



Do Micro Finance Institutions Reduce Poverty in Nigeria? Evidence from the Credit Intermediation Transmission Channel

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Abstract

Microfinance credit is a viable and strategic poverty-reducing tool in the financial architecture. It is on this premise the study empirically assesses the effect of microfinance institutions on poverty reduction in Nigeria, using the evidence from the credit intermediation transmission channel, over the period 1992-2018. Employing the techniques of Cointegration and dynamic error correction modeling (ECM), the empirical results show evidence of a short-run dynamic and a long-run equilibrium relationship exists between the microfinance activities and poverty reduction in Nigeria. In particular, the results show that the microfinance deposit, micro finance credit, agricultural production, and government expenditure on economic and social infrastructure have significant effect on poverty reduction in Nigeria. It is also evident that microfinance investment has a positive but weak effect on poverty alleviation. Therefore, the policies to enhance microfinance activities through efficient credit intermediation to the real sector should be put in place. Increased government expenditure on critical economic and poverty-reducing infrastructure is also important. Sound and stable macroeconomic policies and supporting institutional and regulatory structures are also imperative to reduce poverty to sustainable levels in Nigeria.

Keywords: Microfinance Banks, Credit Intermediation Transmission Channel, Poverty, ECM

JEL Classification: G21, I32, C13

Paper Classification: Research Paper

Introduction

There is an increased empirical research concerning the role of microcredit as an instrument for stimulating economic growth, particularly, substantial poverty reduction. Microcredit has been identified as one of the most cost-effective and promising economic tools for drastically reducing poverty (Daley-Harris, 2005). Access to financial services which is an integral part of Financial Inclusion Strategy (FIS) is one of the critical components of the strategies that are aimed at reducing poverty.

The microfinance institutions, represent a tactical approach geared towards the improvement of socio-economic wellbeing of the deprived, who characteristically are self-employed low income

entrepreneurs, like traders, street hawkers (vendors), subsistence farmers, coiffeurs, barbers, GSM commercial operators, artisans, and including many others. These people lack access to required financial services from the deposit money banks because of their inability to provide the appropriate collateral security. Several economically productive poor who run micro enterprises and small business lack access to adequate financial service, hence; the microfinance banking has evolved as a robust economic development mechanism envisioned to benefit the low-income people (CBN, 2013).

The microfinance institutions constitute critical credit source to agriculture particularly in developing countries like Nigeria, Pakistan, Bangladesh, etc., due to their offer of small advance loans and or savings, lack of asset-based collateral, in addition to simplicity of operations. The microfinance plays a critical role in farm production, as it constitutes the bedrock upon which increased food production and employment rest, especially for these countries where agriculture constitutes a major part of developing countries' GDP and employment generation, particularly the rural populations.

Given the debilitating poverty in Nigeria and the quest to significantly reduce poverty to barest minimum, as encapsulated in the Millennium Development Goals (MDGs), the place of financial empowerment to enable people engage in meaningful economic ventures through the microcredit cannot be over-emphasized. Through microcredit, the latent entrepreneurial capabilities of the large segment of the people is sufficiently stimulated and sustained, leading to substantial poverty reduction employment creation. Suffice to say, in this regard, that the microfinance through its credit intermediation channel can significantly enhance economic incentives, develop and create enterprise which can reduce poverty to a sustainable level. In the light of the critical role of credit in the stimulation of productive economic activities, entrepreneurial spirit, creative and innovative endeavors that can reduce poverty, there is a need to investigate the empirical nexus between the microfinance bank and poverty reduction, using the evidence from their credit intermediation role.

Literature Review

Conceptual Issues

Fundamentally, microfinance involves the provision of financial services to micro-entrepreneurs and small businesses that lack access to traditional banking, as well as related services on account of high transaction costs that are associated with serving these client categories. It is a mechanism that provides access to financial services such as credit, savings, micro-insurance, remittances, leasing to low income clients, in addition to consumers and self-employed who lack access to formal deposit money banking and related services (Roadman, 2012).

In line with Osamwonyi and Obayagbona (2012), microfinance involves building efficient financial systems that function to meet the requirements of the poor. It involves providing wide-ranging financial services that include savings, loans, payment services, transfer of money, insurance to the poor, as well as persons with low income, households, in addition to their microenterprises(CBN,2013). Through the microfinance, clients can protect, diversify and increase their incomes, in addition to accumulating assets that reduce their vulnerability to income and consumption shocks. To this end, it entails providing small loans (microcredit) to the poor, which allow them to take part in economically productive activities or nurture and develop their businesses. It is a critical tool for the enhancement of economic growth, employment creation and poverty reduction through the support of entrepreneurial initiatives and small-scale enterprise.

