Analysis of the Impact of Microfinance on Poverty Reduction in Nigeria

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Abstract
The study attempt to evaluate the relationship between microfinance and poverty reduction in Nigeria between 1992 and 2018, using the ARDL estimation technique in the advent of the directive to the financial institutions by the regulatory body to raise their loan to deposit ratio to 60% before 30th of September 2019, larger percent of which must be advanced to small and medium scale enterprises. This necessitated the study as over 80% of the financial institutions fall below this directive at present and may have to give out loans and advances of large amount mandatorily to small and medium scale enterprises. Findings from the study reveal that an inverse and significant relationship exists between microfinance and poverty reduction in Nigeria in the long run and short run. The implication of this finding is that microfinance is an effective tool for poverty alleviation in Nigeria, and aside the positive macroeconomic impact of the directives we expect this policy action to trickle down and alleviate poverty among the people. Findings also show that income redistribution in favour of the poor is also an important means of reducing poverty in Nigeria. Therefore, an effective policy mix of fiscal and monetary policy is necessary to ensure that swift impact on poverty reduction and the achievement of one of the critical socioeconomic objective of the Nigerian Government.

Keywords: Microfinance; Poverty; Autoregressive Distributed Lag Model

Introduction
Poverty alleviation remains a critical developmental objective of many countries, particularly developing countries. The quest to reduce this socio-economic problem has attracted interest from scholars, researchers and policy makers in developing economies which has led to the embrace of the millennium development goals of which poverty alleviation is one. Okpara, (2010) describe poverty both in absolute and relative term as the inability to cater for fundamental necessities such as food, shelter and clothing. This implies that the poor lack access to basic infrastructures such as sanitation and portable water, health and education etc. and as a result are not able to rise above the socially acceptable

economic standard. Moreover, the World Bank describes poverty to be extreme when individuals live below US$1.90 per day, and moderate when individuals live below US$3.10 per day.

Nigeria is listed among world poorest countries (Opkara, 2010); and about two-third her populace lives below the poverty line (Yahaya, & Osemene, 2011). Yahaya, & Osemene, (2011) noted that 70.8% and 92.4% of the Nigerian population live below US$1.25 per day and US$3.10 per day respectively. In order to put an end or alleviate the incessant depth of poverty, various policy actions have been pursued by various governments. The quest to alleviate poverty led to the introduction of microfinance in Nigeria in 2005 (Obadeyi, 2015). This introduction was meant to make credit available to the poor and less privilege with little or no collateral, in order for them to break the poverty cycle (Awojobi, 2011). Policy makers recognise the importance of microfinance in achieving the socio-economic objective of the country and this has been a great tool for some developing nations. According to the central Bank of Nigeria, microfinance is a developmental tool utilized as a means of creating access to financial services at a very cheap price for poor economically active people (Awojobi, 2012). Generally speaking however, microfinance is the provision of a range of financial services which includes payment services, deposit and loans to the poor and low income people who cannot afford the services of conventional financial institutions due to lack of collateral (Samer, Majid, Rizal, Muhamad, & Rashid, 2015).

Since the introduction of microfinance scholars have questioned the effectiveness of the policy in achieving the said poverty reduction. This has led numerous studies to find out how microfinance impacts on poverty incidence in Nigeria. An examination of existing studies on microfinance and poverty alleviation in Nigeria reveals that these existing studies in Nigeria can be classified into two broad categories; Micro and Macro. Numerous studies have examined microfinance and poverty alleviation on the micro scale while using descriptive and statistical tools such as Chi-Square, student's T-test, ANOVA, etc. These studies include Nudamatiya, Giroh, & Shehu, 2010; Yahaya, & Osemene, 2011; Awojobi, 2011; Ebimobowei, Sophia, & Wisdom, 2012; Awojobi, 2012; Kudi, Odugbo, Banta, & Hassan, 2009; among others. On the macro-level there is dearth of literature as only very few could be identified. These include Opkara 2010; Obadeyi, 2015; and Akinlabi, Kehinde, & Jegede, 2011. Interestingly, these studies also used statistical tool in their investigation and at best simple regression estimation. This creates a methodological gap in literature which this study intends to fill by employing the Autoregressive Distributed Lag econometric technique.

