DETERMINANTS OF LOANS AND ADVANCES EXTENDED BY MICROFINANCE BANKS IN NIGERIA

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Abstract: *In consideration of the roles of microfinance banks (MFBs) in poverty reduction, employment generation and overall development of an economy, particularly a less developed economy, the paper employs the methodology of ARDL-based Bounds test approach to co-integration and error correction analysis to investigate the determinants of loans and advances extended by microfinance banks in Nigeria using data spanning the period from 1992 to 2013. The empirical evidence indicates that the major determinants of the amount of loans and advances extended by MFBs are deposits, shareholders' fund, liquidity ratio and inflation. Customers' deposits positively affect MFBs' loans and advances in the short-run and long-run, though the long run effect is not significant. Shareholders' fund also positively affects MFBs' loans and advances in the short-run and long-run. Inflation and liquidity ratio negatively affect the amount of loans and advances extended by the MFBs. Measures recommended by the paper to boost the supply of loans and advances by the MFBs to enhance their contributions to economic growth and development of Nigeria include mobilization of more deposits, expansion of shareholders' base and fund and, credit risk management by the MFBs, setting the liquidity ratio by the Central Bank at levels that will not over-contract the ability of MFBs to extend loans and advances to microenterprises and, control of inflation by the relevant authorities.*

Keywords: Microfinance Bank, employment, financial markets

JEL Classification codes: G21, J21, D53

1. Introduction

Microfinance institutions, particularly, microfinance banks (MFBs) play crucial role in the development of the less developed economies. They provide loans and advances and other financial services within the ambit of their operations to their clients which include low income earners, low income households, the un-banked and un-served people such as women, physically challenged, youth, micro-entrepreneurs, informal sector operators, subsistence farmers in rural and urban areas thus actively participating in reduction of unemployment and job creation which ultimately engender improvement in living standards, reduction in poverty rates and enhancement of economic growth (Central Bank of Nigeria, 2013). The main objective of microfinance institutions is to expand access to credit by micro entrepreneurs who may not have access to credit facilities provided by the larger commercial and industrial banks. Thus they exist to provide financial services to the "grassroot" segment of the economy. These views were supported by Morduch (1999), who noted that provision of financial services to low income households can help in poverty alleviation and fundamental transformation of social and economic structures. In all, it could be said that MFBs play very

crucial role in the promotion of financial inclusion which is an important ingredient for economic growth and development (Umar, 2011).

Modern microfinance banking dates back to the mid-1970s in rural Bangladesh when Dr Muhammad Yunus, Professor of Economics at the Chittagong University established the Grameen Bank Project (literally translated as "Village Bank") in the midst of a famine, to assist the rural poor (PlaNet Finance Group, 2015). Microfinance banks came on the scene of Nigeria's financial system following the formulation of the National Microfinance Policy in the month of December 2005 as part of the reforms initiated by the former governor of the Central Bank of Nigeria (CBN). The policy was meant to deepen access of micro entrepreneur to financial services to finance their businesses and contribute to accelerating the growth of the economy. It was formulated as a result of the observed weaknesses of the erstwhile community banks caused by poor management, weak capital base, weak internal control, absence of deposit insurance schemes, etc. Thus in December 2006, all existing community banks were directed to transform to Microfinance banks.

In a circular dated August 11, 2011, the Central Bank of Nigeria established new minimum paid-up capital requirements for the three categories of MFBs in the country. The minimum paid-up capital for Unit Microfinance Banks which are only authorised to operate in one location was set at N20 Million; that of State Microfinance Banks which are authorized to operate within a State or the Federal Capital Territory (FCT) and open branches/cash centres therein, was set at N100 million; while the minimum paid-up capital for National MFBs which are authorized to operate in more than one state of the country and the FCT, was set at N2 billion. This was to ensure the soundness of the microfinance banking subsector to expand the capacities of the MFBs to lend to small and micro-entrepreneurs, thus making them contribute meaningfully to reduction of unemployment, eradication of poverty and acceleration of economic growth.

However, though the amount of loans and advances extended by Microfinance Banks in Nigeria have trended upwards, rising from N16,450.2 million in 2006 when the then community banks converted to MFBs following the directive issued by the CBN the previous year (2005), to N94,055.6 million in 2013 (CBN, 2013), yet the number of poor people (particularly the so-called "poorest of the poor" who are supposed to be the major beneficiaries of financial services offered by the MFBs) who are unable to access the loan facilities has been regrettably high. This suggests *inter alia* that the MFBs are constrained in their ability to lend, and that a major objective of government's policy on Microfinance Banking in the country has not been fully achieved.