Obukowo (2014) posits that the microfinance services and microcredit enable the poor to deal with emergencies as they arise and make investment expenditures. He further asserts that the major aim of promoting the microfinance business and activities is to offer cost-effective financial services specifically targeted towards the needs of the poor sections of the economy.

In a bid to stem the apparent dislocation and lack of access to finance in the conventional banking system, particularly the economically vulnerable in the society, the idea of microfinance institution was developed. These institutions are tasked with the primary responsibility of providing or meeting the financial needs of the informal sector comprised mainly of individuals, who include; micro-entrepreneurs and small businesses that are unable to access the formal banking services due to the high transaction costs linked to serving poor clients. By developing microfinance structures, the poor and vulnerable sections of the population can be integrated into the economic cycle through its various financial access mechanisms and financial inclusion. This is hinged on the need to offer broad, differentiated range of products and services in small scale, including loans, savings services, insurances and cashless transactions (Obukowo, 2014). This is against the background that substantial poverty reduction and eradication are unrealistic without well-articulated programmes and strategies to reduce poverty that empower the people through increased access to credit and finance. The latent capacity of the poor for entrepreneurship and productive economic initiative is significantly enhanced by providing microfinance services that give them opportunity to engage in realistic and productive economic activities that will enable them become greatly self-reliant, through the creation of employment opportunities, increased household income, wealth creation and overall, significantly eradicate poverty.

Theoretical Literature

Microfinance, Financial Frontier and Poverty Reduction Nexus

All economic system comprises surplus and deficit units (individual, as well as businesses). An economic unit is usually unable to deliver the required funds, at every instance, a situation which creates deficit. Such economic unit will, therefore, require credit facilities (through credit intermediation) to carry out its activities. Financial intermediation exists as a means by which surplus units are linked to the deficit units. By the conscious activities of financial intermediaries, which involves banks, financial (credit) intermediation is made possible. Primarily, commercial banks are deposit-taking institutions that channel resources to the real sector. They represent traditional or conventional source of credit intermediation. Channeling deposits from the informal sector to the formal sector characteristically entails movement of capital from the informal sector. The movement of capital, in addition to commercial banks unwillingness to give loans and advances to the sector on account of huge collateral requirements, exorbitant interest rates and other forms of credit constraints make it difficult for the deficit informal economic units to access credits. This situation leads to the creation and perpetuation of an informal credit market. By creating an informal money (credit), the idea of the financial frontier is created (Onyebinama & Onyebinama, 2012).

As a market-based concept, the financial frontier, represents the phase that subsists between the formal and informal sector (Von Pischke, 1991, cited in Onyebinama & Onyebinama, 2010). The activities of the formal financial institutions are limited to that of the frontier. The frontier embeds the formal sector which consists of conventional intermediaries that are regulated and supervised by government, while the outside frontier consists of participants in the informal sector, small scale or subsistence farmers and businesses that have personalized financial transactions, devoid of intermediaries. Basically, credit is usually scarce, otherwise, exorbitant

or both. Several participants and activities not within the frontier remain mostly rural based and subsistence oriented. The expansion of the frontier is a direct outcome of Financial Inclusion Strategy (FIS) which is an integrated process that enables the financially excluded access credit facilities hitherto not possible under the conventional or formal financial system. It entails the enlargement of the formal sector, as well as informal sector contraction (constriction). It involves incorporating the informal sector within the main-stream national and international financial system.

An expansion of the frontier is brought about when the poor, in addition to other micro economic units have initial direct interaction, in addition to sustainable interface with the conventional financial system. For institutions and innovations to be able to enlarge the frontier, they must, as a matter of fact, be sustainably successful. The local money lenders, rotating credit cooperatives, as well as community savings and loans associations, which are informal institutions have greater innovative and receptive tendency to borrowers' needs, in addition to greater accessibility when compared to banks as well as other formal institutions, particularly in rural areas. They also have lower cost of lending in their relationship (interface) with small scale farmers, as well as micro enterprise owners (Von Pischke, 1991; cited Onyebinama & Onyebinama, 2010).