Furthermore, the recent announcement by the Central Bank of Nigeria as a directive to the commercial banks to raise their loan to deposit ratio to a minimum of 60% subject to quarterly review before 30th September 2019 has rekindled attention of scholars and policy makers on the effectiveness of this policy action. As a directive large percentage of the loans are to be advanced to medium and small scale enterprises, failure of which will attract penal charge. This policy action is introduced in a bid to increase microfinance, support medium and small scale enterprises and alleviates poverty. It is in view of this policy action that this study seeks to re-examine at the macro-level microfinance and its role on Nigeria's poverty alleviation. Thus, aside filling the gap methodologically this study also adds to the empirical literature on poverty alleviation mechanism or channels in Nigeria at the macro-level. Following this introductory section, the rest of this study is divided into six sections. Section two examines the time path of some important variables, section three reviews existing literature, section four consists of the methodology and model specification, section five contains the empirical estimation and discussion of result while the last section concludes with policy implication.

Time Path of Microfinance and Poverty Incidence in Nigeria

Prior to the advent of microfinance institutions/banks in Nigeria in 2005, the community bank serve in the capacity of the microfinance bank giving credit to household, and SMEs with little or no collateral security. Fig 1.1 presents the trend of microfinance in Nigeria from 1992 to 2018. Between 1992 and 2004 loans and advances of microfinance institutions consolidated and is observed to be flat and trendless. However, with the introduction of microfinance banks in 2005 and the replacement of community banks to microfinance banks in 2006 loans and advances to small and medium scales in various sectors of the economy more than double, and has been on an increasing trend till date recorded higher highs and higher lows. The positive and increasing trend of microfinance is expected to continue with the new policy action of the Central Bank of Nigeria.

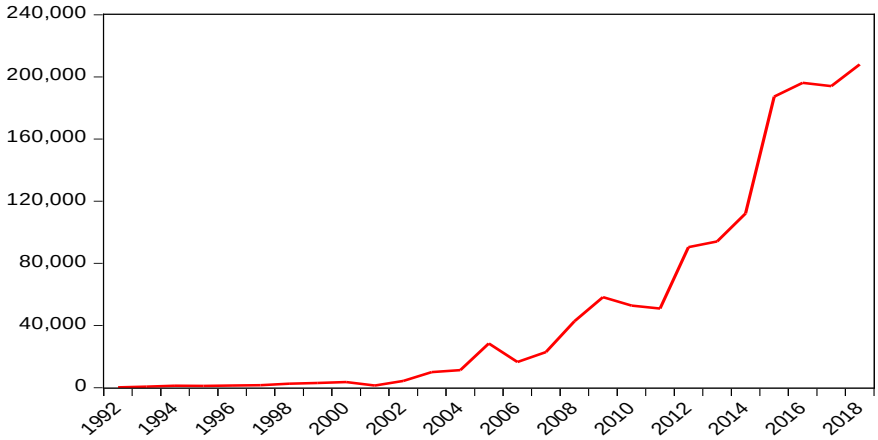

Fig 1 Microfinance (Millions Naira)

Figure 1 shows the trend of poverty incidence measured by poverty gap in Nigeria. The poverty Gap (% of poverty line) which measures the depth of poverty i.e the distance of the poor from the poverty line on average, in the country shows fairly increasing poverty intensity. The poverty Gap stood at 17% as at 1985. Indicating that about 17% of the population lives far below the poverty line. This increased to 27.4% in 1992, an increase of about 10%. As at 1996, the value stood at 31.1% after which it decreased to 21.8% and 21.9% in 2003 and 2009 respectively. The trend of poverty gap remains flat from 2009 to date at 21.9%, a rate percentage of poverty line considers relatively too high.

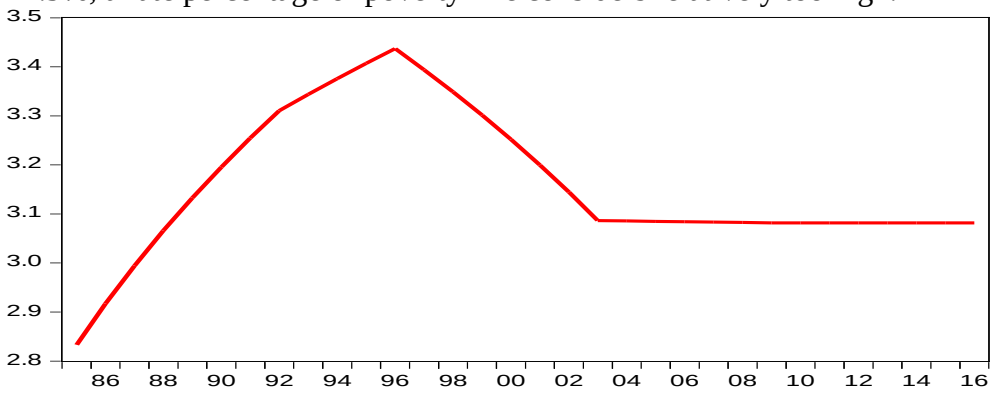

Figure 2: Poverty Gap (% of Poverty Line)

