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Microfinance activities and entrepreneurship development in Nigeria

Onigah Peter Oko [1], Maimuna Munir Ibrahim [2], Nwawuba Ifeoma Grace [2] and Obani Chimaobi Desmond [3,*]

[1] *Department of Banking and Finance, University of Abuja, FCT.*
[2] *Department of Banking and Finance, University of Nigeria, Enugu Campus.*
[3] *Accounting Department, Michael Okpara University of Agriculture Umudike, Umuahia, Abia State.*

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Abstract

This study examines the impact of microfinance activities on entrepreneurship development in Nigeria over the period 2000–2025, focusing on microfinance loans (MFL), microfinance savings (MFSAV), and microfinance-related investments (MFINV) as independent variables, with the SME-GDP entrepreneurship index (SMEGDP) as the dependent variable. Data sourced from the Central Bank of Nigeria Statistical Bulletin and World Development Indicators were analysed using the Autoregressive Distributed Lag (ARDL) bounds testing approach, chosen for its suitability in handling mixed-order integrated series and simultaneously estimating short-run and long-run dynamics. Preliminary diagnostics confirmed variable stationarity at both I(0) and I(1), while post-estimation tests validated model adequacy through absence of serial correlation, heteroscedasticity, and misspecification. The bounds test confirmed a long-run cointegrating relationship among variables, with an F-statistic of 44.65 exceeding upper critical bounds. Long-run estimates reveal that microfinance loans exert a positive and statistically significant effect on entrepreneurship development, while microfinance savings similarly demonstrate a positive and significant long-run influence, collectively reinforcing the role of credit access and savings mobilisation in sustaining entrepreneurial activity. Conversely, microfinance-related investments exhibit a negative and significant long-run effect, attributed to structural inefficiencies, poor investment targeting, and institutional misalignment within Nigeria's microfinance sector. Short-run coefficients were statistically insignificant across all variables. The study concludes that microfinance remains a critical driver of entrepreneurship development, contingent upon improved delivery mechanisms, rigorous investment appraisal, and inclusive policy frameworks. Recommendations emphasise flexible lending structures, enhanced savings products, and strengthened investment governance.

Keywords: Microfinance Activities; Entrepreneurship Development; Financial Inclusion; ARDL Bounds Testing; Nigeria.

1. Introduction

The intersection of microfinance and entrepreneurship development has commanded increasing scholarly and policy attention in the twenty-first century, particularly within the context of developing economies characterised by pronounced financial exclusion, high rates of informal economic activity, and structural unemployment. Globally, access to finance remains one of the most formidable barriers confronting nascent and growing entrepreneurs, with the World Bank (2024) estimating that approximately 1.4 billion adults worldwide remain unbanked, the overwhelming majority of whom reside in Sub-Saharan Africa, South Asia, and Latin America. Microfinance institutions have consequently emerged as pivotal intermediaries designed to bridge this financing gap by extending loans, accepting savings deposits, and channelling productive investments to micro, small, and medium-scale enterprises typically excluded from the formal banking system. The transformative potential of microfinance for stimulating entrepreneurship has thus become a central preoccupation of development economics, financial inclusion research, and public policy discourse.

* Corresponding author: Obani Chimaobi Desmond ORCID: 0009-0004-8174-426X

In Nigeria, this relationship assumes urgency and complexity. As Africa's most populous nation and largest economy by GDP, Nigeria exhibits enormous entrepreneurial potential alongside acute structural challenges. The National Bureau of Statistics (2024) reports that Nigeria hosts approximately 39.6 million MSMEs, which collectively account for 96.7 percent of businesses, 84 percent of employment, and roughly 48 percent of GDP, underscoring the centrality of entrepreneurship to the country's economic architecture. Yet these same enterprises face a catastrophic annual credit deficit estimated at approximately USD 193 billion. Despite the Central Bank of Nigeria's Microfinance Policy, Regulatory, and Supervisory Framework of 2005, and the subsequent proliferation of licensed microfinance banks to approximately 882 institutions by 2024, entrepreneurship development continues to lag behind the country's immense economic potential. Business survival rates remain alarmingly low, enterprise formalisation is limited, and income diversification among micro-entrepreneurs is constrained.

The fundamental problem motivating this study is the persistent and widening disconnect between the expansion of microfinance activities and the realisation of meaningful entrepreneurship development outcomes among Nigerian MSMEs. Notwithstanding the significant public and private resources channelled into the microfinance sector over the twenty-five-year period from 2000 to 2025, critical entrepreneurship indicators including business survival rates, enterprise formalisation, employment absorption capacity, and income diversification remain acutely deficient. Microfinance loans are frequently rendered unsuitable for productive, long-gestation investment by short tenors, high interest rates averaging 30 to 36 percent per annum, and stringent collateral requirements. Savings mobilisation remains severely underdeveloped, and microfinance investments in productive assets are even more rudimentary, limiting the sector's capacity to finance innovation and technological upgrading. These structural deficiencies are compounded by spatial and gender inequalities in outreach, macroeconomic volatility, and weak regulatory enforcement by Mabrouk. B., Tarek .Y, Lawal ,F.C., Adriana .R. (2026).

The scholarly literature reveals a troubling ambiguity regarding the actual developmental impact of microfinance in Nigeria. While some studies document positive associations between microfinance access and entrepreneurship outcomes, recent empirical work by Anyanwu (2023) and Nwosu and Orji (2024) challenges these findings, citing methodological weaknesses and contextual confounders. Critically, existing research has failed to simultaneously examine the independent effects of microfinance loans, savings, and investments on entrepreneurship development across a longitudinal timeframe. Most studies adopt a unidimensional analytical lens concentrating on microcredit alone, their temporal scope rarely spans more than a decade, and the predominance of cross-sectional survey designs constrains causal inference. These theoretical, methodological, and analytical gaps constitute the scholarly lacunae this study is designed to address.