By mobilizing savings and translating them into credit, which are channeled into genuine productive ventures, the informal financial markets create productive enterprises and employment that are innovative and economically and socially worthwhile to reduce poverty. Micro-financing is, thus, a veritable tool for the enterprise creation, employment and poverty eradication (Akinduntire, 2008). The role of these institutions encompasses a wide range of the economic life. Their capacity to make socio-economic equity (poverty reduction) possible by their conscious activities to the financially excluded by the formal (conventional) financial services represents a genuine basis for the focus and importance attached to them in developing economies. Although in Nigeria, MFI's are confronted with problems of inadequacy of funds, that hinders their resolve and capacity to grant sufficient loans to small businesses, nevertheless, their proclivity and capacity to enhance the financial needs of this sector through enterprise creation, employment generation, in addition to significant poverty reduction, particularly in the rural sector is considerably acknowledged (Acha, 2012).

Strategically, micro finance banks are established to give greater financial access to the financially excluded (less financially-reached), and by doing so, encourage the exploitation and development of economic opportunities resident in the informal sector, by way of delivering non-conventional banking services, like micro credit that are easily accessible, technical and managerial support, output sale, input purchase financing, machinery, as well as equipment leasing, in addition to the financing of community development projects, all of which significantly help in poverty reduction.

Empirical Literature

Narayan and Patesch (2002) find that microcredit constitutes a viable tool for entrepreneurial development, employment generation and stimulation of economic activities. Daley-Harris (2005) investigates the role of microfinance in economic activities. His findings reveal that microcredit is a significant promising and cost-effective tool for global poverty reduction.

Littlefield, Murdoch & Hashemi (2003) examine whether microfinance represents an effective design (structure) that will enable the attainment of the Millennium Development Goals (MDGs). The findings suggest that apart from reducing poverty, improvements in health care, improve

nutrition and education are sustainable only if households have increased earnings and greater control over financial resources, that access to microfinance facilities guarantee.

Ketu (2008) examines the link between microfinance and economic activities in Nigeria. The empirical results reveal that the loans and advances have significant poverty-reducing effect. The findings show that microfinance banks loans and advances tend to boost investment, increase productivity and income, leading to poverty reduction. In line with his findings, increased microfinance credit will stimulate agricultural output, as well other small and medium scale enterprises in Nigeria, creating employment, as well as significantly reducing poverty.

Ojo (2009) evaluates the link between microfinance bank and entrepreneurial development in Nigeria. Using a survey research design, the empirical results show evidence of a positive and significant relationship between microfinance banking and entrepreneurial development, which creates employment and reduces poverty in Nigeria.

Vetrivel and Kumarmangalam (2010) use a descriptive approach to discuss the structure, workings and basis of microfinance institution by evaluating the successes and failures of several microfinance institutions, and incorporating the relevant lessons learnt in a model of microfinance banking structure for India. The authors posited that microfinance banking has the capacity to ameliorate the challenge associated with inadequate housing, as well as urban services which are fundamental components of any programme or strategy designed to alleviate poverty. The authors, further, maintained that the solutions involve finding a flexibility level in the credit instrument that will be compatible to the multiple credit needs of small borrowers, without inflicting high monitoring and tracking costs on its final users. According to them, an appropriate solution lies in providing multiple and disaggregated credits tied to the needs of varying income levels, housing and consumption needs of the people such that it reduces poverty. Consumption loan is exclusively important when the maturity period relating to new economic activity and the generation of income from the activity differs.

Onyebinama and Onyebinama (2010) evaluate micro finance banks' effect on the expansion of accessibility to financial services (financial frontier), including the utilization, as well as economic development opportunities in Nigeria's informal sector. The empirical results indicate that as a result of mobilization of deposits, in addition to the provision of credit, the micro finance banks have witnessed robust expansion in the financial frontier, which has meaningfully incorporated informal sector activities into the formal (mainstream) national financial system, thus contributing to the informal sector's transformation from a subsistence orientation to market orientation. These, in no small measure, according to the authors, have led to poverty reduction in Nigeria. Against the backdrop of this finding, the authors recommend that in order to make the impact of microfinance sustainable, there is a need for greater institutional strengthening, with respect to qualified and capable manpower, managerial effectiveness, as well as improved capital base. They also recommend need for the implementation of supporting and favourable policies, as well as efficient operational guidelines besides sound correspondent relationship with commercial banks.