Review of Literature

Theoretical Framework

Classical Grameen Model

This model of microfinance is pioneered by Prof Mohamad Yunus who in the midst of famine in Bangladash in 1974 started the Grameen Bank, with the aim of

providing financial services such as loans and advise to the poor (Bakhtiari, 2006). According to Yunus, (1999) the rules and collateral of the formal institutions are too stringent for the poor which makes access to credit facilities difficult for the poor. As a result, he provided a framework to lend to a group of 5 borrowers with no collateral. He stated further that development should mean the development of the bottom 50% of the population who live below the poverty line. The poor has the potential for growth live every other person, and making provision for credit available to them, the poor can build the future and overcome poverty. This is what is later referred to as Grameen Bank which started as a community/Village private lending institution (Bakhtiari, 2006). This bank grew and rose to be listed amongst world's largest financial organizations. This model is what came to be known as 'microfinance' and microfinance then became a global means through which poverty can be alleviation.

Empirical Review

Various studies in literature have attempted to examine the relationship between microfinance and poverty in Nigeria, and in the quest of achieving that has used various technique of analysis. These studies in literature for Nigeria can be classified into two groups, macro and micro analysis of the impact of microfinance on poverty alleviation. Literature on the aggregate economy (macro) are very few and include Opkara, (2010) who examined microfinance banks and poverty alleviation in Nigeria and employ the method of factor analysis in the bid to identify critical factors that causes poverty in Nigeria. The study also employed regression analysis on a quadratic equation model to examine the impact of microfinance institutions on poverty alleviation. Findings from the study show that microfinance affect poverty in two phases; the first phase shows that poverty increases at a decreasing rate as microcredit increases while the second phase which is estimated to begin from 2001 shows that poverty index decreases drastically as microcredit increases. Using a simple regression technique on the data gotten through survey and oral interview Obadeyi, (2015) on microfinance banking and development of small business in emerging economy, Nigeria observed that microfinance banks have high tendency of boosting the economy. Akinlabi, Kehinde, & Jegede, (2011) examined the impact of microfinance on poverty alleviation in Nigeria by employing Chi-Square, F-test and T-test. Findings reveal that microfinance institutions significantly affects poverty level of those who use them by raising their level of income and changing their economic status.

On the micro level numerous studies have been done to examine microfinance and its role in poverty alleviation. Nudamatiya, Giroh, & Shehu, (2010) analyzed the impact of microfinance on poverty alleviation in Adamawa State using data from 88 beneficiary of micro institution obtained through structured survey questionnaire. The study employed descriptive and inferential statistics such as correlation and t-test, and observed that microfinance impact positively the income of the beneficiaries. In a similar study carried out but using a different case study, Kwara state, Yahaya, & Osemene, (2011) used t-test and ANOVA to examine the effectiveness of microfinance banks in alleviating poverty. The study observed that microfinance banks play important role on the economy by providing financial services to the active poor, employment generation and ensuring the growth of SMEs. Awojobi, (2011) investigated the impact of microfinance as a strategy to alleviate poverty in Nigeria. The study interviewed 40 respondents through questionnaire and observed that microfinance institutions impact positively on respondents' income, employment and household well-being. Ebimobowei, Sophia, & Wisdom, (2012) investigate similar study as Awojobi, (2012) but in Bayelsa State, Nigeria using descriptive analysis, chi-aquare and ANOVA. Findings from the study show that microfinance alone cannot alleviate poverty where necessary socio amenities like good road, steady power supply etc are not available. Kudi, Odugbo, Banta, & Hassan, (2009) examined the impact of UNDP microfinance programme among farmers in selected local government in Kaduna state. Data was collected through structured questionnaire and oral interview.