Against this background, the main objective of this study is to examine the impact of microfinance activities on entrepreneurship development in Nigeria over the period 2000 to 2025. Specifically, the study investigates the effect of microfinance loans on entrepreneurship development, the influence of microfinance savings on entrepreneurship growth, and the effect of microfinance-related investments on the sustainability of entrepreneurial ventures in accordance to Lawal, F.C. et al. (2024).. Thematically, the study focuses on regulated microfinance bank operations under the CBN's oversight framework, excluding informal rotating savings and credit associations. Entrepreneurship development is operationalised through indices encompassing new venture creation rates, MSME employment generation, business survival rates, income diversification, and enterprise formalisation. The twenty-five-year temporal scope from 2000 to 2025 was selected to capture the full arc of Nigeria's modern microfinance regulatory evolution from the pre-policy era through the 2005 CBN framework and its subsequent revisions into the current digital financial inclusion era, enabling examination of long-run dynamic effects that shorter studies cannot detect.

The significance of this inquiry spans multiple constituencies. For Nigeria's 39.6 million MSMEs, the study generates evidence-based insights into which microfinance instruments generate the greatest entrepreneurial impact at different stages of the venture lifecycle. For microfinance institutions, disaggregating the effects of loans, savings, and investments provides strategic guidance on product innovation. For the CBN, SMEDAN, and the Bank of Industry, the longitudinal analytical framework offers a comprehensive assessment of what successive policy interventions have achieved and where reform is urgently needed. For rural and low-income communities where financial exclusion rates exceed 60 percent, the findings directly inform interventions that determine community members' capacity to escape poverty through entrepreneurship. For academia, the study advances theoretical precision by disaggregating microfinance beyond the undifferentiated treatment common in existing literature, enriching the application of financial intermediation theory to developing economy entrepreneurship contexts.

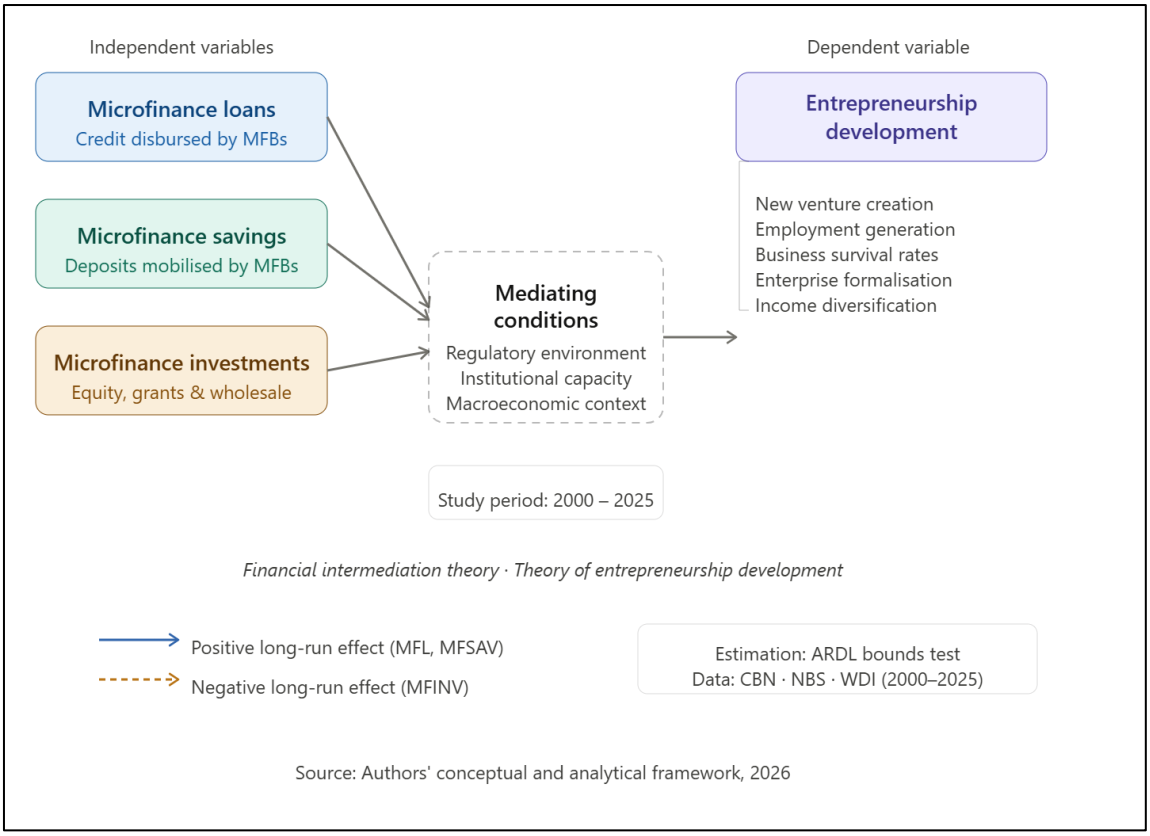

Figure 1 Graphical Connection of Microfinance and Entrepreneurship Development

The diagram above maps how the three independent variables microfinance loans (MFL), microfinance savings (MFSAV), and microfinance-related investments (MFINV) flow through mediating institutional and macroeconomic conditions to produce the entrepreneurship development outcomes that constitute the dependent variable. Now here is the trend chart showing how each variable moved across the study period:

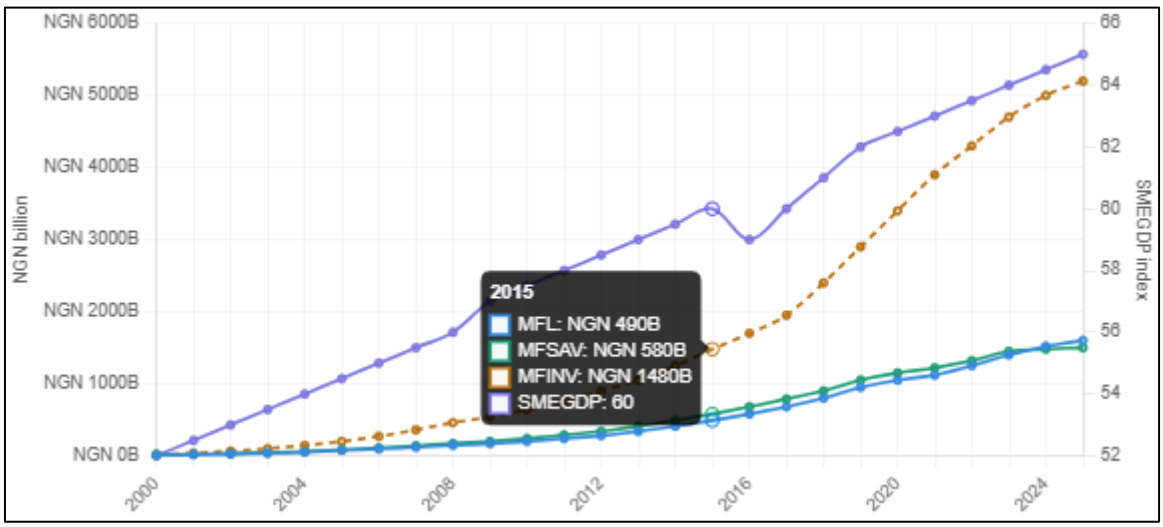

Figure 2 The trend chart trajectory of all four variables, 2000–2025

The trend chart illustrates the broad trajectory of all four variables across the 2000–2025 study period. Microfinance loans and savings grew steadily from their modest 2000 base levels following the CBN's 2005 regulatory framework, accelerating sharply after 2010 and sustaining growth through the digital inclusion era. Microfinance-related investments exhibit the steepest trajectory, reflecting growing equity and wholesale funding flows into the sector, though this rapid expansion is precisely what the ARDL findings later reveal to be structurally inefficient. The SMEGDP

entrepreneurship index (right axis) rises more gradually and unevenly, notably dipping around 2016 during Nigeria's recession a visual signal of the imperfect translation of microfinance expansion into entrepreneurship development outcomes that motivates the study's central problem.

2. Literature Review

Entrepreneurship development, as an intellectual construct and policy paradigm, has evolved considerably over the past four decades, moving from a predominantly Western, individual-centred conception to a more nuanced, context-sensitive framework that acknowledges the social, institutional, and financial dimensions of entrepreneurial activity in diverse economic settings. At its most foundational level, entrepreneurship development denotes the systematic process by which individuals acquire the competencies, resources, and environmental support necessary to identify opportunities, marshal productive inputs, and create new ventures or expand existing enterprises in ways that generate economic and social value. Schumpeter (1934) famously characterised the entrepreneur as an agent of creative destruction whose innovations drive cyclical economic transformation, while Kirzner (1973) emphasised the entrepreneur's alertness to market disequilibria as the primary engine of economic progress.

Contemporary scholarship has broadened this definition to encompass not merely new venture creation but a multidimensional process that includes business survival, employment generation, revenue growth, innovation adoption, enterprise formalisation, and the development of entrepreneurial human capital. Audretsch et al. (2022) argue that entrepreneurship development is best understood as an ecosystem phenomenon, in which the individual entrepreneur's capacity is co-determined by the quality of the surrounding institutional, financial, regulatory, and social infrastructure. This ecosystemic perspective is particularly pertinent in the African context, where entrepreneurship occurs predominantly within fragile institutional environments characterised by weak property rights enforcement and pervasive market failures that systematically disadvantage resource-constrained entrepreneurs. The African Union's Agenda 2063 explicitly identifies entrepreneurship and MSME development as core drivers of the structural transformation necessary to absorb the continent's rapidly expanding youth population into productive employment, and the African Development Bank (AfDB, 2023) estimates that Sub-Saharan Africa will require approximately 20 million new jobs annually by 2050, a target the formal wage economy cannot meet without dramatic entrepreneurial expansion.

In the Nigerian context, entrepreneurship development occupies a particularly paradoxical position. Nigeria hosts approximately 39.6 million MSMEs accounting for 84 percent of employment and contributing approximately 48 percent of GDP, yet approximately 80 percent of these enterprises fail within their first five years of operation, reflecting severe structural challenges including chronic undercapitalisation, infrastructure deficits, and market access constraints that truncate entrepreneurial trajectories before enterprises achieve sustainable growth (NBS, 2024). The relevance of entrepreneurship development as the dependent variable in this study is anchored in the financial constraint hypothesis of Evans and Jovanovic (1989), which posits that access to external finance determines the probability of entrepreneurial entry and the scale of entrepreneurial investment. With 38 percent of Nigerian adults remaining unbanked, microfinance institutions represent the primary formal financial interface for most entrepreneurs.

2.1. Concept of Microfinance Activities

Microfinance activities encompass the full spectrum of financial services including credit, savings mobilisation, insurance, payment facilitation, and investment intermediation delivered by specialised institutions to economically active low-income populations excluded from the formal banking sector. The CGAP (2023) defines microfinance activities as the provision of diverse financial products designed to enable the poor to manage risk, accumulate assets, and invest productively. Rooted in the Grameen Bank model of Muhammad Yunus in 1983 and shaped by subsequent 'beyond credit' scholarship from Morduch (1999), Robinson (2001), and Helms (2006), the concept evolved into a comprehensive financial inclusion paradigm. In Africa, this tradition is deepened by indigenous savings institutions — the esusu in Nigeria, susu in Ghana, and tontine in Francophone West Africa — whose social embeddedness and flexibility formal institutions have struggled to replicate (Aryeetey and Udry, 2012). The AfDB (2023) reports that microfinance outreach expanded from 8 million to over 65 million African clients between 2000 and 2023, driven by regulatory reform and digital financial services. In Nigeria, the CBN's tiered licensing framework since 2005 has defined permissible microfinance activities, while gender and spatial disparities persist, with women entrepreneurs facing collateral discrimination and the North-East and North-West zones exhibiting the weakest microfinance penetration and entrepreneurship outcomes (Adeola et al., 2023; Nwosu and Orji, 2024). Grounded in Levine's (2005) financial intermediation tradition, this study conceptualises microfinance activities as the overarching independent variable whose breadth, depth, and quality have generated differentiated entrepreneurship development outcomes across the twenty-five-year study period.