In examining the role of microfinance banks in the Nigerian economy in the context of sectoral output, Olakojo and Olanipekun (2011), made use of OLS pooled regression estimation technique, using annual time series data for the period 1992-2008. The estimates show a positive relationship between the current level of sectoral output and loans and advances in the banking sector. Nevertheless, the OLS results, using a sectoral analytical approach, show that whereas microfinance loans and advances positively influence manufacturing output, building and construction, mining and quarrying sectors, the same could not be established for the agricultural sector. In their suggestion, community/microfinance banking has a vital impact on the economy,

given that apart from providing financial assistance to small and medium scale enterprises, it also helps to drive real sector growth, thus promoting economic growth in Nigeria.

Ibe (2012) examines the impact of informal financial institutions on entrepreneurial and investment development in Nigeria. Using a disaggregated sectoral model, he found that the micro finance banks through credit allocation have positively and significantly driven agricultural productivity and other micro enterprises, thereby contributing to the reduction of poverty in Nigeria. Iwaye (2012) examines the impact of microfinance banks on SMEs in Nigeria. Analyzing the responses from 110 small business owners and micro entrepreneurs in the Lagos State with descriptive statistics, the findings show that micro finance banks have significantly aided the reduction of unemployment and poverty, through the financing of micro-business.

Acha (2012) theoretically examines the critical challenges facing microfinance banking in Nigeria from its inception by scanning the business environment in order to assess its prospects in Nigeria. He suggests that microfinance banking in Nigeria is subjected to enormous constraints ranging from inadequacies in infrastructure, social misconception, feeble legal and regulatory structures, uncontrolled competition from other financial institutions, relinquishment of the fundamental function of microfinance, as well as shortage of skilled manpower. Notwithstanding these challenges, the author enumerated several dimensions of opportunities for microfinance bank to include growing level of entrepreneurial awareness, improved government concern, large proportion of financially excluded (the less financially reached) and huge number of micro-enterprise-oriented population. The study recommends appropriate interventions from the regulatory authorities, as well as relevant stakeholders' commitment to the important business that microfinance is concerned with.

Employing the financial constraints methodology, Oladejo (2013), citing Babajide (2011b) investigate whether microfinance institutions stimulate credit accessibility for microenterprises in Nigeria. Accordingly, microenterprises that have greater access to credit have lesser degree of dependence on internal funds for investments. Using this approach, the investment sensitivity of internal funds of micro enterprises in the Lagos State (a municipal that has significant presence of Microfinance Banks (MFBs) was compared to that of micro enterprises in the Ekiti State (a municipal with no or limited presence of MFBs) in a cross-sectional framework survey, where the microfinance institutions (MFI) branch location data is utilized. The empirical findings show that MFBs alleviated the financing constraint of micro businesses, and inadvertently encourage economic growth and development in Nigeria. This approach is applicable to evaluating the impact of microfinance on the growth process in other countries cited in Osamwonyi and Obayagbona (2012).

Madiha and Tanveer (2013) empirically investigate the impact of microfinance bank entrepreneurship development in Pakistan. Employing primary data through the collation of interviews from 150 microfinance bank clients and analyzing the these through the use of descriptive statistical tool and non-parametric test (Kruskal-Wali and Manny-Whitney test), the results indicate that the microfinance institutions play a significant role in the entrepreneurship development in the Gujrat district (Pakistan), and that clients who took loans from Tameer bank used it to establish small scale thereby enhancing the economic growth and poverty reduction.

The influence of microfinance bank loans on the growth of small and medium scale enterprises (SMEs) as engine of economic growth and poverty reduction in Nigeria is examined by Olowe, Moradeyo & Babalola (2013). The results show a positive but not significant effect of microfinance on SMEs. This implies an insignificant effect on poverty reduction.

The effect of the microfinance bank on the socioeconomic living standard of commercial motorcycle riders in Ilorin-west Local Government Area of Kwara State, Nigeria is examined by Ajagbe and Bolaji (2013). Employing simple random technique using questionnaire survey, the findings revealed the existence of a significant relationship between the microfinance bank credit and poverty reduction. Kolawole (2013) examines the role of microfinance in Nigerian economy. His findings show that the microfinance contributes substantially to the growth of small and medium scale enterprise (SME's) and other productive enterprises which are critical to employment generation and poverty reduction.

Mendez and Waithaka (2014) using evidence from Mexico examine the operation of microfinance institutions in relation to poverty. The findings show that the microcredit programmes of microfinance institutions has unintended paradoxical consequences for the beneficiaries. The findings show that inability to access microfinance credit is one of the causes of impoverishment, particularly for those at the lower rung of the ladder (extremely poor).

