A cross-sectional survey design was adopted because it enables standardized data collection from a large number of firms at a single point in time and supports variable modelling using ordinary least squares multiple regression and hierarchical regression.

Study Area

The study was conducted in five regions of Tanzania, including Dar es Salaam, Mwanza, Arusha, Mbeya, and Mtwara, selected to reflect regional variation in economic activity and access to financial services. Dar es Salaam and Mwanza are high-growth commercial centers; Arusha and Mbeya are emerging business hubs with diversified SME sectors, while Mtwara is a coastal region with a relatively low economy (Todd et al., 2019). SMEs across these regions operate in trade, services, manufacturing, agribusiness, transport, and hospitality, making these settings suitable for examining how financial inclusion is associated with poverty-reduction outcomes.

Target Population

The target population comprised registered SMEs operating in the five selected regions. SME classification followed the Tanzania Ministry of Industry and Trade criteria based on the number of employees and capital investment. The unit of analysis was the SME owner/manager, as they are responsible for financial decisions and can report business-level and household welfare-related outcomes. Table 1 presents the regional distribution of SMEs (N = 25,000) based on NBS (2024).

Table 1

Population Distribution of SMEs

Region	Micro SMEs	Small SMEs	Medium SMEs	Total
Dar es Salaam	5,143	3,506	1,351	10,000
Mwanza	3,086	2,104	810	6,000
Arusha	2,057	1,402	541	4,000
Mbeya	1,543	1,052	405	3,000
Mtwara	1,029	701	270	2,000
Total	12,858	8,765	3,377	25,000

Source: (NBS, 2024)

Sample Size Determination

Sample size was determined using Cochran's (1977) formula for large populations at a 95% confidence level and 5% margin of error. With maximum variability assumed (p = 0.5), the minimum required sample was:

$n=Z^2pq/e^2$

Where:

$Z=1.96$ = Z-score for 95% confidence

$p=0.5$ = estimated proportion

$q=1-p=0.5$

$e=0.05$ = margin of error

n = sample size

$n=(1.96)^2(0.5)^2/(0.05)^2=0.9604/0.0025=384.16$

The required minimum sample size was therefore 385 SMEs. This sample size was considered sufficient to produce reliable, generalizable results across the five regions.

Sampling Strategy

A multi-stage stratified sampling strategy was employed to enhance representativeness. First, the population was stratified by region (five strata). Within each region, SMEs were further stratified by firm size (micro, small, medium) and sector (trade, services, manufacturing, agribusiness). Proportional allocation was used to distribute the sample size across regions according to SME population shares. Thereafter, SMEs were selected using simple random sampling from municipal business registers, trade associations, and local government listings. Where listings were incomplete, field listing was conducted to construct a sampling frame prior to random selection. Table 2 presents the achieved sampling distribution.

Table 2

Sampling Distribution

Region	Micro	Small	Medium	Total
Dar es Salaam	78	54	22	154
Mwanza	47	32	14	92
Arusha	33	22	7	62
Mbeya	24	16	6	46
Mtwara	16	11	4	31
Total	198	135	53	385

Source: Authors' computation using the proportionate sampling technique (2025)

Data Collection Procedures

Data were collected using a structured questionnaire administered through a mixed-mode approach combining: (i) enumerator-assisted face-to-face surveys, (ii) mobile-based questionnaires (WhatsApp/Google Forms), and (iii) a drop-and-pick-later method. The mixed-mode strategy increased coverage and improved response rates across heterogeneous SME categories and regions. A total of 385 questionnaires were distributed, and 347 valid responses were obtained (response rate ≈ 90%**).** Follow-ups via phone calls and reminder visits were used to minimize nonresponse in the unit. The distribution of responses remained aligned with the planned strata, reducing the likelihood of systematic non-response bias.

Measurement of Variables and Instrumentation

All latent constructs were measured using multi-item scales anchored on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Financial inclusion was operationalized using dimensions reflecting access to and use of financial services (presence of financial institutions, savings accounts, loan services, and Automated Teller Machines (ATMs)). SME poverty reduction captured improvements in business and household welfare (income growth, business stability, asset accumulation, employment creation, and household welfare). Digital capability was measured across infrastructure, information management, analytics, operations, and transformation, as proposed by Chen (2025). Table 3 shows the variables and measurements.