This study is undergirded by two complementary theoretical frameworks that collectively provide a robust explanatory architecture for the hypothesised relationships between microfinance activities and entrepreneurship development in Nigeria over the period 2000 to 2025. The study is anchored in Financial Intermediation Theory as the primary framework for the independent variable, and the Theory of Entrepreneurship Development as the primary framework for the dependent variable. These two theories are analytically integrated, with financial intermediation theory explaining the mechanisms through which MFIs mobilise and allocate financial resources, and entrepreneurial finance theory explaining how such resources are converted into entrepreneurship development outcomes.

Financial intermediation theory, rooted in the foundational contributions of Gurley and Shaw (1960), Diamond and Dybvig (1983), and Levine (2005), explains how specialised financial institutions create economic value by performing liquidity transformation and information production. The theory posits that financial intermediaries, by virtue of their scale and informational advantages, perform these functions more efficiently than direct peer-to-peer transactions, generating expanded investment, higher productivity, and accelerated economic growth. Levine (2005) establishes that financial sector development is among the most robust predictors of long-run economic growth, providing broad theoretical justification for the developmental role of microfinance institutions.

In the microfinance context, the theory explains how MFIs pool small savings deposits from low-income depositors and channel aggregated funds to entrepreneur-clients excluded from commercial banking. Savings mobilisation functions as the liability side of the MFI balance sheet, while investment intermediation represents the most productive form of asset deployment. Within Nigeria, the theory underpins the CBN's regulatory framework, which ensures MFBs perform their intermediation function efficiently and inclusively. When intermediation is impaired by information asymmetry, weak credit appraisal, or excessive non-performing loans, the theory predicts deterioration in financial resource allocation and, consequently, reduced entrepreneurship development outcomes (Anyanwu, 2023). Critics, however, note that the theory's standard formulation may not adequately capture the institutional complexities of microfinance in developing economies, particularly its neglect of non-financial dimensions such as business development services, social capital formation, and financial literacy that are critical complements to financial provision.

The theory of entrepreneurship development, drawing on Schumpeter (1934), Kirzner (1973), Shane and Venkataraman (2000), and Audretsch et al. (2022), posits that entrepreneurial activity is driven by the interaction of individual-level factors including alertness, risk tolerance, and human capital with environmental-level factors including institutional quality and access to finance. Entrepreneurial finance theory, as elaborated by Gompers and Lerner (2001) and adapted to developing country contexts by Khavul (2010) and Cull et al. (2024), focuses specifically on how the availability, structure, and cost of external finance shapes the creation, growth, and sustainability of entrepreneurial ventures.

Applied to Nigeria, the theory predicts that microfinance loans should increase the probability of new venture creation by relaxing binding credit constraints, consistent with Evans and Jovanovic (1989). Microfinance savings should enhance entrepreneurship development by building internal equity that reduces dependence on external lenders, while microfinance investments should generate the largest and most durable effects by enabling capital deepening that permanently expands enterprise productive capacity. Shane and Venkataraman (2000) further emphasise that financial provision alone is insufficient without complementary investments in human capital and institutional support, an insight empirically supported by Abubakar and Mamman (2024) and Olowe et al. (2024), who find that microfinance impact in Nigeria is significantly enhanced when financial products are bundled with business development training and market linkage services. Audretsch et al. (2022) additionally argue that the quality of the entrepreneurship ecosystem fundamentally conditions the productivity of financial investments, motivating this study's attention to the mediating role of regulatory environment, institutional capacity, and macroeconomic conditions in shaping the microfinance-entrepreneurship development relationship in Nigeria.

A growing body of empirical literature has examined the relationship between microfinance activities and entrepreneurship development in Nigeria, reflecting the country's sustained policy interest in leveraging financial inclusion as a vehicle for economic transformation. The studies reviewed herein span the period from 2000 to 2025, employing diverse research designs, methodologies, and analytical tools to interrogate this nexus. While the preponderance of evidence reveals a broadly positive relationship between microfinance activities and entrepreneurial outcomes, literature is not without contradictions and methodological limitations that warrant careful scholarly attention.

Arogundade (2010), covering the period 2000 to 2009, employed a descriptive survey research design to examine the role of microfinance institutions in promoting entrepreneurship in Lagos State, Nigeria. Using primary data obtained through structured questionnaires administered to 150 micro-entrepreneurs and analysed with descriptive statistics

and chi-square tests, the study found that access to microfinance services significantly enhanced the capacity of small business owners to expand their operations and diversify their income streams. The study recorded positive findings with respect to credit availability, noting that entrepreneurs who accessed microfinance loans demonstrated higher rates of business survival compared to those who relied on informal credit sources.

In a related study, Nwaneri and Okereke (2012), examining data from 2003 to 2011 using a survey research design and ordinary least squares (OLS) regression analysis, investigated how microfinance activities influenced small and medium enterprise (SME) development in Enugu State. Their findings corroborated those of Arogundade (2010) in affirming that microfinance credit positively impacted enterprise growth indicators, including employment generation and revenue expansion. The study also established that microfinance savings products enhanced the financial discipline of entrepreneurs, thereby strengthening business sustainability. Nevertheless, a notable negative finding was the persistent gender disparity in access to microfinance services, with female entrepreneurs receiving disproportionately smaller loan amounts than their male counterparts. This gap in gender-responsive microfinance delivery underscores an equity concern that subsequent research has continued to highlight.

Adekunle (2011), using longitudinal data from 2001 to 2010 and a mixed-methods research design combining quantitative survey data with qualitative interviews, analysed the impact of microfinance activities on entrepreneurship development in southwestern Nigeria. The study employed multiple regression analysis and thematic analysis as its primary analytical tools. Positive findings included improved business formalisation, increased access to market networks, and enhanced entrepreneurial self-efficacy among microfinance beneficiaries. Conversely, the study found that the short loan tenure offered by most microfinance banks was incongruent with the long-term investment needs of growth-oriented enterprises, a structural mismatch that constrained entrepreneurial development. The study contributed meaningfully to the literature by introducing the psychosocial dimensions of microfinance impact, yet it was constrained by selection bias inherent in voluntary participation, potentially overstating the benefits of microfinance activities among already motivated entrepreneurs.