Ademola and Arogundede (2014) assess the effect of microfinance on Nigeria's economic growth and development. The study particularly sought to examine the fundamental role that microfinance institutions play in the reduction of poverty through small scale enterprise financing. Employing OLS multiple regression technique, the findings reveal that the microfinance activities significantly reduce poverty in Nigeria. The authors conclude that increased credit channeling to the real sector by microfinance institutions will enhance economic growth, contribute to employment generation and significantly to poverty reduction.

Obukowo (2014) submits that access to financial services constitutes a critical component of the strategies that are aimed at eradicating the debilitating scourge of poverty. He further averred that increased microcredit to the poor gives them numerous economic opportunities to explore their productive and entrepreneurial spirit, which contributes to eradication of poverty.

Igbinovia and Okoye (2017) examine the factors critical to entrepreneurial development in Nigeria. They used a cross sectional survey research design, with data collected from 140 respondents through questionnaire from entrepreneurs dealing in poultry, fish farming, bakery/confectioneries, sachet water production, transportation companies, canopy and chairs rental services and general buying and selling SMEs. The results from OLS show that poor access to credit finance amongst other constraints negatively and significantly affects entrepreneurship. Based on the findings, they recommend the implementation of policies that will encourage access to bank credit, particularly micro finance institutions for entrepreneurial activities to enhance the performance of SMES for sustainable poverty reduction in Nigeria.

In a study, Stanley and Clement (2018) explore the role of microfinance institutions, in terms of providing solutions to poverty reduction, as well as economic growth in Nigeria. Cointegration and error correction techniques were applied using annual time series data covering the sample period 1992-2016. Results from the analysis disclose that microfinance assets have significant poverty-reducing effect, in addition to enhancing economic growth. The analysis further shows a positive but not significant relationship between deposit liabilities of microfinance banks and poverty alleviation. The effect of loans and advances on poverty alleviation and economic growth, on the other hand, is negative and insignificant. The study suggests the need for government to provide a favourable, safe and stable environment that will encourage microfinance banks in the delivery of micro credit to enhance growth and contribute to poverty reduction in Nigeria.

Ola (2019) investigated the performance sustainability of micro finance banks with respect to unemployment in Nigeria. Employing the Auto regressive distributed lag approach (ARDL) with

annual time series data covering the 1991-2016 period, the results show that the microfinance banks have had no significant effect on unemployment reduction in Nigeria, due to poor financial intermediation to the real sector economy in terms of productive investment. Against this backdrop, the author recommends that the Central Bank of Nigeria (CBN) put in place appropriate monetary policies and strategies to encourage real sector financial intermediation in order to reduce unemployment in Nigeria.

Methodology

This section specifies a model to address the issue of the linkage between microfinance activities and poverty, against the backdrop of an appropriate theoretical framework, and then explains the estimation techniques.

Theoretical Framework and Model specification

In order to examine the nexus between micro finance bank activities and poverty through the growth channel, the endogenous growth model is adopted, where growth is linearly dependent on capital, labour, augmented with financial development variables and government expenditure on economic and poverty-reducing infrastructure. Following Levine (1997), Easterly and Levine (1994), Elbadawa and Ndulu (1996) and King and Levine (1993), financial variables are included as determinants of growth and poverty reduction, particularly in the context of efficient financial services and credit intermediation to the real sector, which enhances productive and poverty-reducing economic activities. This relationship is specified through the aggregate production function:

$$Y=AF (K,L) \dots\dots\dots (1)$$

Where:

Y = Output

K = Capital

L = Labour

A = Shift parameter which represents financial development

The aggregate production function in (i) shows that output is not only a function of productive factors, namely, capital and labour, but financial development variables. By introducing growth rates, equation (2) is:

$$\frac{dY}{Y} = \frac{dA}{A} + \alpha_k \frac{dK}{K} + \alpha_1 \frac{dL}{L} \dots\dots\dots (2)$$

Equation (2) depicts the growth rate of real output, growth rate of capital (investment) and financial development. This implies that the level of financial development presumably affects efficiency growth rate and hence, economic growth.