Using descriptive statistics and independent t-test, findings show that participation in UNDP microfinance programme increases profit and income of farmers. These studies above and numerous others like Olowe, Moradeyo, & Babalola, (2013) who observed an insignificant but positive impact of microfinance on poverty alleviation using Oyo state as case study; Ihugba, Bankong, & Ebomuche, (2014) who observed that the impact of microfinance on poverty alleviation is doubtful etc. all used descriptive and inferential statistical tool. The use of descriptive and statistical tools in this field in literature leaves a gap to be filled methodologically. This study intends to fill this gap by employing an econometric analysis of ARDL estimation technique. Also, there is a dearth of empirical literature assessing the aggregate or macro impact of microfinance on the alleviation of poverty in Nigeria, this study seeks to provide a holistic and a macro empirical examination of the role of microfinance in poverty alleviation in Nigeria.

Research Methodology

Data Description and Sources

The data used for the study are obtained from World Development Indicator (WDI) and the Central Bank of Nigeria Statistical Bulletin ranging from 1992 to 2018. The choice of the scope is due to inadequate data as distribution of finance to SMEs started in 1992. The extracted data are poverty Gap, a measure of the depth of poverty; real gross domestic product per capita which measures economic growth; Gini Index used as a proxy for income distribution; loans and advances of community banks/microfinance banks which is a proxy for microfinance; and inflation rate to capture macroeconomic stability.

Methodology

To carry out the empirical investigation of this study, the Autoregressive Distributed Lag (ARDL) Model empirical framework is employed. This technique is employed because of its advantages over other estimation techniques. In the class of Ordinary Least Square Estimation techniques, ARDL is more flexible as it is suitable for the mixture of stationary and differenced stationary series while also offering series modelling that describes short run dynamics and long run equilibrium (Pesaran *et al.,* 2001). Moreover, as against other techniques ARDL offer a relative new approach for examining long run equilibrium relationship among the series in the model. However, before the application of this technique, preliminary analysis of the properties of the series used in the model will be carried out through descriptive statistics, Augmented Dickey Fuller (ADF) Test and Bounds Test. This is carried out to understand the properties of the series so as to avoid spurious regression.

An ARDL contains lag of the independent and independent variables known as autoregressive lag and distributed lag respectively. For illustration, consider ARDL (1, 1), this implies an autoregressive lag of 1 and a distributed lag of 1. The general ARDL specification is therefore given as ARDL (p, q_1.... q_x)

$$y_t = \alpha + \sum_{i=1}^{p} \gamma_{t-i}\, y_{t-1} + \sum_{j=1}^{z} \sum_{i=0}^{q_j} X_{j,t-i}{}' \beta_{j,i} + \epsilon_t \quad (1)$$

Using ARDL (1, 1), where p = 1, X= 1 and q_j = 0, this gives:

ARDL (1, 1): $$y_t = \alpha + \gamma y_{t-1} + \beta_0 X_t + \beta_1 X_{t-1} + \epsilon_t \quad (2)$$

Model Specification

Following from the empirical framework the functional representation of the ARDL specification of the model is given as:

$$povgp_t = f(mf_t, lrgdpc_t, gini_t, Inf_t) \quad (3)$$

Equation (3) can further be expressed econometrically in ARDL form as:

$$\Delta povgp_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta povgp_{t-i} + \sum_{i=1}^{q1} \alpha_{2i} \Delta mf_{t-i} + \sum_{i=1}^{q2} \alpha_{3i} \Delta Lrgdpc_{t-i}$$
$$+ \sum_{i=1}^{q3} \alpha_{4i} \Delta gini_{t-i} + \sum_{i=1}^{q4} \alpha_{5i} \Delta \inf_{t-i} + \lambda_1 E_{t-1} + \varepsilon_{1t} \qquad (4)$$

$povgp_t$ represents the logarithm of poverty Gap at time t, mf_{t-i} is microfinance at time *t-i*, $Lrgdpc_{t-i}$ is the logarithm of real per capital income at time *t-i*, $gini_{t-i}$ is Gini index at time *t-i*, $\inf_{t-i}$ is inflation rate at time *t-i* , ε_{1t} is the residual at time t, E_{t-1} is the error correction term and $\alpha_0 - \alpha_5$ are the parameters of the model while λ_1 captures the speed of adjustment to equilibrium in the case of disturbance. The a-prior expectation of the independent variables in terms of their parameters to be estimated is:

$\alpha_0 > 0, \alpha_2 < 0, \alpha_3 < 0, \alpha_4 > 0, \alpha_5 > 0 \ \lambda_1 < 0$