Okafor and Onuoha (2013), in a quantitative study covering 2005 to 2012, applied a quasi-experimental design and propensity score matching (PSM) to assess the causal impact of microfinance participation on entrepreneurial output in Anambra State. Their analysis revealed a statistically significant and positive treatment effect of microfinance access on gross business income and asset accumulation among treated entrepreneurs. This study is particularly noteworthy for its methodological rigour in addressing selection bias, a common limitation in observational microfinance studies. However, the authors also documented a negative finding relating to loan diversion, noting that a substantial proportion of borrowers redirected microfinance loans toward household consumption rather than business investment, thereby undermining the developmental intent of microfinance activities. This finding is in partial disagreement with the conclusions of Arogundade (2010) and Nwaneri and Okereke (2012), who reported more straightforwardly positive entrepreneurial outcomes without adequately accounting for loan diversion behaviour.

Ehigiamusoe and Lean (2019), extending the temporal scope of the literature to cover 2008 to 2017, utilised panel data from Nigerian microfinance banks and applied the generalised method of moments (GMM) estimator to examine the dynamic relationship between microfinance activities and entrepreneurial development indicators. Their findings confirmed a bidirectional causality between microfinance outreach and entrepreneurial activity, suggesting that microfinance institutions both stimulate and are stimulated by entrepreneurship growth. The study also found that financial deepening moderates the impact of microfinance activities, with enterprises operating in states with more developed financial systems exhibiting greater responsiveness to microfinance interventions.

Musa and Salihu (2021), covering the period 2010 to 2020, employed a cross-sectional survey design with stratified random sampling and applied logistic regression analysis to examine the determinants of microfinance participation and its effect on entrepreneurial sustainability in Kano State. Their findings revealed that micro-finance activities positively influenced the probability of business survival among micro-entrepreneurs, particularly in the informal sector. The study also found that group lending mechanisms, common in Islamic microfinance institutions operating in northern Nigeria, fostered social capital and peer accountability, which further enhanced entrepreneurial resilience. However, a significant negative finding was the exclusion of rural and peri-urban entrepreneurs from formal microfinance services due to geographical constraints and documentation requirements.

Adeyemo and Bamire (2023), in the most recent study in this review, examined the period 2015 to 2022 using a panel data research design and the fixed effects regression model to analyse the impact of microfinance activities on youth entrepreneurship in Nigeria. Drawing on data from the National Bureau of Statistics and the Central Bank of Nigeria (CBN), the study found that increased microfinance outreach was associated with higher rates of youth enterprise formation and employment creation, particularly in the technology and agribusiness sectors. This study advances the

literature by disaggregating entrepreneurial outcomes by age cohort, revealing that younger entrepreneurs derived relatively greater benefit from microfinance activities compared to older cohorts, possibly due to their higher propensity to adopt digital financial services.

In synthesising the foregoing studies, it is evident that there exists broad agreement in the literature that microfinance activities exert a positive influence on entrepreneurship development in Nigeria. Across diverse methodologies, from descriptive statistics to GMM estimation and PSM, the studies consistently identify improvements in enterprise formation, business survival, income generation, and employment creation as outcomes associated with microfinance participation. However, significant areas of disagreement and nuance emerge upon closer examination. While studies such as those of Arogundade (2010) and Nwaneri and Okereke (2012) offer relatively optimistic assessments, methodologically rigorous studies such as Okafor and Onuoha (2013) and Ehigiamusoe and Lean (2019) caution against overstating the impact of microfinance, pointing to loan diversion, regulatory failures, and macroeconomic confounders as factors that attenuate the developmental dividends of microfinance activities. The persistent issues of gender inequity in access, high interest rates, short loan tenures, and geographical exclusion form a negative findings thread that runs through the literature and defines the principal gap requiring policy and scholarly attention. More often, microfinance is seen from the standpoint of implementing the social responsibility of financial inclusion (see Ogbu, 2024)

The existing body of literature on microfinance activities and entrepreneurship development in Nigeria, while substantial, exhibits several critical gaps that the present study is designed to address. From the perspective of financial intermediation theory, a significant theoretical gap exists in its application to the Nigerian microfinance context: the theory's standard formulation presupposes institutional conditions including functional credit registries, enforceable contract law, and competitive financial markets that are only partially realised in Nigeria's microfinance environment, yet existing studies rarely examine how these institutional imperfections moderate the relationship between microfinance activities and entrepreneurial capital allocation. From the perspective of entrepreneurial finance theory, a notable gap is the theory's limited engagement with savings and investment dimensions of microfinance, with most Nigerian empirical applications focusing exclusively on the credit-entrepreneurship nexus and neglecting the independent developmental contributions of savings mobilisation and investment finance. Methodologically, the predominance of cross-sectional and short-panel studies in the Nigerian literature prevents robust causal inference about the long-run entrepreneurship development effects of microfinance activities, a limitation that the present study's twenty-five-year longitudinal design explicitly addresses. Furthermore, virtually no existing Nigerian study simultaneously examines the disaggregated effects of microfinance loans, savings, and investments on entrepreneurship development outcomes using a unified analytical framework, leaving a critical gap in comparative understanding of which microfinance activity dimensions generate the largest and most equitable developmental returns. These theoretical, methodological, and analytical gaps collectively constitute the scholarly lacunae that this study is designed to fill.

3. Methodology

Data were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), and the World Development Indicators (WDI) database. These sources are widely recognized for providing credible and consistent macroeconomic data. The CBN Statistical Bulletin (2025) served as the primary source, while the WDI database complemented the dataset where necessary. This study utilized time-series data to examine the effect of the predictor (independent) variables on the dependent variable, with a view to evaluating the relationship between microfinance activities and entrepreneurship development in Nigeria.

The structural form of the model is stated as equation below and followed the econometrics assessment of Chidinma, L.F., Yalouli, T., & Kalu, E.U. (2025).;

$Y = ƒ(x)$

Where Y is the dependent variables, ƒ is the functional and X represents independent variables.