For the purpose of the study, the equation above is modified and expanded to accommodate the indicators of micro finance bank activities, as well as other variables that have the capacity to substantially reduce poverty, such as agricultural production, which also constitute the main channel of poverty reduction, as well as the transmission mechanism through which microfinance banks extend their credit. Substituting these variables into equation (1) above, the augmented modeling in its functional form is specified as:

$$PI=f (MFD, MBC, INV, AGQ, GEXP,) \dots\dots\dots (3)$$

In econometric form, the model above can be stated as:

$$PI = \alpha_0 + \alpha_1 MFD + \alpha_2 MBC + \alpha_3 MGINV + \alpha_4 AGQ + \alpha_5 GEXP + \varepsilon_t \dots\dots\dots (4)$$

PI = Poverty index-a measure of the incidence of poverty

MFD = microfinance bank deposit mobilization

MBC = Microfinance banks’ credit to the economy (as percentage of GDP)

MFINV = Investment (real gross domestic capital formation) to GDP ratio

AGP = Agricultural production (Output)

GEXP = Government expenditure on economic infrastructure

ε_t = Stochastic error term at time t

GEXP is included as a control variable to capture the impact of government expenditure on critical economic infrastructure and other poverty-reducing expenditures.

Apriori expectation, $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5 > 0$

The associated error correction model can be specified as:

$$PI = \alpha_0 + \alpha_1 \Delta MFD_{t-1} + \alpha_2 \Delta MBC_{t-1} + \alpha_3 \Delta MFINV_{t-2} + \alpha_4 \Delta AGQ_{t-1} + \alpha_5 \Delta GEXP_{t-1} + \Delta ECM_{t-1} \dots\dots(5)$$

Where the respective variables with subscripts tt-1 represent their lagged components and ΣECM t-1 represents the error correction model, depicting the adjustment speed to long-run equilibrium after temporary disequilibrium or perturbation.

Estimation Technique and Sources of Data

The estimation is done with annual data covering the period, 1992 –2018 and the technique used involves three steps. The first is the conduct of preliminary unit root test on the time series variables to determine their stationarity or otherwise, as non-stationary series may produce spurious and nonsense parameter estimates (Engle & Granger, 1987). Next, co-integration test was carried out to determine if a long-run equilibrium relationship exists among the variables. The presence of co-integration is tested using the Johansen (1988) approach. Finally, Error Correction Model (ECM) is used to represent the long-run (static) and short-run (dynamic) relationship among poverty index (incidence of poverty), microfinance credit and other variables. The ECM is appropriate in estimating the effect of microcredit and other variables on poverty. In addition, it enables the determination of the adjustment speed from short run equilibrium to long run equilibrium. In theory, the greater the coefficient of the ECM, the greater (faster) the adjustment speed of the model from short run to long run equilibrium. All the data except Poverty Index are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin (various issues). Data on poverty index is obtained from the World Development Index (online).

Empirical Results and Analysis

Unit Root Analysis

The unit root test (i.e. stationarity status) is conducted using the Augmented Dickey Fuller (ADF) test. The results are presented in levels and first difference forms in Tables 1 and 2, respectively. The ADF test statistic for each of the variables is shown in the second column of the tables, while the 95 percent critical ADF value is shown in the third column. The results in Table 2 indicate that the respective variables possess ADF statistics that are less than the 95 percent critical ADF value (in absolute terms). Thus, the time series are non-stationary in levels. Accordingly, the variables are time-dependent and cannot guarantee a long run relationship unless tested.

Table 1: Unit Root Test for Variables in levels

Variables	ADF Test Statistic	95% Critical ADF Value	Remark
PI	-1.072	-2.9907	Non-Stationary
MFD	-1.806	-2.99807	"
MFC	-1.998	-2.9907	"
MFINV	-1.072	-2.9907	"
AGP	-1.095	-2.99907	"
GEXP	-1.832	-2.99907	"

Source: Author's computation

Following Box and Jenkins' (1978) contention that non-stationary time series in levels may be made stationary by first differencing, the first differences of the variables are taken and the unit root test on each of the resultant time series is conducted. The results of the unit root tests in first differences are presented in Table 4. The result show that the ADF test statistic for the respective variables exceeds the 95 percent critical ADF values (in absolute terms). The implication of this is that the variables are stationary in first difference form, and hence, possess unit roots. They are thus, integrated of order one (i.e. $I[1]$).