Table 3

Variables and Measurements

Construct	Indicators / Dimensions	Scale	Source(s)
Dependent Variable: SMEs Poverty Reduction (PR)	Income growth, business stability, asset accumulation, employment creation, and household welfare	5-point Likert scales (1 = Strongly disagree, 5 = Strongly agree)	Adam and Kulmie (2024), Aracil et al. (2022), Saha and Qin (2023)
Independent Variables-Financial Institutions (FI)	Diversity of financial institutions, service charges, diversity of services, and reliability of services	5-point Likert scales	Aracil et al. (2022);Saha and Qin (2023);Khan et al. (2022)
Savings accounts (SA)	Diversity of accounts, service charges, security of accounts, and staff service quality	5-point Likert scales	Saha and Qin (2023); Mbodj and Laye (2025); Turawa et al. (2025)
Loans services (LS)	Diversity of loans, interest rate, loan follow-up mechanism, loans for a special group	5-point Likert scales	Saha and Qin (2023); Khan et al. (2022); Turawa et al. (2025)
Automated Teller Machines-ATMs (AT)	Number of ATMs, accessibility, diversity of functions, and service quality	5-point Likert scales	Saha and Qin (2023); Khan et al. (2022): Adam and Kulmie (2024),
Moderating Variable-Digital Capability (DC)	Information management capability, analytics capability, operations capability, infrastructure capability, and transformation capability	5-point Likert scales	Chen (2025)

Source: Authors' Compilation from Literature Review (2026)

Validity, Reliability and Research Ethics

Validity was enhanced by ensuring that all variables and indicators were drawn from prior studies and from the TAM model and financial intermediation theory. Moreover, the experts in financial inclusion, poverty reduction, and digital capabilities were consulted to refine the questionnaire. Furthermore, the research tool was tested with 30 non-research participants, and the pretest results were used to refine the questionnaire. Reliability was assessed using Cronbach's alpha, and all variables achieved coefficients of 0.7 or higher, indicating acceptable reliability.

The researchers adhered to all essential research ethics as recommended by Drolet et al. (2023). The researchers obtained clearance from the Open University of Tanzania and from the local authorities of the five regions. Anonymity and confidentiality, consent-seeking, and privacy were adhered to during data collection. The researchers also prevented the results from being falsified or fabricated. Moreover, plagiarism was avoided by ensuring that the researchers cited all sources used in this article.

Data analysis

Prior to data analysis, the data were screened and missing values identified. Data screening involved cross-checking data patterns and the minimum and maximum values. As recommended by Austin et al. (2021), the mean was used to replace missing values. Outliers' assessment was done by analyzing the maximum and minimum values and mean and later using standardized scores and Mahalanobis distance. The data analysis involved descriptive statistics, Ordinary Least Squares, and hierarchical regression.

Ordinary least squares multiple linear regression analysis examined the influence of Financial Institutions (FI), Savings accounts (SA), Loans services (LS), Automated Teller Machines (AT), and the poverty reduction (PR). The Digital Capability (DC) was used as a moderating variable. The OLS regression equation was written as:

.$PR = \beta0 + \beta1AC + \beta2US + \beta3AFF+ B4DS +\varepsilon$……………………….1

The equation of Main Effects with Moderator (B5DC) is written as:

$PR = \beta0 + \beta1AC + \beta2US + \beta3AFF + \beta4DS + \beta5DC + \varepsilon$………..2

where the interaction Moderation model on the four independent variables is written as:

$PR = \beta0 + \beta1AC + \beta2US + \beta3AFF + \beta4DS + \beta5DC + \beta6(AC \times DC) + \beta7(US \times DC) + \beta8(AFF \times DC) + \beta9(DS \times DC) + \varepsilon$………..3

RESULT AND DISCUSSION

Descriptive statistics

Table 4 summarizes descriptive statistics for the study variables (N = 381). All constructs were computed as mean scores from five-point Likert items (1 = strongly disagree to 5 = strongly agree). The minimum, maximum, mean, and standard deviations for all variables are presented in Table 4.