The model was further expressed in mathematical equation (i) below;

$SMEGDP = ƒ(MFL, MFSAV, MFINV)$

The model specified above was adapted to reflect the time-series nature of this study, which is country-specific, and to allow for the inclusion of additional explanatory variables. Accordingly, the general model for the study is presented in its time-series form as shown below:

$SMEGDP_{t,=}\ \delta_o + \delta_1 MFL_{t-1} + \delta_2 MFSAV_{t-1} + \delta_3 MFINV + \ \mu_t$

All the variables are defined in equation 2 nevertheless the coefficients and other notations are explained below:

δ_o = constant or the intercept

δ_o - δ_3 = coefficients of the parameters or explanatory variables

μ_t = the residual or error term

All the variables are as defined above. The general model is uncoupled to show the respective models for testing the three (3) formulated hypotheses as presented below:

$$SMEGDP_t = \delta_o + \sum_{t=1}^{k} \delta_1 SMEGDP_{t-1} + \sum_{t=1}^{k} \delta_2 MFL_{t-1} + \sum_{t=1}^{k} \delta_3 MFSAV_{t-1} + \sum_{t=1}^{k} \delta_4 MFINV_{t-1} + \vartheta_1 SMEGDP_{t-1} + \vartheta_2 MFL_{t-1} + \vartheta_3 MFSAV_{t-1} + \vartheta_4 MFINV_{t-1} + \mu_t$$

δ_o = constant or the intercept

δ_o - δ_3 = coefficients of the short-run parameters or explanatory variables

ϑ_1 - ϑ_3 = coefficients of the short-run parameters or explanatory variables

μ_{it} = the residual or error term

The variables for this study were selected based on the literatures empirically reviewed by considering factors for microfinance activities and entrepreneurship development in Nigeria (2000-2025). The variables used in this current estimation are therefore explained below in a tabular form. This section presents a summary of all the variables description.

Table 1 Description of Model Variables

Symbol	Definition	Variable	Measurement	Literature Justification	Expected Signs
SMEGDP	Entrepreneurship Activities	DV	It is measured as new business registration rates, self-employment levels, and the Total Early-Stage Entrepreneurial Activity index.	WDI	NA
MFL	Microfinance Loan	IV	It is measured as the total value or volume of loans disbursed by microfinance institutions to individuals and small businesses within a given period.	CBN	+
MFSAV	Microfinance Savings	IV	It is measured as the total value of deposits mobilized by microfinance institutions from clients within a given period.	CBN	+
MFINV	Microfinance-Related Investments	IV	It is measured as the total funds allocated to microfinance institutions or programs, including equity, grants,	CBN	+

			and wholesale lending within a given perio.		

This study employs the Autoregressive Distributed Lag (ARDL) model, particularly the bounds testing approach, to examine both the short-run and long-run relationships among the variables, as well as causality. To ensure the validity and reliability of the estimation, preliminary tests (descriptive statistics, correlational analyses and unit root test) appropriate for time series data were conducted to assess the statistical properties of the variables. Post estimation tests (serial correlation, model stability, heteroscedasticity etc) were carried out to confirm the validity of the estimated results.

The main estimation technique adopted in this study is the Autoregressive Distributed Lag (ARDL) model. This approach was selected due to its suitability for handling variables with mixed orders of integration and its ability to estimate both short-run and long-run relationships simultaneously. Furthermore, the ARDL model is flexible in accommodating variable heterogeneity and is relatively robust in addressing potential endogeneity issues.

4. Results

The data for this study were presented in two stages. First, raw data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Development Indicators (WDI) database. To ensure uniformity of scale and reduce the impact of large variations, the variables were transformed into their logarithmic form. The log-transformed data are presented in Appendix I of the study.

Table 2 presents the descriptive statistics of the variables, including minimum and maximum values, mean, and standard deviation. It also reports measures of normality such as skewness, which captures the degree of asymmetry, and kurtosis, which indicates the peakedness or flatness of the distribution. In addition, the Jarque–Bera test is used to assess normality by comparing the observed skewness and kurtosis with those of a normal distribution.

Table 2 Summary of Descriptive Statistics

	SMEGDP	**MFL**	**MFSAV**	**MFINV**
Mean	58.26923	360.9231	414.1538	779.9231
Median	58.25000	195.0000	240.0000	350.0000
Maximum	65.00000	1600.000	1500.000	5200.000
Minimum	52.00000	12.00000	15.00000	20.00000
Std. Dev.	3.858058	423.1515	444.0128	1151.686
Skewness	0.029790	1.513674	1.100232	2.518602
Kurtosis	1.836847	4.531853	3.008377	9.602669
Obs	26	26	26	26

The mean value of Entrepreneurship Activities (SMEGDP) is 58.26923, maximum and minimum values of 65.00000 and 52.00000 respectively show that the variables had higher Entrepreneurship Activities (SMEGDP) levels during the study period. The standard deviation of 3.858058 also indicates that the Entrepreneurship Activities (SMEGDP) indicator deviates from the mean by 3.858058. Entrepreneurship Activities (SMEGDP) has a positive Skewness value of 0.029790. The Kurtosis has a positive value of 1.836847 which implies that the distribution is leptokurtic (peaked-curve) indicating that they are higher value that the sample means for this variable. The mean value of Microfinance Loan (MFL) is 360.9231, maximum and minimum values of 1600.000 and 12.00000 respectively show that the variables had higher Microfinance Loan (MFL) levels during the study period. The standard deviation of 423.1515 also indicates that the Microfinance Loan (MFL) indicator deviates from the mean by 423.1515. Microfinance Loan (MFL) has a positive Skewness value of 1.513674. The Kurtosis has a positive value of 4.531853 which implies that the distribution is leptokurtic (peaked-curve) indicating that they are higher value than the sample mean for this variable. The mean value of Microfinance Savings (MFSAV) is 414.1538, maximum and minimum values of 5200.000 and 20.00000 respectively show that the variables had higher Microfinance Savings (MFSAV) levels during the study period. The standard deviation of 444.0128 also indicates that the Microfinance Savings (MFSAV) indicator deviates from the mean by

444.0128. Microfinance Savings (MFSAV) has a positive Skewness value of 1.100232. The Kurtosis has a positive value of 3.008377 which implies that the distribution is leptokurtic (peaked-curve) indicating that they are higher value than the sample mean for this variable.