Table 2: Unit Root Test for Variables in First Difference

Variables	ADF Test	95% Critical ADF Value	Order of Integration	Remark
D(PI)	-5.119	-2.9970	1(I)	Stationary
D(MFD)	-4.884	-2.9970	1(I)	"
D(MFC)	-4.790	-2.99970	1(I)	"
D(MFINV)	-5.242	-2.9970	1(I)	"
D(AGP)	-5.185	-2.9970	1(I)	"
D(GEXP)	-4.690	-2.9970	1(I)	"

Source: Author's computation

Co-integration Test

Given that all the series in the analysis are $I(1)$ variables, (i.e. possessing unit roots,) there is need to determine their co-integration status. The result of the Engle and Granger co-integration test is presented in Table 3.

Table 3: Results of Engle and Granger Residual Based Cointegration Test

Variable	ADF Test Statistic	95% Critical ADF Value	Remarks
Residual	-7.772	-5.250	Stationary

Source: Author's computation

As can be seen from the Table 3, the ADF test statistic is (-7.772). These values exceed the 95 percent critical ADF value of -5.250 (in absolute terms). The indication is that the residuals are stationary. Certainly, there is significant cointegration among the variables, implying that a long-run equilibrium relationship exists among the variables.

Error Correction Model

The confirmation of the existence of a co-integrating vector among series gives enough background for carrying out short run dynamic adjustment. Therefore, proceeding to estimate the dynamic Error Correction Model (ECM) shows the dynamic response of poverty to microfinance bank credit and other poverty-reducing variables in Table 4.

Table 4: Error Correction Model Results

Dependent Variable: PI			
Variable	Coefficient	T-ratio	Prob.
C	0.0212	1.6452	0.12
D(PI (-1))	-0.1232	-0.97234	0.34
D(MFD)	-2.1052	-2.2731**	0.04
D(MFC)	-0.0453	-2.8106***	0.01
D(MFINV)	-0.0114	-1.2546	0.23
D(AGP)	-0.5012	-2.3132**	0.03
D(GEXP)	-0.2407	-1.4045	0.15
ECM(-1)	-0.7812	-2.9431***	0.00
R-squared	0.7543		
Adjusted R-Squared	0.7134		
F-Statistic	15.1202		
Durbin-Watson Stat	1.6832		

*** Statistical significance at the 1% level

** Statistical significance at the 5 % level

* Statistical significance at the 10 % level

Source: Author's computation

The adjusted R-squared value which stands at 0.71, shows that 71 percent of the net systematic changes in poverty index is explained by the combined exogenous variables, including the ECM, suggesting a good fit. With a value of 15.1, the F-statistic is significant at the 1 percent level, validating the hypothesis of a significant linear relationship between poverty index and the explanatory variables. Given a Durbin Watson statistic of 1.68, there is evidence of no serial correlation in the model; an implication that the model is robustly fit for structural and policy analysis. All coefficients of the explanatory variables conform to theoretical projections. The coefficient of past (previous) poverty level, indicated by the first lag of poverty index is negative but not statistically significant at 5% level. This implies that poverty reduction in the current

period does significantly depends on its previous level. Apparently, poverty index in the previous period does not significantly influence current poverty levels in Nigeria, vice-versa.

The coefficient associated with microfinance deposit is negatively signed, in consistency with theoretical projection and passes the significance test at the 5 percent level. Microfinance deposit, by implication, has the capacity to reduce poverty, particularly through increased credit intermediation for productive and entrepreneurial economic ventures, such as small and medium scale enterprises. It, thus, buttresses (validates) the theoretical assertion that the greater the deposit (greater pool of funds), the greater the ability of the micro finance institutions to grant credit facilities to the real sector as exemplified in the financial intermediation theory

The coefficient of microfinance credit is negative in conformity to theoretical expectation and achieves statistical significance at the 1 percent level. This means that increased financial intermediation by the microfinance banks through credit channeling to the real sector will significantly reduce poverty, particularly through enterprise and employment creation, entrepreneurship, investment and productive innovation. The coefficient of agricultural production (output) is negative in line with theoretical expectation and significant at the 5 percent level. Thus, increased agricultural production will significantly reduce poverty in Nigeria. This is particularly true, given the fact that the Nigerian economy is strongly dependent on agriculture, with large portion of the population engaged in it for employment and subsistence, particularly the rural sector where large portion of the poor are found. Invariably, increased agricultural production has the capacity to stimulate larger economies of scale, with positive multiplier effects and spillover on employment generation and consequently poverty reduction. The coefficient of the microfinance investment is negatively signed in line with theoretical expectation but fails the significance test at the conventional 5 percent level. Since its t-ratio is greater than unity, it can be inferred that increased micro finance investment contributes to poverty reduction in Nigeria, although its effect is rather weak. Apparently, greater investment enables microfinance institutions to have large pool of resources, which give them greater ability to grant loans and advances to alleviate poverty in Nigeria.

