IMPACT OF CAPITAL STRUCTURES OF MICROFINANCE BANK ON FINANCIAL AND SOCIAL PERFORMANCE IN NIGERIA (2004-2018): AN AUTOREGRESSIVE DISTRIBUTED LAG (ARDL) MODEL

***MEVAYEKUKU, E. David, *ECHEBIRI, N. Raphael and **MADUEKWE, M. Innocent,**
**Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Nigeria, **Department of Agricultural Economics, University of Abuja, Abuja, Nigeria*

*****Corresponding autho**: davemevaye@gmail.com*

Abstract
The study evaluated the impact of capital structure on financial and social performance of microfinance banks (MFBs) in Nigeria. The objectives were to investigate effect of capital structure on financial performance of MFBs; and appraise the impact of capital structure on social outreach of MFBs in Nigeria. The study used panel data for the period of 2004-2018 sampled 19 MFBs out of 69 MFBs and sourced from MIX-Market. The data were analyzed with autoregressive distributed lag (ARDL) framework and the properties of panel data were checked with normality tests and panel unit root tests. On effect of capital structure on financial performance, the coefficients of debt-to-equity ratio and total assets are positive and significant ($p<0.01$) in explaining financial performance of MFBs. On the other hand, coefficient of debt–to-equity ratio is negative and significant ($p<0.004$) in explaining social outreach of MFBs in Nigeria. Moreover, the error correction term coefficient is signified that short-run disturbance is adjusted in the long-run and the results suggest the existence of a rebound effect. The errors or disturbances were corrected at the different speeds per annum in long-run. The study recommends policy that will promote financial sustainability because it influences financial inclusion in the long run should be promoted by policy makers.

Keywords: impact, capital structure, microfinance banks, financial performance, social performance, social outreach, financial inclusion, ARDL model.

INTRODUCTION

Microfinance institutions have contributed to financial inclusion through creating access to financial services and expand the usages for the poor, who are mostly un-served by the traditional financial institutions. Zeller and Meyer (2002) opined that microfinance performs triangular functions of social and financial intermediations namely, outreach to the poor, poverty reduction and financial sustainability. Performing these functions have significantly contributed to the financial system stability and financial inclusion in many developing economies (Reed 2011; and Ahmed *et al.,* 2018). With recent commercialization through restructuring of microfinance institutions such as the transformation of community banks in Nigeria into microfinance banks through tier system will definitely have impact on the capital structure of these institutions. According to Bayar and Ikhide (2016), commercialization of microfinance institutions created new stakeholders therefore a new financing structure was introduced into the industry.

Capital structure is the mix of debt and equity which firm deems as appropriate to enhance its operations (Islam and Nasreen 2018). Pandy (2010) defines capital structure as the various means of financing a firm. That is, the proportionate relationship between debt and

equity. And explains further that capital structure is one of the significant managerial financial decisions because of it influences the shareholders' return and risk as the market value of the share may be affected by the capital structure decisions. Adesina *et al.,* (2015) argue that when making decisions in respect of capital structure of microfinance institutions, managers are expected to seek answers to the following questions among others: Does commercialization of microfinance sub-sector enhance financial sustainability and attain poverty outreach simultaneously in Nigeria? How has the motives of institutional logic or welfare logic been enhanced with capital structure?

Trying to provide answers to above questions were Modigiliani and Miller (1958) theory of capital structure through their seminal work of 1958. Several theoretical and empirical works of Jensen and Meckling (1976); Brander and Lewis (1976); Harris and Raviv (1990) have been carried out in the pioneering efforts of Modigiliani and Miller studies of 1958. The directions of these researches were to determine the appropriate and optimal level of debt and equity combination based on trade-off between cost and benefits of debt. Another issue is the agency cost that arises as a result of corporate governance because of the separation between ownership and management control results in agency problems. In such circumstance, managers are likely to pursue objective function which may be at variance with the shareholders objectives. This creates agency cost because of divergence between ownership and control (Islam and Nasreen 2018). According to duo, capital structure is one of the corporate finance techniques considered to keep adequate control.