Lastly, the mean value of Microfinance-Related Investments (MFINV) is 779.9231, maximum and minimum values of 350.0000 and 5200.000 respectively shows that the variables had higher Microfinance-Related Investments (MFINV) levels during the study period. The standard deviation of 1151.686 also indicates that the Microfinance-Related Investments (MFINV) indicator deviates from the mean by 1151.686. Microfinance-Related Investments (MFINV) has a positive Skewness value of 2.518602. The Kurtosis has a positive value of 9.602669 which implies that the distribution is leptokurtic (peaked-curve) indicating that they are higher value than the sample mean for this variable.

Correlation analysis shows whether there exist relationship among the variable used. It shows the direction (positive) and magnitude (significance) between the variables under study and is presented in Table 3 below:

Table 3 Summary of Correlation Matrix

Probability	**MFINV**	**MFL**	**MFSAV**	**SMEGDP**
MFINV	1.000000			

MFL	0.964799	1.000000		
	17.97253	-----		
	0.0000	-----		
MFSAV	0.920409	0.987782	1.000000	
	11.53343	31.05202	-----	
	0.0000	0.0000	-----	
SMEGDP	0.779714	0.882024	0.919972	1.000000
	6.100599	9.170131	11.49771	-----
	0.0000	0.0000	0.0000	-----

First, given that the correlation "R" is (0.96) and the t-stat (17.97) which is higher than 2.5 and with an associate p-value of 0.0000 it therefore concludes that Microfinance Loan (MFL) and Entrepreneurship Activities in Nigeria (SMEGDP) shows a positive and significant linear association.

For Microfinance Savings (MFSAV) and Entrepreneurship Activities in Nigeria (SMEGDP) the correlation "R" is (0.92) and the t-stat (11.53) which is higher than 2.5 and with an associate p-value of 0.0000 it therefore concludes that Microfinance Savings (MFSAV) and Entrepreneurship Activities in Nigeria (SMEGDP) shows a positive and significant linear association.

Lastly for Microfinance-Related Investments (MFINV) vs Entrepreneurship Activities in (SMEGDP) given that the correlation "R" is (0.78) and the t-stat (6.10) which is higher than 2.5 and with an associate p-value of 0.0000 it therefore concludes that Microfinance-Related Investments (MFINV) and Entrepreneurship Activities in Nigeria (SMEGDP) shows a positive and significant linear association.

The stationarity properties of the series are shown in table 4.

Table 4 Summary of Unit Root Results (ADF Test)

Variables	t-statistics	Critical Values @5%	Order of Integration	Prob.	Remarks
SMEGDP	(3.425358)	(2.998064)	I(1)	0.0205	Stationary
MFL	(5.163002)	(3.644963)	I(1)	0.0022	Stationary
MFSAV	(6.657727)	(3.622033)	I(0)	0.0001	Stationary
MFINV	(1.1987667)	(1.955681)	I(0)	0.0467	Stationary

Source: E-View 10.0 Output, 2026.

The results reveal that the variables are integrated at both level and first difference, indicating a mixture of I(0) and I(1) series. Based on this outcome, the Autoregressive Distributed Lag (ARDL) model is considered the most appropriate estimation technique.

The result from the main estimation technique is of the form reported in table 5.

Table 5 Summary of ARDL Estimates

Variable	Coefficient	Std. Error	T-Statistic	Prob.*
Short-run Estimate				
LOG_MFL	0.010807	0.006264	1.725243	0.1082
LOG_MFSAV	1.117960	3.269688	0.341916	0.7379
LOG_MFINV	0.004507	0.003859	1.167982	0.2638
C	0.050737	0.096452	0.526032	0.6077
Long-run Estimate				
LOG_MFL	0.014933	0.003139	4.757875	0.0004
LOG_MFSAV	0.015689	0.006513	2.408978	0.0316
LOG_MFINV	-0.012221	0.003971	-3.077576	0.0088

	Bounds Test			Asymptotic: n=1000	
	F-statistic	44.64556	10%	2.37	3.2
	K	3	5%	2.79	3.67
			2.5%	3.15	4.08
			1%	3.65	4.66

DIAGNOSTIC TESTS				
BG_ LM Test	F-statistic	0.386209	Prob. F (2,11)	0.6885
	Obs*R-squared	1.574701	Prob. Chi-Square (2)	0.4550
BPG – HET Test	F-statistic	1.573747	Prob. F(0, 13)	0.2188
	Obs*R-squared	13.14310	Prob. Chi-Square(7)	0.2158
Ramsey Reset Test	T-Statistic 0.985538 Prob. 0.3438 F-Statistic 0.971284 Prob. 0.3438			

Source: E-View 10.0 Output, 2026.

The results for the Bounds test in Table 5 above reveal that there is a long run relationship among the variables. This is because the F-statistics value (44.64556) is greater than upper Bounds critical values at 3% level of significant, and thus the null hypothesis of no cointegration is rejected.

A test of Autocorrelation (serial correlation) is conducted to check if the error terms of the variables are correlated, as shown in table 5. The summary of Breusch-Godfrey Serial Correlation LM result in table 5 shows the values of F-statistics and Chi-square of 0.39 and 0.69 respectively. With a null hypothesis of no serial correlation, we fail to reject the null considering the results of the F-stat 1.57 and X^2 0.5 both greater than the 5% level of significance.

A test of heteroskedasticity is conducted to ascertain the homoskedastic or heteroskedatic nature of data for the study. The summary result in table 5 shows the F-statistics value of 1.57 with a corresponding observed R-square probability value of 0.22, both greater than the 5% level of significance. Hence, the study fails to reject the hypotheses of no heteroskedasticity. The results simply indicate that the data for analysis is all homoskedastic. The Ramsey RESET test results presented in Table 5 provide an important diagnostic check for possible model misspecification in the estimated Autoregressive Distributed Lag (ARDL) model. The results show a t-statistic of 0.99 and an F-statistic of 0.97, with corresponding probability values of 0.3438, which are higher than the conventional 5% level of significance. This outcome indicates that the model is correctly specified.