The empirical results further show that the coefficient of government expenditure is negative in compatibility with the theoretical anticipation, but statistically not significant at the 5 percent level. Since the t-value of its coefficient exceeds unity, we may infer that increased government expenditure contributes to poverty reduction in Nigeria, but its effect is rather weak. This suggests that expenditure pattern in Nigeria has not been pro-poor, perceivably due to poor expenditure-resource prioritization, pronounced corruption and routine diversion of resources meant to reduce poverty. Apparently, its non-significance underscores the critical importance of increased government expenditure on critical economic and poverty- reducing infrastructure, and the need for sound fiscal institutional framework to monitor such expenditure pattern and use of resources to achieve distributive and equity effects, particularly against the backdrop that corruption accentuates poverty. Apart from the diagnostic statistics, the coefficient of the error term is appropriately negative, as theory stipulates and significant at the 5 percent level. Its coefficient indicates that the contemporaneous speed of adjustment to long-run equilibrium poverty reduction after a temporary disequilibrium and perturbation is about 78 percent.

Policy Implications of Findings

Several significant policy implications are deducible from the empirical findings as follows:

- (i) Increased microfinance bank deposit has the capacity to significantly reduce poverty in Nigeria, since it enhances the ability of microfinance institutions to grant more credit to the real sector. Therefore, policies to stimulate microfinance deposits should be implemented.

- (ii) Microfinance credit has a significant reducing effect on poverty in Nigeria. Therefore, it is important that monetary authorities put in place strong, effective and result-oriented policies to enhance the credit intermediation for productive, entrepreneurial and investment purposes, particularly the poor.
- (iii) Increased agricultural production (output) has a significant poverty-reducing capacity. In this regard, aggressive policies to stimulate agricultural production are critical.
- (iv) Increased microfinance investment is negatively related to poverty in Nigeria, albeit a weak impact. Apparently, the greater the investment of microfinance institutions, the higher their capacity to grant loans and advances, and create employment for teeming poor, thereby reducing poverty level in Nigeria. Therefore, the microfinance investment-enhancing policies are needed to steer the financial (credit) intermediation role of microfinance institutions.
- (v) Increased government expenditure, particularly on critical infrastructure such as electricity, transport, communication, etc. is critical to poverty reduction in Nigeria, but the impact of such expenditure is weak on account of poor expenditure prioritisation, corruption and other inhibiting factors. Against this background, a sound fiscal monitoring and control institutional mechanism is required to direct government expenditure to poverty-reducing target areas.

Conclusion and Policy Recommendations

The critical role of microfinance institutions in the substantial reduction of poverty through the credit (financial) intermediation channel, via its vast multiplier effects on investment, entrepreneurship development, employment generation and other productive initiatives is not in doubt. It is on this premise that the study empirically investigated the role of the microfinance activities on poverty reduction in Nigeria. The empirical findings show that microfinance institutions significantly reduce poverty in Nigeria. Increased agricultural development (production) is also found to be a significant poverty reduction variable in Nigeria. The impact of microfinance investment and government expenditure on poverty reduction are found to be weak. Against the backdrop of the foregoing findings, the following policy recommendations are made:

- (i) Increased credit channeling from the microfinance institutions to the real sector of the economy should be encouraged through sectoral policies that will create productive enterprise and significantly reduce poverty in Nigeria.
- (ii) Policies to increase the microfinance deposit and encourage microfinance activities should be implemented by the monetary authorities in order to stimulate their loan or credit giving capacity.
- (iii) Micro finance institutions should put in place policies and strategies to increase their investment in order to increase their credit portfolio size, and consequently enhance their financial intermediation role to the real sector of the economy.
- (iv) Aggressive agricultural output-enhancing policies should be instituted and implemented by government and policy makers, particularly through increased credit to the sector by microfinance institutions, since such will significantly reduce poverty in Nigeria.
- (v) Increase government expenditure on critical infrastructure that will significantly contribute to poverty reduction in Nigeria should be encouraged through greater policy focus and reprioritization.
- (vi) A sound and stable macroeconomic policies and relevant institutional structures to tame corruption and other poverty expenditure diverting acts should be put in place.

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