Microfinance bank operation in Nigeria is significant to the country's socioeconomic development as it plays crucial path to financial inclusion in the country. Despite this recognized role, the sub-sector has been marred with numerous challenges threatening their growth and expansion. CBN regulation and policy made all the microfinance banks (MFBs) in the country deposit taking, an operating system in line with that of deposit money banks. In addition, MFBs equally lend loan to their customers implying that they rely heavily on debt and retain earnings (Waweru and Wanyoike 2016). This is a huge challenge due to inadequate savings capacity of their clients; poor retain earnings and exorbitant interest rates charged by conventional deposit money banks whining lending to MFBs. Therefore, when MFBs lack sufficient funds to advance to clients in the forms of loans; the implication is the profit forgone consequently lead to losses and ultimate collapse of the MFBs. Even if the MFBs have access to funds either from money deposit taking banks or deposits from their clients, the majority of the clients do not have the collateral systems to guarantee the loans resulting on the inability of clients to repay the loans, there are no collateral to liquidate to reclaim the assets these often lead to poor financial performance and social outreach.

There have been several studies conducted in various countries on the effect of capital structure of microfinance institutions on financial performance and social outreach; however, there is hardly one that focuses on the performance of microfinance banks in Nigeria. After changing from social-oriented-community banks to form of commercial-oriented microfinance institutions occasioned in the forms of restructuring through tier-system and recapitalization of the microfinance banks to perform their corporate function, there have not been any serious study on how the emerging capital structure has influenced and impacted their performances. This study is an attempt to fill this gap by investigating the effect of capital structure of microfinance banks on financial performance and social outreach in Nigeria between 2004 and 2018. While the specific objectives to: i) investigate effect of capital structure on financial performance of MFBs; and ii) evaluate the impact of capital structure on social outreach of MFBs in Nigeria.

The rest of the paper is structured as follows: section 2 presents literature reviews on the

effects of capital structure on microfinance institutions performance. Section 3 and 4 describe research methods and empirical findings respectively. Section 5 concludes the paper by highlighting the implications of the study on financial inclusion policy in Nigeria.

Theoretical Framework and Literature Review

For microfinance institutions to become financial sustainable, the capital structure composition is important. The financial structures or capital structure of microfinance institutions has impacts on how they conduct their business, earnings of the investors and shareholders returns and risk. Capital structure refers to the firm's financial framework. It is regarded as the various means of financing a firm. It is relative amount of debt and equity employed to finance firm operations. The microfinance institutions capital structure includes two major parts: liabilities and equity. Total liabilities or total debts typically include voluntary deposits, compulsory savings, debts and other liabilities on the one hand. On the other hand, total equity, generally refers to the total money or funds the owners have invested since microfinance institutions need to provide services to more financially-excluded clients as well as the costs of capital.

Annan (2018) asserts that at its most basic form, the microfinance industry has three principal actors: i) borrowers who apply for and receive loans from microfinance institutions and benefit from the services they provide; ii) the microfinance institutions, who provide the financial services; and iii) funders, who provide capital and act as funding sources for the microfinance institutions. And the sources of capital are classified into two main financing instruments: liabilities and equity financing (Mullineux and Murinde 2001). The numerous sources of capital fall into the two categories. This may include funds from institutional investments, donors, commercial banks, individuals, foundations, NGOs, governments, charity organizations and as well as depositors. These groups including ownership structures have differential impacts on the various dimensions on the microfinance institution performance (Khachatryan *el at.* 2013) and equally ownership structures impact the performance too. Despite these numerous sources, many microfinance institutions failed due to capital (funding) constraints that negatively impact their operations; inability to service their debts as well as outright incapability to recover their debts or default (Annan, 2018). The above leads to: i) inadequate capital; ii) unsuitable funding mixes; and iii) unsustainable funding flows in microfinance institutions in Nigeria. Therefore, access to funding is a fundamental deciding factor in determining the microfinance industry's overall health as well as its effectiveness as a poverty-reduction tool (Cobb *et al*., 2016).