Acha (2012) identified several opportunities for the microfinance sector to explore. These include the growing entrepreneurial awareness, large unbanked rural area and high population of poor people. Exploring theses opportunities invariably requires adequate channeling of funds (loans and advances) to meet the financial needs of micro-entrepreneurs. The ability of the MFBs to extend loans and advances is affected by multiplicity of factors ranging from the macroeconomic factors such as inflation, exchange rate, government expenditure, etc., to the bank-specific factors such as shareholders fund, deposit size, liquidity ratio, number of MFBs, etc. Known previous studies tended to investigate the determinants of MFBs loan repayment/loan payment defaults, or the contributions of MFBs to poverty reduction, economic growth and development or to discuss the problems and prospects of microfinance banking in Nigeria (Oke and Agbonlahor, 2007; Rotich, Lagat and Kogel, 2015). As far as we know, (to the best of our knowledge), apart from the study by Awoyemi and Jabar (2014) which examined the effect of commercial banks prime lending rate on the performance of microfinance banks in Nigeria in the 1992-2011 sample period using correlation analysis, wherein it was found that high prime lending rate of commercial banks is associated with increase in the total assets of MFBs, and decrease in MFB loans and

advances, and that of Rai and Rai (2012) which investigated the factors affecting financial sustainability in India and Bangladesh and suggested that capital-asset ratio, operating expenses/loan portfolio and portfolio at risk are the major factors affecting the sustainability of microfinance institutions, no study has yet investigated comprehensively, the determinants of loans and advances extended by the MFBs in Nigeria and indeed in Africa. The current study intends to undertake this task. The research question addressed by the paper is: What are the determinants of the amount of loans and advances extended by the MFBs in Nigeria? The objective of this paper therefore is to investigate the determinants of the amount of loans and advances extended by microfinance banks' in Nigeria with a view to recommending measures to enhance the supply.

2. Methodology
2.1.The Model and Estimation Techniques

Following the work of Aigheyisi and Oaikhenan (2014) which specified a model to investigate the determinants of commercial banks' loans and advances to the private sector in Nigeria, we specify our model to investigate the determinants of microfinance banks loans and advances in Nigeria in its functional form as:

$$MFBLA = f\ (MFBDEP, MFBSHF, MFBLR, INF) \qquad (1)$$

Where MFBLA   = Microfinance banks loans and advances
           MFBDEP = Microfinance banks deposits
           MFBSHF = MFBs' Shareholders funds
           MFBLR   = Liquidity Ratio
           INF   = Inflation, measured as annual percentage change in consumer price index

Equation 1 hypothesises that the amount of loans and advances extended by MFBs in Nigeria is affected by the size of customers' deposits, shareholders' funds, the liquidity ratio and inflation.

The method of cointegration and error correction mechanism (ECM) shall be employed for the investigations. The choice of this methodology is informed by the need to investigate the dynamic relationships between the exogenous variables and microfinance banks' loans and advances and to investigate the long-run effects of the selected explanatory variables on the amount of loans and advances extended by the MFBs in Nigeria. The methodology involves three steps namely the stationarity test (also referred to as the unit root test), the cointegration test (to determine the existence or otherwise of long run cointegrating relationships among the variables); and if the variables are found to be cointegrated, the short run dynamic relationship between the dependent variable and the explanatory variables shall be represented with an error correction model. Thus estimation of the error correction and long-run models is the last step in the methodology.

The Augmented Dickey Fuller (ADF) test is adopted to test for unit root. It entails estimating the regression equation (Gujarati, 2004):
$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m}(\alpha_i \Delta Y_{t-i}) + \varepsilon_t. \qquad (2)$$
(Y represents each variable series, t represents the time or trend variable and ε_t is a white noise error term. $\Delta Y_t = Y_t - Y_{t-1}$, $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$, etc), and using the critical tau (τ) value to test the null hypothesis that $\delta = 0$ (i.e. there is unit root in the series or, the series is non stationary), against the alternative hypothesis that $\delta < 0$ (i.e. absence of unit root in the

series or the series is stationary). Rejecting the null hypothesis at a chosen level of significance (1%, 5% or 10%), implies that the series is stationary.

On the presumption that the variables may be of mixed order of integration, the ARDL-Bounds test approach to cointegration advanced by Pesaran and Smith (1999) and Pesaran, Shin and Smith (2001) which is the appropriate method to test for level relationship between variables that are mixed order of integration shall be employed to test for cointegration (long-run) relationship between the dependent variable and the explanatory variables.