Table 4

Descriptive statistics

Variable	Code	MEAN	SD	MIN	MAX
Financial institutions	FI	3.829	0.735	1	5
Savings accounts	SA	3.839	0.885	1.5	5
Loans Services	LS	4.016	0.784	1.5	5
Automatic Teller Machines	AT	3.895	0.721	1.33	5
Digital capabilities	DC	3.21	0.941	1.33	5
Poverty reduction	PR	4.003	0.826	1	5

Source: Field survey data and analysis (2026)

Correlation Analysis

The findings in Table 5 present the bivariate correlations analysis of the variables. The correlation results indicate that all variables exhibit significant, positive correlations. The correlation coefficients range from 0.417 to 0.494 ($p < .01$). The findings indicate that the loans and ATMs variables have higher correlations with other variables than the other variables do. The findings also indicate that the variables are not strongly correlated. This indicates that the variables are free of heteroscedasticity.

Table 5

Correlation Results

Variable	1	2	3	4	5	6
1. Financial institutions	1					
2. Savings accounts	.437**	1				
3. Loans	.458**	.442**	1			
4. ATMs	.419**	.395**	.484**	1		
5. Digital capabilities	.372**	.391**	.415**	.316**	1	
6. Poverty reduction	.467**	.417**	.426**	.494**	.447**	1

*Significance: ** p < 0.01*
Source: Field data analysis (2026)

Regression diagnostics

The researchers tested the essential assumptions of the multiple regression. Following Bansal and Singh's (2023) recommendations, the researcher tested the linearity assumption using a scatter plot and found that nearly all values lie on a straight line. The Durbin Watson value of 1.699 suggests that the model does exhibit the error term correlation because the values are within the range of 1.5 to 2.5 as recommended by Kabaila et al. (2021). The Breusch–Pagan test yielded the auxiliary R-square of 0.0130 with a Breusch pagan value of 4.945 (3 df) and a p-value of 0.176. Hence, as recommended by Ohaegbulem and Iheaka (2024), the homoscedasticity in the regression model is confirmed. The Skewness and Kurtosis values are within the range of -2 to +2, the VIF values are less than 5, and the tolerance values are greater than 0.1, aligning with Ovharhe (2022)'s recommendations; hence, the multicollinearity challenge was not confirmed. The recommendations of Drumond et al. (2019) were followed, as the Mahalanobis distance test showed that no data points had p-values of 0.000, thereby disconfirming the presence of outliers.

The regression findings indicate an R-squared of 0.624, indicating that the independent variables explain the dependent variable well and that the model is well specified, accounting for 62.4% of the variance. The F-value is large and significant, indicating a strong relationship between the independent and dependent variables. The standardized error of the estimate is also small, indicating that the model specification was well-conceived.

The regression analysis indicates that financial institutions have a positive and significant effect on financial literacy. The findings signify that diversity of financial institutions, service charges, diversity of services and reliability of services enhanced the financial institutions for SME owners in Tanzania. The findings demonstrate that improving financial inclusion requires greater access to formal financial institutions. Moreover, service charges should be reduced to encourage more SMEs to use formal financial services. Besides, there should be financial institutions that provide diverse, reliable financial services. The findings are consistent with Aracil et al. (2022), Saha and Qin (2023), and Khan et al. (2022), who reported that financial institutions promoted financial inclusion and poverty reduction in developing, lower-, middle-, and higher-income countries, and in G20 countries, respectively.

The findings further indicated that savings accounts significantly promoted financial inclusion among SME owners in Tanzania. The findings established that many SME owners were encouraged to open savings and deposit accounts, thereby promoting financial inclusion. The findings further show that the diversity of accounts, service charges, account security, and staff service quality promoted financial inclusion. The findings indicate that, to promote financial inclusion among SME owners in Tanzania, financial institutions should diversify savings account offerings, reduce savings account charges, enhance account security, and improve the quality of account services. This would encourage more SME owners to open and maintain their bank accounts, thereby improving their financial inclusion. The findings align with those of Saha and Qin (2023), Mbodj and Laye (2025), and Turawa et al. (2025), who maintain that savings and deposit accounts promote financial inclusion and poverty reduction in lower-, middle-, and higher-income countries, including Nigeria.