Theory of Capital Structure

Capital structure theories explore relationship between debt and equity finance and the market value of firms. Some of the theories are stated as in below. Modigliani and Miller theory of capital structure based on their published a seminal work in capital structure where they formulated a theory broadly known ''capital structure irrelevance''. In other words, the capital structure is irrelevant to the value of a firm in perfect capital markets. In other words, they postulated that the value of firm is independent on financial structure based on assumptions: no transaction cost, no asymmetric information, no taxes and same interest rate. They argued that borrowings or debts give a tax advantage where the tax deducted from interest results in tax shield, which in turn reduces the cost of borrowing and maximize the firm financial performance (Ngo 2012). Thus, require financial institution to make a trade-off between cost of debts and the benefits of using debts.

Trade-off theory postulates that firm's optimal debt and equity financing relationship is achieved at the point when the marginal present value of the tax on additional debt is equal to the

increase in the present value of financial distress costs. The theory argues that firm target leverage is driven by three competing forces: i) taxes; ii) costs of financial distress, that is, bankruptcy costs; and iii) agency costs. However, in the real world, there are presences of agency and bankruptcy costs of debt in the real world make its tax benefit exaggerated. This means that there are some threshold levels of debt under which the debt it expected to provide maximum tax benefits (Myers, 1984). Accordingly, when a firm is profitable, they prefer debts to equity because interest paid to leaders is a deductible item to net income before paying corporate income tax. However, one of the demerits of debt is the cost of potential financial distress, especially when the firm relies on too much of it (Ngo, 2012). Ngo argues that such firms target their financial structures using more debts to implement highly efficient output strategies when the past positive return is a good proxy for future return. On the other hand, that firms with low profit prefer internal funds source than external ones may be more expensive and non-debt tax shields may be bigger than the merits of tax benefits. Developed from the prediction, dynamic trade-off theory points out the sole of time, expectations and adjustment costs. The correct financing decision typically depends on the financing margin that the firm anticipates in the next period. This suggests that optimal financial choice today tends to depend on what is expected to be optimal in the next period.

Pecking Order theory was propounded by Myers (1984). The theory provides a preferential order in terms of using different financing instruments. It considers the consequences of debt and equity issues for a firm. It states that firms will consider all methods of financing available and use the least expensive source first. It further suggests that firms should consider financing new projects in the following manner: first use internal equity, next use debt and last use external equity. The important difference is that the equity is divided into two parts, namely, internal equity and external equity. Internal equity is that which is readily available for investment, whereas external equity is that which must be obtained from outside sources. Furthermore, theory argues that firms issuing debt send a positive signal about their future prospects. This also shows that the company has more investment opportunities and growth prospects than it can handle with the internally generated funds.

Agency Cost theory argues that it is inevitable to avoid agency costs in corporate finance. According to Lislevand (2012), agency costs are costs that arise when there are conflicts of interest between shareholders and managers and between debt-holders and shareholders. He argued that these principals have to main problems. They are: i) adverse selection. The implication of this is that selecting the most capable managers; and ii) the problem of moral hazard, because they must give the agents-managers the right incentives to make decisions aligned with shareholder interests. However, Jensen and Meckling (1976) regard agency costs as the sum of: i) the monitoring expenditures by the principal, such as auditing, budgeting, control and compensation systems; ii) the bonding expenditures by the agent; and iii) the residual loss, due to divergence of interest between the principal and the agent. The share price that shareholders pay reflects such agency costs. So, to increase firm value, the agency costs must be reduced (Kyereboah-Coleman, 2007).

Empirical Literature Review

There have been several studies investigating the determinants of capital structure of firms in different business sectors such as electricity and utility companies (Miller and Modigliani, 1966), manufacturing sector, non-profit hospitals, agricultural firms and joint venture-firms (Boateng, 2004). One of the major findings in these studies listed above is that industrial or sector classification is an important determinant of capital structure because different sectors employ different financing structure for their operations (Kyereboah-Coleman, 2007).