The Bounds test approach to cointegration involves specifying a conditional VECM of interest in the form:

$$\Delta LMFBLA_t = a_0 + \lambda_1 LMFBLA_{t-1} + \lambda_2 LMFBDEP_{t-1} + \lambda_3 LMFBSHF_{t-1} + \lambda_4 LMFBLR_{t-1} + \lambda_5 LINF_{t-1} +$$

$$\sum_{j=0}^{n1}\left(\phi_j \Delta LMFBDEP_{t-j}\right) + \sum_{i=0}^{m1}(\theta_i \Delta LMFBSHF_{t-i}) + \sum_{x=0}^{P1}(Ч_x \Delta LMFBLR_{t-x}) +$$

$$\sum_{r=0}^{q1}(\partial_r \Delta LINF_{t-r}) + \varphi G + e$$

(2)

Where G is the error correction term, and **e** is white noise error term. The model is estimated with the OLS estimation technique to test for the joint significance of the coefficients of the lagged levels of variables using the F-statistic test. Thus the null hypothesis: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6$ is tested against the alternative hypothesis: $\lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6$. The computed F-statistic is compared with two critical values (lower bound and upper bound critical values) at a chosen level of statistical significance. If the F-statistic is greater than the upper bound critical value, it can be inferred that level relationship exists between the dependent variable and the explanatory variables; this is to say they are cointegrated. F-statistic less than the lower bound critical value indicates no cointegration, while F-statistic between the lower and the upper bounds' critical values is inconclusive.

The error correction model is specified as:

$$\Delta LMFBLA_t = a_0 + a_1 \Delta LMFBLA_{t-1} + \sum_{i=0}^{m}\left(\beta_i \Delta LMFBDEP_{t-i}\right) + \sum_{j=0}^{n}\left(\chi_j \Delta LMFBSHF_{t-j}\right) +$$

$$\sum_{k=0}^{P}\left(\partial_k \Delta LMFBLR_{t-k}\right) + \sum_{u=0}^{b}\left(\dagger_u \Delta LINF_{t-u}\right) + \Omega ECT_{t-1} + \xi_t \quad (3)$$

The variables are as previously defined. L represents natural logarithm. The *a priori* expectations are $(\beta_i, \chi_j) > 0, (\partial_k, \dagger_u) < 0$. *m,n,p,b* are optimal number of lags of the respective variables. The coefficient of ECT (Ω) is expected to be negatively signed, and statistically significant for it to play the role of error correction in the model. The negative sign is also an indication that the variables are cointegrated. The absolute value of the coefficient of ECT measures the speed of adjustment to equilibrium in the event of short-run deviations therefrom.

The associated long-run equation is specified as:

$$LMFBLA_t = \beta_0 + \beta_1 LMFBDEP_t + \beta_2 LMFBSHF_t + \beta_3 LMFBLR_t + \beta_4 LINF_t + \mu_t$$

The *a priori* expectations are $(\beta_1, \beta_2) > 0; (\beta_3, \beta_4) < 0$.

Annual time series data covering the period from 1992 to 2013 were utilised for the analysis. The data were sourced from the Central Bank of Nigeria Statistical Bulletin (2013). The choice of the scope (1992-2013) is informed by the fact that available data on community/microfinance banks in Nigeria begins from 1992 as this is actually the year

community banking which later metamorphose into microfinance banking was formally introduced into Nigeria's financial system by Community Banks Decree No. 46 of 1992.

2.2.Discussion of Expected Results (Theoretical Justification of *a priori* Expectations)

Deposit Size and MFB Loans and Advances

Customers' deposits with banking financial institutions are their largest source of funds (Simpson, 2015) and the major determinant of the size of their loans and advances. Deposits represent a liability to the banks, and with this liability, an asset is created through lending, and for the MFBs part of the profits generated by micro-entrepreneurs from the ventures for which the loans were acquired are usually re-deposited with them. Thus it is often said that *lending creates its own deposit*. All things being equal, the larger the amount of deposits a banking financial institution (including MFBs) has, the larger is its capacity to lend. Thus, the amount of loans and advances extended by the MFBs is presumed to be directly proportional to the size of their deposit liabilities.