The findings further show that the loan services promoted financial inclusion and poverty reduction in a positive and significant way. The findings demonstrate that, for financial inclusion to promote poverty reduction, loans should be diversified and have favourable interest rates. Moreover, there should be a robust loan follow-up mechanism, and financial institutions should provide loans to special groups, such as people with disabilities, youth, and women. Diversity of loans, interest rates, loan follow-up mechanisms, and loans for special groups. The findings align with those of Saha and Qin (2023), Khan et al. (2022), and Turawa et al. (2025), who found that loan provisions promoted financial inclusion and poverty reduction in lower-, middle-, and higher-income G20 countries, and in Nigeria, respectively.

The findings revealed that ATM availability positively and significantly promoted financial inclusion and, in turn, poverty reduction among SME owners in Tanzania. The findings demonstrate that increasing the number of ATMs can improve financial inclusion and reduce poverty among SME owners in Tanzania. Moreover, the number of ATMs should be increased, and they should offer a wider range of functions, such as fund transfers, savings, and deposits. The findings align with those of Saha and Qin (2023) and Khan et al. (2022), who found that ATM availability and ATM services promote financial inclusion and poverty reduction in lower-, middle-, and higher-income countries, as well as in G20 countries.

Hierarchical Regression and Moderation Test

The hierarchical regression findings in Table 5 examine the moderating role of digital capability. The findings establish how digital capability explains the relationships among financial institutions, savings accounts, loan services, and automatic teller machines. The moderating effect of digital capability increased the R^2 (Model 2) from 0.620 to 0.736, indicating a significant increase ($\Delta R^2 = 0.116$, $p < .001$). The findings indicate that digital capability has greater potential to accelerate the effective functioning of financial inclusion and thereby improve poverty reduction for SME owners. The findings are consistent with Chen (2025), who identified digital capabilities in terms of digital infrastructure, digital information management, digital analytics, digital operations, and digital transformation promoted retail SME operational activities in Anhui Province, China. Parianom et al. (2022) found that digital capabilities improved economic status and reduced poverty in Indonesia. Lechman and Popowska (2022) showed that digital technologies significantly and positively improved the incomes of middle- and lower-income countries.

The Model 3 results demonstrate that the inclusion of interaction terms improved the regression model, attaining $R^2 = 0.761$ and $\Delta R^2 = 0.025$ ($p < 0.01$). The finding indicates that the interaction between digital capability and savings accounts is positive and statistically significant, suggesting that incorporating digital capability into SME owners' savings accounts can foster financial inclusion and reduce poverty. However, the findings indicate that interactions among digital services, financial institutions, loan services, and ATMs do not reduce poverty among SME owners in Tanzania. In other words, these factors cannot promote poverty reduction when integrated individually with digital capability (model 2). Table 6 presents the results of hierarchical regression and moderation tests.

Table 6

Hierarchical Regression and Moderation Test Results

Variables	*Model 1*	*Model 2*	*Model 3*
Constant	*1.912****	*1.643****	*1.648****
FI	*0.382****	*0.295****	*0.301****
SA	*0.214****	*0.196****	*0.182****
LS	*0.419****	*0.322****	*0.329****
AT	*0.016*	*0.099***	*0.084*
DC		*0.409****	*0.409****
FI × DC			*0.050*
SA × DC			*0.321****
LS × DC			*0.017*
AT × DC			*0.112*
R^2	*0.620*	*0.736*	*0.761*
Adjusted R^2	*0.615*	*0.733*	*0.754*
ΔR^2	*-*	*0.116****	*0.025***
F	*153.00****	*210.13****	*88.47****
Durbin–Watson	*1.77*	*1.77*	*1.77*

Source: Research findings (2026)

CONCLUSION

The findings indicated that the financial inclusion variables of financial institutions, savings and accounts, loan services, and ATM services positively and significantly influenced the poverty reduction among the SME owners in Tanzania. The findings imply that, for financial inclusion to promote positive poverty reduction among SME owners, the number of financial institutions should be increased, and savings accounts should be available and reliable. Moreover, the loan services and ATMS should be available and reliable.