Empirical Results and Discussion

Descriptive Statistics

Table 1 present the summary of the properties of the series in consideration. In terms of the Jarque-Bera statistics all the series except the inflation rate are normally distributed since the p-value of the statistics is greater than 0.05. This indicates that the null hypothesis of normal distribution is not rejected. Moreover, with a mean value of 9.33 and standard deviation of 2.06 for microfinance; a mean value 19.34% and standard deviation of 17.92 for inflation rate, table 5.1 shows that both variables indicate the highest volatility given the value of the coefficient of variation while logarithm of gross domestic product shows the least variation from its mean. The mean value of logarithm of real gross domestic product is 5.41, this implies that on the average the economy grows at 5.41% holding other things constant. The table also reveals that income distribution measured by Gini index shows a high inequality in the distribution of income in Nigeria. The examined properties of the series have implication on the stationarity properties of the series, hence the need to check for the other time series properties of the series.

Table 1: Summary of Descriptive Statistics

Variable	No. of Observation	Mean	Standard Deviation	Coefficient of variation (%)	Jarque-Bera statistic
Lpovgp	26	3.183088	0.132190	4.15	3.839190 [0.146666]
mf	26	9.332234	2.056500	22.04	1.410367 [0.494018]
Lgdpc	26	5.408373	0.126342	2.34	3.429212 [0.180035]
Gini	26	44.50385	3.143082	7.06	3.243904 [0.197513]
inf	26	19.34127	17.91916	92.65	20.03736 [0.000045]

Note: The probabilities are presented in blocks [ ]
Source: Author's compilation from Eviews output

Unit Root Test Results

Table 2 shows the ADF stationarity results of the series used in the model within the period of consideration. The test reveals that all the series are stationarity at first difference, that is integrated at order one except the series for microfinance. mf is stationary at levels, that is order zero. By implication, ARDL time-series modelling is more suitable as the series will require first differencing in the presence of mixed order of integration. Although different ADF test equations are employed, the tests with the most significant results are reported. With the stationarity properties of the series in check, there is need to verify the possibility of long run equilibrium relationship among the series.

Table 2: Results of the Augmented Dickey Fuller (ADF) Unit Root Test

Variable	Level	First Difference	Order of integration
$Lpovgp$	-2.308050[a]	-5.179542***[b]	I(1)
mf	-4.586955***[b]	……‡	I(0)
$lgdpc$	-1.214175[a]	-4.232221***[a]	I(1)
$gini$	-2.900257*[a]	-5.036778***[b]	I(1)
inf	-1.979883[a]	-4.901447***[a]	I(1)

*Note: ***, **,* indicates null hypothesis of unit root rejected at 1%, 5% and 10%, respectively; ‡ indicates stationary series at levels which does not require its first difference being reported; b and a denote model with constant and trend, and model with constant only, respectively.*
Source: Author's computation from Eviews output

ARDL Bounds Co-integration Test Result

To examine the presence of co-integration in the series, the study employs the ARDL Bounds co-integration test. Table 3 shows the result of Bounds test for co-integration to check for the presence of long run relationship among the series in the model. Since the F-statistic is greater than the upper bound (I1) critical value at the conventional level of significance, evidence shows that there is co-integration in the model for Nigeria.

Table 3: Result of Bounds Co-integration Test

Model: $lpovgp = f(mf, lgdpc, inf, gini)$		
F-stat	7.663896	
Critical Values		
Significance levels	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's computation from Eviews output

ARDL Regression Results

Table 4 reports the results for the analysed model, vital statistics and the diagnostic test in terms of short run and long run dynamics of the model, homoscedascticity, Heteroscedasticity, and RAMSEY reset tests. Evidence show that there is a negatively significant relationship between microfinance and poverty incidence in the short run and long run at 5% level of significance. The short and long run coefficients are -0.027367 and -0.017769 respectively, which indicate that a 1% increase in microfinance will generate 0.0274% decrease in poverty incidence on the average in the short run and 0.0178% decrease in the poverty incidence on the average in the long run. This conforms to *aprori* expectation as more microfinance is expected to increase income generating capacity of the households, increase their income level and consumption expenditure and subsequently reduce poverty. The implication of this result is that microfinance is an effective source of poverty alleviation and achievement of that millennium development goal in Nigeria.