Shareholders' Funds and MFBS' Loans and Advances

The shareholders fund is the investment made by the owners of the MFB in it. In other words, it is an indicator of the shareholders' ownership interest or stake in the business. It is an important component of banks' capital, and helps to prevent banks from going insolvent (not being able to pay their debts). Other things being equal, financial institutions with large shareholders' fund are seen as strong and safe banks with large capacity to finance huge projects, ensure safety of customers' deposits (where there are deposit insurance schemes) and resist negative external shocks. The guaranteed safety enhances their attractiveness to depositors, and this leads to increase in their deposits thereby expanding their capacity to lend, *ceteris paribu*s. Thus shareholders funds are predicted to be positively related to the size of MFBs loans and advances.

Liquidity Ratio and MFB Loans and Advances

The central bank uses the liquidity ratio as an instrument of monetary policy to influence money supply and control inflation by regulating the ability of banking financial institutions to lend. The liquidity ratio is a percentage of banks' liquid assets that they are expected to hold as reserves or maintain (in some liquid form particularly gold and approved government securities) in order to maintain their liquidity and solvency, before lending to the public. The ratio is raised if the central bank wishes to contract banks' capacities to lend, and it is lowered if it wishes to expand their lending capacities. Thus an inverse relationship is hypothesized to exist between liquidity ratio and MFB loans and advances.

Inflation and MFBs' Loans and Advances

Increase in inflation is associated with decrease in MFBs loans and advances. This results from the fact that inflation engenders a rise in transaction demand for money as a result of the decline in the value of money it causes. This is to say inflation reduces the value of money, and this in turn, other things being equal, triggers increased withdrawals by depositors from their deposits at the banks to facilitate purchases. Furthermore, inflation and inflation expectation reduce the desire to hold money in form of cash or bank deposit and triggers the desire to increase investment in financial assets (such as bonds, stock, treasury bills, gold etc) to hedge against inflation which could erode the value (or purchasing power) of money. The decrease in customers deposit in the financial institutions occasioned by inflation-induced withdrawals impels the institutions to charge higher interest on their loans

and advances. Thus increase in inflation causes a rise in the nominal interest charged by banks on loans. This is explained by the *fisher's equation.* The increase in interest rate resulting from the decline in the deposit base of the banks engendered by inflation culminates in decrease in the amount of loans and advances demanded by borrowers and extended by the MFBs. Thus inflation is hypothesized to be inversely related to MFB loans and advances.

3. Empirical Results and Discussions
3.1.Unit Root and Cointegration Test Results
We begin the analysis with the unit root test to determine whether or not the variables are stationary. The test for stationarity is conducted with the Augmented Dickey Fuller test. The results are presented in Table 1.

Table 1. ADF Tests for Unit Root in Variables (Regressions include an intercept and a linear trend).

Variables	Order of Integration	ADF Test Statistics	Critical ADF Value (5%)
LMFBLA	I(0)	-4.3668	-3.6450
LMFBDEP	I(0)	-4.3632	-3.6450
LMFBSHF	I(1)	-5.8798	-3.6584
LMFBLR	I(1)	-4.2649	-3.6584
LINF	I(1)	-6..8525	-3.6584

The unit root test results show that the variables are of mixed order of integration. While the logs of MFB loan and advances and deposit variables are stationary at levels (that is integrated of order zero), logs of MFB shareholders' fund, liquidity ratio and inflation variables are stationary at their first differences (that is they are integrated of order 1). The mixed order of integration of the variables justifies the suitability and choice of the ARDL-based Bounds test for cointegration. The result of the cointegration test is presented in Table 2.

Table 2. ARDL Bounds Test for Cointegration

ARÐL Bounds Test
Date: 12/03/15 Time: 13:22
Sample: 2 22
Included observations: 21
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	3.090635	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

The ARDL Bounds test shows that the computed F-statistics is (narrowly) greater than the upper bound at the 10% level of significance. Thus the null hypothesis of no long-run relationship is rejected at the 10% significance level. This implies that equilibrium (long-run) relationship exists between MFB loans and advances and the explanatory variables. According to the Granger Representation Theorem, cointegration of variables suggests that

the short-run relationship between them can be represented with an error correction model. The estimated error correction model as well as the long-run parameters is shown in Table 3.

3.2.Estimated Error Correction and Long-run Models

The results of estimation of the error correction and long-run models are presented in Table 3.