The findings also indicated that digital capabilities were associated with a positive, significant relationship between financial inclusion and poverty reduction. The findings indicated that digital financial inclusion services, including information management, analytics, operations, infrastructure, and transformation capabilities, catalyze the functioning of financial inclusion components to achieve poverty reduction. The findings on interaction effects showed that only savings accounts should be interacted with other components of financial inclusion and digital capability to promote poverty reduction among SME owners.

IMPLICATIONS OF THE FINDINGS

The study offers the practical, policy and theoretical implications.

Practical implications

SME owners should leverage financial institutions' financial inclusion services, such as savings accounts, loan services, and ATMs, to promote financial inclusion and thereby enhance poverty reduction. SME owners should also use digital financial inclusion services to strengthen the role of financial inclusion in poverty reduction. The financial service provider should reduce service charges and enhance the reliability of savings accounts, loan services, and ATMs.

Policy implications

Policymakers should promote financial inclusion by ensuring the accessibility and reliability of financial institutions, savings accounts, loan services, and automated teller machines. Policies on digital capabilities should be emphasized, as they enhance the effectiveness of financial inclusion in reducing poverty.

Theoretical implications

First, the results strengthen inclusive finance theory by demonstrating that multidimensional financial inclusion is substantially associated with poverty-reduction outcomes among SMEs in a developing economy setting. Second, the study argues that digital capabilities are essential to fostering both financial inclusion and poverty reduction among SME owners. Therefore, the main contribution is to integrate TAM with financial intermediation theory, demonstrating that, when combined with digital capabilities, financial inclusion plays an essential role in promoting financial inclusion and poverty reduction among SME owners in Tanzania. The literature indicates that the prior studies have not considered this kind of integration.

Limitations and Future Research

The study uses cross-sectional survey data; therefore, the results should be interpreted carefully, as they do not reflect a longitudinal perspective. Future research could employ panel data or quasi-experimental designs to strengthen causal inference. Additionally, future studies may explore whether the moderation effect varies across SME categories (micro, small, and medium), sectors, or regions. Mediated variables and mixed-method studies may be conducted to address the limitations of this study.

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RAW DATA

Reliability analysis

Variable	Number of indicators	Cronbach alpha
Financial institutions	4	0.782
Savings accounts	4	0.806
Loans	4	0.788
ATMs	4	0.845
Digital capabilities	5	0.774
Poverty reduction	4	0.794

Correlations

		FI	SA	LS	AT	DC	PR
FL	Pearson Correlation	1	.437**	.458**	.419**	.372**	.467**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	381	381	381	381	381	381
SA	Pearson Correlation	.437**	1	.442**	.395**	.391**	.417**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	381	381	381	381	381	381
LS	Pearson Correlation	.458**	.442**	1	.484**	.415**	.326**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	381	381	381	381	381	381
AT	Pearson Correlation	.419**	.395**	.484**	1	.316**	.494**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	381	381	381	381	381	381
DC	Pearson Correlation	.372**	.391**	.415**	.316**	1	.447**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	381	381	381	381	381	381
PR	Pearson Correlation	.467**	.417**	.426**	.494**	.447**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	381	381	381	381	381	381
**. Correlation is significant at the 0.01 level (2-tailed).							