Furthermore, findings also show that income distribution measure by the Gini index exert a positive and significant impact on poverty incidence in Nigeria in the short run and long run. The impact coefficients are 0.027872 and 0.018097 respectively. These coefficients indicate that 1% increase in income inequality will lead to 0.0279% increase in poverty incidence in the short run and 0.0181%

in the long run on the average. This conforms to a priori expectation and shows that since there is a positive relationship between income distribution and poverty incidence, re-distribution of income in favour of the poor through various mechanisms is a means through which poverty can be alleviated as it present a very good opportunity for Nigeria to reduce poverty incidence. Although economic growth is found to be insignificant in alleviating poverty in Nigeria in the long run and short run, inflation rate shows a significant and positive impact on poverty incidence in the short run and long run at 5% level of significance. The impact coefficients are 0.020% and 0.013% in the short run and long run respectively which indicates that an increase in inflation rate by 1% increases poverty incidence by 0.02% in the short run on the average and 0.013% in the long run on the average. This means that an increase in inflation leads to reduction in the value of money, and implies that more money is needed to maintain the same level of consumption, thereby increasing the poverty incidence.

An examination of the error adjustment term reveals that the coefficient is negative and significant which conforms to a priori expectation and confirms the presence of co-integration in the model. With the error correction term of -0.649291, approximately 64.9% of the disequilibrium is corrected for in the advent of a disturbance. That is, the model converges to long run equilibrium at a speed of 64.9%. Also, the constant which signifies the impact of all other variable that affect poverty incidence not included in the model shows a positive and significant relationship in the short run and long run on the average at 5% level of significance.

Table 4: ARDL Estimates of the Model

Long run Estimates	
Dependent variable	$povgp_t$
mf_t	-0.027367***(0.0000)
$Lgdpc_t$	0.009326(0.8406)
$Gini_t$	0.027872*** (0.0000)
inf_t	0.019958**(0.0466)
C	2.090367***(0.0000)
Short run Estimates	
Dependent variable	$\Delta povgp_t$
ϵ_{t-1}	-0.649291***(0.0000)
Δmf_t	-0.017769*** (0.0002)
$\Delta Lgdpc_t$	0.006055 (0.8375)
$\Delta Gini_t$	0.018097***(0.0000)
Δinf_t	0.012958**(0.0104)
C	1.357255*** (0.0019)
Adjusted R^2	0.994440
F-stat	895.2181 [0.000000]
Ramsey RESET linearity test	0.658546 [0.4271]
Breusch-Godfrey serial correlation LM test	1.379385 [0.2771]
Breusch-Godfrey-Pegan Heteroscedasticity test	1.366536 [0.2785]

*Note: ***, **, * indicates coefficients levels of statistical significance at 1%, 5% and 10% respectively; the p-values are reported in block brackets and parentheses. RESET means Regression Error Specification Test*
Source: Author's computation from Eviews output

An examination of the vital statistics shows that 99.44% of the variation in the dependent variable (poverty incidence) is accounted for by Gini index, inflation rate, economic growth, and microfinance put together, while 1.56% is accounted for by all other variables not included in the model. Moreover, since the probabilities associated with each of Ramsey RESET linearity test, serial correlation test and heteroscedasticity test are greater than 0.05, it can be concluded that the estimated ARDL model does not suffer from wrong functional form, serial correlation and non-constant residual variance.

Conclusion and Policy Implication

The study attempt to evaluate the relationship between microfinance and poverty reduction in Nigeria between 1992 and 2018, using the ARDL estimation technique in the advent of the directive to the financial institutions by the regulatory body to raise their loan to deposit ratio to 60% before 30th of September 2019, larger percent of which must be advanced to small and medium scale enterprises. This necessitated the study as over 80% of the financial institutions fall below this directive at present and may have to give out loans and advances of large amount mandatorily to small and medium scale enterprises. Findings from the study reveal that an inverse and significant relationship exists between microfinance and poverty reduction in Nigeria in the long run and short run. The implication of this finding is that microfinance is an effective tool for poverty alleviation in Nigeria, and aside the positive macroeconomic impact of the directives we expect this policy action to trickle down and alleviate poverty among the people. Findings also show that income redistribution in favour of the poor is also an important means of reducing poverty in Nigeria. Therefore, an effective policy mix of fiscal and monetary policy is necessary to ensure that swift impact on poverty reduction and the achievement of one of the critical socioeconomic objective of the Nigerian Government.

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