Table 3. Estimated Error Correction and Long-run Models

ARDL Cointegrating And Long Run Form
Dependent Variable: LOG(MFBLA)
Selected Model: ARDL(1, 1, 1, 0, 1)
Date: 12/03/15   Time: 13:20
Sample: 1 22
Included observations: 21

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(MFBDEP)	0.605686	0.217397	2.786089	0.0165
DLOG(MFBSHF)	0.451936	0.189615	2.383447	0.0345
DLOG(MFBLR)	-0.101653	0.170920	-0.594740	0.5631
D(INF)	-0.004883	0.002686	-1.818136	0.0941
CointEq(-1)	-0.928314	0.256100	-3.624815	0.0035

Cointeq = LOG(MFBLA) - (0.2751*LOG(MFBDEP) + 0.7835*LOG(MFBSHF)
 -0.4779*LOG(MFBLR) -0.0715*LOG(INF) + 1.6960)

| Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(MFBDEP)	0.275078	0.359141	0.765932	0.4585
LOG(MFBSHF)	0.783523	0.319167	2.454897	0.0303
LOG(MFBLR)	-0.477917	0.156807	-3.047803	0.0101
LOG(INF)	-0.071547	0.049148	-1.455750	0.1711
C	1.695970	0.906738	1.870409	0.0860

The results show that the signs on all the variables (in both ECM and long-run models) conform to *a priori* expectations. Microfinance banks' deposits positively influence the amount of loans and advances extended. The impact as indicated by the t-ratio and associated probability is significant even at the 2% level. The coefficient indicates that a 10% increase in the size of MFBs deposit is associated with 6.1% rise in the amount of loans and advances extended by the banks. The size of MFBs shareholders' fund also positively influence the amount of loans and advances extended by the MFBs. The influence as indicated by the t-ratio and associated probability is significant at the 5% level. The coefficient indicates that a 10% rise in the size of shareholders fund is associated with 4.5% increase in the amount of loans and advances extended by the MFBs. Liquidity ratio and inflation rate are, as expected, inversely related to MFBs loans and advances in the short-run, though the coefficient of liquidity ratio is not statistically significant as indicated by t-ratio. This suggests that the short-run effect of increase in liquidity ratio on the amount of loans and advances the MFBs can extend is not significant. Inflation adversely affects the amount of loans and advances extended by the MFBs. The effect is significant at the 10% level. The error correction coefficient [cointeq(-1)] has the correct (negative) sign, and is highly statistically significant

even at the 1% level. This is further evidence that the dependent variable and explanatory variables are indeed cointegrated. The absolute value of the coefficient indicates a very speed of adjustment to equilibrium in the event of short run deviation there from. Specifically, 96% of disequilibrium is offset by short-run adjustment annually to maintain the equilibrium (long-run) position.

The signs on the coefficients of the explanatory variables in the long-run model conform to *a priori* expectations. However, deposit variable is not statistically significant at any of the conventional levels. Shareholders' fund retains its statistical significance in the long-run model as the t-ratio indicates that the variable is significant at the 5% level. The coefficient indicates that 10% sustained increase in MFBs shareholders' fund is associated with 7.8% rise in the amount of loans and advances extended by the MFBs. Liquidity ratio is inversely related to MFB loans and advances in the long-run. The relationship is significant at the 1% level. A 10% permanent or sustained increase in the liquidity ratio is associated with 4.7% decrease in MFB loans and advances. The long-run effect of inflation on the amount of loans and advances extended by MFBs is not statistically significant.

The test of the structural stability of the model involving the plots of cumulative sum of recursive residuals and cumulative sum of squares recursive residual (Figure 1) indicates that the model is structurally stable. Thus the model can be relied upon for policy.