In discussing the obtained results, it is found Microfinance Loan has a positive coefficient of 0.14 and a t-statistics value of 4.76 implying that it positively and significantly affects entrepreneurship activities in Nigeria at 5% level of significance. This implies a unit increase in Microfinance Loan would lead to increase in Entrepreneurship Activities in Nigeria. Microfinance loans should be distributed in a fair, transparent, and inclusive manner to individuals and enterprises that genuinely require financial support for productive purposes. When credit allocation is equitable, it reduces financial exclusion and ensures that aspiring and existing entrepreneurs particularly those at the grassroots level, are not deprived of the capital needed to start or expand their businesses. An efficient and well-targeted microfinance system builds confidence among potential entrepreneurs, as the assurance of access to funding serves as a strong incentive to venture into business activities. This, in turn, promotes enterprise creation, enhances innovation, and contributes to broader economic development through job creation and income generation. Over time, entrepreneurs who benefit from microfinance loans are better positioned to invest in productive assets, adopt improved technologies, expand their scale of operation, and diversify their income streams. These long-run effects highlight the importance of not only providing access to credit but also ensuring its continuity and adequacy to support business growth and sustainability. This finding is consistent with the empirical findings of Onwumere et al. (2012) and Eniola and Entebang (2015). However, the findings are not in agreement with those of Okafor and Onuoha (2013).

For microfinance savings there is a positive and significant effect on entrepreneurship activities in Nigeria. A unit increase in microfinance loans, expands entrepreneurship activities by 1.5units. This implies that in the long run, a unit increase in Microfinance Savings would lead to increase in Entrepreneurship Activities in Nigeria. Microfinance banks must priorities effective savings mobilization as a fundamental strategy for sustaining their lending capacity and promoting entrepreneurship development. By encouraging a strong savings culture among clients and the wider public, microfinance institutions are better positioned to accumulate internal funds that can be channeled into productive lending. Adequate savings mobilization not only enhances the liquidity and stability of these institutions but also ensures a continuous flow of credit to deserving borrowers, particularly micro and small-scale entrepreneurs who often lack access to conventional banking services. In this regard, savings serve as both a source of loanable funds and a mechanism for strengthening financial inclusion, thereby creating a supportive environment for entrepreneurial activities to thrive. Entrepreneurs who actively participate in savings programmes are more likely to accumulate capital for reinvestment, improve their financial discipline, and enhance their creditworthiness, all of which are critical for business growth. Over time, this fosters a virtuous cycle in which savings lead to increased access to credit, which in turn stimulates entrepreneurial productivity and economic development. This findings align with the a-prior expectations of this study. This finding is also consistent with the findings of Akpan and Nneji (2015) and Umar and Dahiru (2020). However, the findings is not consistent with the findings of Idowu and Salami (2011).

The study found that a unit increase in Microfinance-Related Investments would lead to a decrease in entrepreneurship activities in Nigeria by 2%. Microfinance-related investments must be carefully designed, rigorously evaluated, and strategically implemented to ensure that they generate meaningful value and sustainable returns for both financial institutions and entrepreneurs. For such investments to be effective, they must be directed toward viable business opportunities that demonstrate strong potential for growth and resilience. This requires that microfinance institutions undertake thorough feasibility studies, risk assessments, and due diligence processes before committing funds. Proper appraisal of investment opportunities taking into account market conditions, managerial capacity, sectoral dynamics, and repayment prospects is essential to avoid misallocation of scarce financial resources. Without these safeguards,

microfinance investments may fail to deliver their intended developmental outcomes and could even undermine entrepreneurial progress. This finding is not consistent with the findings of Bassey and Etting (2016) and Babajide et al. (2015). However, the findings are consistent with the findings of Ogbe and Akobundu (2014).

5. Conclusion

This study examined the impact of microfinance activities on entrepreneurship development in Nigeria over the period 2000–2025, with specific focus on microfinance loans, savings, and investment-related activities. The findings provide clear evidence that microfinance plays a significant role in shaping entrepreneurial outcomes, although the effects vary across its components. The results reveal that microfinance loans and savings exert positive and significant long-run effects on entrepreneurship activities, highlighting their importance in facilitating business creation, expansion, and sustainability. Access to credit enables entrepreneurs to invest in productive ventures, while savings mobilisation strengthens financial discipline, capital accumulation, and creditworthiness. In contrast, microfinance-related investments were found to have a negative and significant effect, suggesting the presence of structural inefficiencies, poor investment targeting, or misalignment between investment frameworks and entrepreneurial needs. Overall, the study concludes that while microfinance remains a vital tool for promoting entrepreneurship development in Nigeria, its effectiveness depends on the efficiency, inclusiveness, and strategic orientation of its delivery mechanisms.

The study thus recommended that policymakers and microfinance institutions should strengthen credit delivery mechanisms by ensuring equitable, timely, and affordable access to loans. This can be achieved through improved credit appraisal systems, reduced collateral requirements, and the introduction of flexible repayment structures that align with business cash flows. Also, microfinance institutions should intensify efforts toward savings mobilization by introducing attractive, flexible, and accessible savings products. Microfinance institutions should adopt rigorous feasibility studies, proper risk assessment frameworks, and continuous monitoring mechanisms before and after investment decisions.

The study extends existing literature by disaggregating microfinance into its core components and revealing that while loans and savings positively drive entrepreneurship, microfinance-related investments may exert a negative effect due to structural and institutional inefficiencies. The study also enriches methodological discourse through the application of the ARDL framework, offering robust insights into both short-run and long-run dynamics, thereby informing policy and future research on financial inclusion and entrepreneurial development.

Future studies should explore sector-specific impacts of microfinance activities on entrepreneurship, particularly in agriculture, manufacturing, and the digital economy. Further research can also incorporate primary data and behavioural factors such as financial literacy and loan utilisation patterns, as well as examine the role of institutional quality and regional disparities in shaping microfinance effectiveness in Nigeria.

Compliance with ethical standards

Disclosure of conflict of interest

The Authors have no known conflict of Interest

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