Reliability analysis

Variable	Number of indicators	Cronbach alpha
Financial institutions	4	0.782
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Poverty reduction	4	0.794

REGRESSION MODEL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin–Watson
1	0.787	0.620	0.615	0.509	0.620	153.000	4	376	.000	1.77
2	0.858	0.736	0.733	0.427	0.116	164.214	1	375	.000	1.77
3	0.872	0.761	0.754	0.401	0.025	9.680	4	371	.000	1.77

2. ANOVA

Model 1

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	161.38	4	40.35	153.00	.000
Residual	98.87	376	0.263		
Total	260.25	380			

Model 2

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	191.58	5	38.32	210.13	.000
Residual	68.67	375	0.183		
Total	260.25	380			

Model 3 (Interaction Model)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	198.06	9	22.01	88.47	.000
Residual	62.19	371	0.168		
Total	260.25	380			

3. Coefficients

Model	Variable	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.912	0.184	–	10.39	.000
	FI	0.382	0.067	0.336	5.71	.000
	SA	0.214	0.051	0.246	4.19	.000
	LS	0.419	0.051	0.401	8.22	.000
	AT	0.016	0.065	0.012	0.25	.802
2	(Constant)	1.643	0.145	–	11.33	.000
	FI	0.295	0.058	0.264	5.11	.000
	SA	0.196	0.043	0.210	4.54	.000
	LS	0.322	0.044	0.305	7.31	.000
	AT	0.099	0.032	0.122	3.10	.002
	DC	0.409	0.033	0.368	12.53	.000
3	(Constant)	1.648	0.146	–	11.28	.000
	FI	0.301	0.059	0.269	5.10	.000
	SA	0.182	0.044	0.195	4.14	.000
	LS	0.329	0.045	0.311	7.31	.000
	AT	0.084	0.034	0.104	2.47	.014
	FI	0.409	0.033	0.368	12.53	.000
	FI × DC	0.050	0.075	0.031	0.66	.508
	SA × DC	0.321	0.070	0.214	4.57	.000
	LS× DC	0.017	0.064	0.013	0.27	.788
	AT × DC	0.112	0.095	0.058	1.18	.240

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ФІНАНСОВА ІНКЛЮЗІЯ ТА ЗМЕНШЕННЯ БІДНОСТІ СЕРЕД МАЛИХ ТА СЕРЕДНІХ ПІДПРИЄМСТВ У ТАНЗАНІЇ: МОДЕРУЮЧА РОЛЬ ЦИФРОВИХ МОЖЛИВОСТЕЙ

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У дослідженні розглянуто вплив фінансової інклюзії на скорочення бідності серед власників малих та середніх підприємств (МСП) у Танзанії. Зокрема, його метою було оцінити вплив доступу до фінансових установ, ощадних рахунків, кредитних послуг та банкоматів на результати боротьби з бідністю. Крім того, у дослідженні було досліджено пом'якшувальну роль цифрових можливостей, включаючи цифрову інфраструктуру, управління інформацією, аналітику, операційну ефективність та трансформаційний потенціал, у з'ясуванні взаємозв'язку між фінансовою інклюзією та скороченням бідності. У дослідженні проаналізовано вплив фінансової інклюзії на скорочення бідності серед власників малих і середніх підприємств (МСП) у Танзанії. Зокрема, оцінено вплив доступу до фінансових установ, ощадних рахунків, кредитних послуг та банкоматів (ATM) на показники подолання бідності. Крім того, досліджено модераційну роль цифрових спроможностей – зокрема цифрової інфраструктури, управління інформацією, аналітики, операційної ефективності та трансформаційного потенціалу – у поясненні взаємозв’язку між фінансовою інклюзією та зменшенням бідності. Дослідження виконано в межах перехресного пояснювального дизайну на основі дедуктивного підходу із застосуванням анкетного опитування для збору даних. Використано багатоступеневу процедуру простої випадкової вибірки для формування вибірки з 381 власника МСП у п’яти регіонах: Дар-ес-Салам, Мванза, Аруша, Мбея та Мтвара. Первинні дані зібрано за допомогою структурованої анкети. Обробку даних здійснено із застосуванням методів описової статистики, регресійного аналізу за методом найменших квадратів (OLS) та ієрархічного регресійного аналізу. Дослідження є першим, у якому інтегровано теорію прийняття технологій із теорією фінансового посередництва з метою комплексного пояснення того, як фінансова інклюзія та цифрові спроможності у взаємодії сприяють скороченню бідності в країнах, що розвиваються.

Ключові слова: фінансова інклюзія, фінансові установи, ощадні рахунки, кредитні послуги, банкомати (ATM), цифрові спроможності, скорочення бідності, Танзанія.