Figure 1. Test of Structural Stability
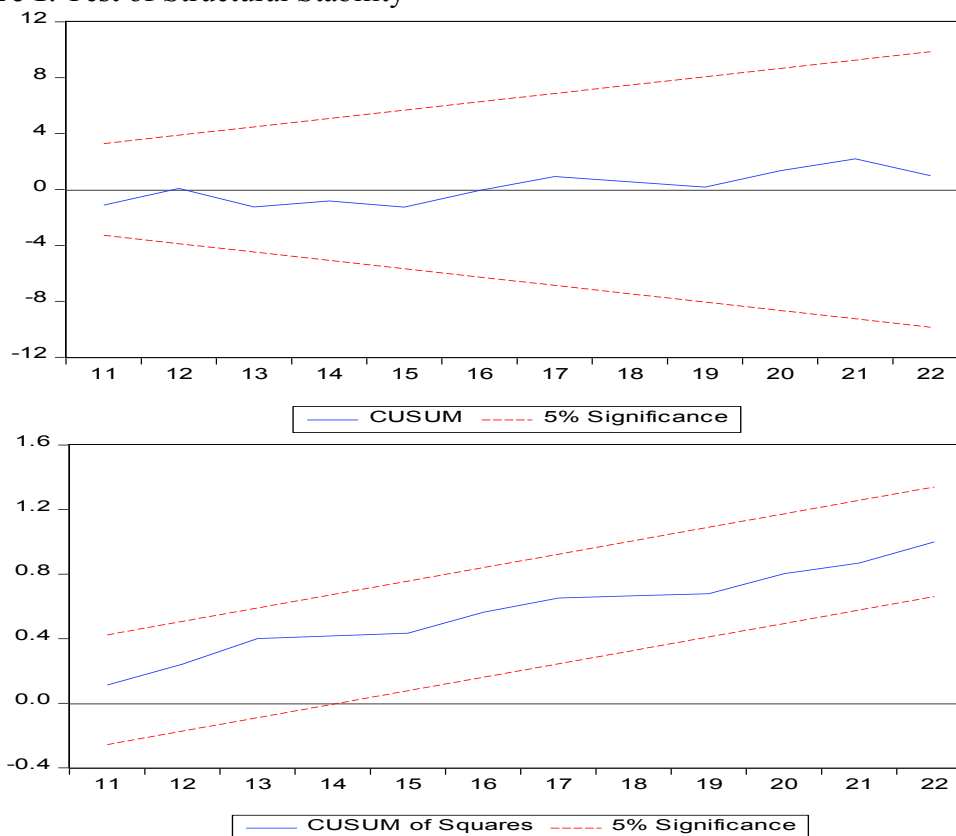
4. **Conclusion and Recommendations**

In consideration of the role of microfinance institutions in the promotion of financial inclusion, employment creation and eradication of poverty in the quest for economic growth and development in less developed countries, the paper examined the factors affecting the supply of loans and advance by microfinance banks in Nigeria in the period 1992 to 2013. It

found that the major determinants of the amount of loans and advances extended by MFBs are deposit size, shareholders' fund, liquidity ratio and inflation. Deposits positively affected MFBs loans and advances in the long and short run, though the long run effect was not statistically significant. The short-run and long-run effects of shareholders' funds on the amount of loans and advances extended by the MFBs were positive and significant. Liquidity ratio negatively affected MFBs' loans and advances in the short-run and long-run, however the short run effect was not statistically significant, but the long-run effect was significant. The short-run effect of inflation on the amount of loans and advances extended by MFBs loans and advances was negative and significant, while the long-run effect was not statistically significant.

In light of the empirical evidence, we proffer the following recommendations to enhance the supply of loans and advances by the MFBs.

I.   Considering that customers' deposits were observed to be positively and significantly related to loans and advances extended by the MFBs, there is need for the MFBs to channel more effort towards deposit mobilisation in order to expand their deposit base. This could be achieved by development of new, innovative and attractive financial products or services as well as engagement of well trained and motivated sales force (marketers). This also entails establishment of MFBs branches in areas where they are few or where they do not yet exist, particularly the core rural areas.

II. The importance of the shareholders' fund to the development of MFBs is reflected in its positive short-run and long-run effects on amount of loans and advances extended by the MFBs. This suggests the need for MFBs to take steps towards expanding their shareholder's funds. MFB may also consider the option of getting listed on the stock exchange (for those MFBs which have met the listing requirements of the Securities and exchange Commission, but are not yet listed), and then offering their shares to the public for subscription. MFBs not listed on the stock exchange which have not met the requirements for listing can also expand their shareholders' base by offering their shares through private placement to high profile and institutional investors taking care not to violate any of the extant rules and regulations. However, in doing this, the MFBs must take steps to safeguard the investment of its shareholders by putting measures in place to minimise or reduce the chances of loans turning 'bad' as this may deplete the shareholders' fund, leading to loss of shareholders' value. The regulatory authority should also consider setting up shareholders protection fund as had been done in Europe

III. There is need for the Central Bank to set the liquidity ratio at levels that will not over-contract the ability of MFBs to extend loans and advances to microenterprises which rely heavily on loans from the MFBs.

IV. Considering that inflation is negatively related to the amount of loans and advances extended by the MFBs, there is need for the government to make use of appropriate policies (monetary policy, fiscal policy, etc.) to control inflation so as to minimize or reduce its effect.

V.   Inasmuch as extending credit to micro-entrepreneurs is very much desirable, the MFBs should set up appropriate credit risk management mechanism to minimize risks such as loan repayment defaults associated with lending to "high risk" borrowers.

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