There have also been studies reviewed on the

relationship between capital structure and firm performance. Berger and Bonaccorsi di Patti (2006) argued that firm performance and capital structure are closely correlated. Using data of commercial banks from US and the results are consistent with the agency theory, under which high leverage reduces the agency costs of outside equity and increases firm value by constraining or encouraging managers to act more in the interests of shareholders. Abor (2005) shows a significantly positive relation between the short-term debt ratio and profitability measured by return on equity. However, a negative relationship between long-term debt ratio and profitability was established. But in terms of the relationship between total debt ratio and profitability, the results of the study indicated a significantly positive association between total debt ratio and profitability (Abor, 2005). In addition, there have also been numbers of other studies providing empirical evidence supporting this positive relationship between debt level and firm's performance. Abor (2005) argues that capital structure, especially long term and total debt ratios negatively impact performance of small and medium enterprises. There have also been some other studies that have provided empirical evidences supporting this negative relationship between debt level and firm's performance (Cassar and Holmes, 2003).

Studies emphasizing on linkage between capital structure and performance in microfinance institutions have been few. Kyereboah-Coleman (2007) found that most of microfinance institutions used high leverage to finance their operations with long -term debt as against short -term debt. Furthermore, the study shows that highly leveraged microfinance institutions perform better by reaching out to more clienteles, enjoy economies of scale, and therefore better able to deal with moral hazard and adverse selections. The study uses panel data covering a ten-year period, 1995-2004, and consists of 52 microfinance institutions from Ghana. Return on asset and return on equity were used as financial performance indicators; and total debt, short- term debt and long- term debts are used as indicators for capital structure of microfinance institutions. As control variables, size, age and risk level are used (Kyereboah-Coleman, 2007).

Silva (2008) found that total debt and short-term debt ratio impacts positively and significantly on return on equity while negatively and significantly on return on assets. Long- term debt ratio had a positively and significantly impact return on equity but not significantly impact on return on asset of microfinance institutions. This shows that if microfinance institutions use long -term debt to finance their operations, there may not be a pressure on management of microfinance institutions. This further suggests that profitable microfinance institutions depend more on long-term debt financing. The study uses a data set of 290 microfinance institutions from 61 countries. Return on asset and return on equity were used as financial performance indicators, while debt to equity, long- term debt to equity, short- term debt to equity, debt to assets, long-term debt to assets and short -term debt to assets ratios were used as indicators of capital structure of microfinance institutions (Silva, 2008).

Kar (2012) seeks to answer the question "does capital and financing structure have any relevance to the performance of microfinance institutions?" from an agency theoretical standpoint. The results of the study confirm the agency theoretical claim that an increase in leverage raises profit-efficiency. Study also reveals that cost efficiency decreases with decreasing leverage. The study showed that leverage has a negative significant impact on the depth of outreach; however, does not have any significant impact on breadth of outreach. The study uses a panel dataset of 782 microfinance institutions in 92 countries for the period 2000–2007. Return on assets, returns on equity and operating expenses per dollar lent were used as indicators for financial performance. And some of the indicators for capital structure are capital-asset ratio, debt-equity ratio, loans-asset ratio, and PAR> 30 as the indicators for

capital structure and found that an increase in leverage raises profit-efficiency in microfinance institutions. However, Kar concludes that capital structure does not have any noticeable impact on the breadth of outreach. Baraza (2014) also investigated the relationship between funding structure and financial performance of microfinance institutions in Kenya. The study found that debt to equity ratio had a negative correlation with financial performance implies the more debt a firm employs in financing its operations the poorer financial performance it experiences. The study also found that deposits to assets ratio had a positive correlation with financial performance implying that the more deposits a microfinance institution accepts the higher the financial performance.

Ahmed *et al.,* (2018) regard depth of outreach to quality of reach out to the poor. it refers microfinance outreach is very significant since it represents microfinance institutions adherence to the core promise to alleviate poverty through providing financial service to the lowest strata poor population, thus the poorer are clients the greater is the outreach (Quayes, 2012). The depth of outreach is generally measured by the two key variables: average loan adjusted by gross national income (GNI) per capita and proportion of women loan borrowers.

Given above literature review, the following hypotheses are tested on the relationship between identified variables:

H_1: There is no significant relationship between capital structure and financial performance of MFBs in Nigeria.

H_2: There is no significant relationship between capital structure and social outreach of MFBs in Nigeria.

Methodology and Analysis of Results

The study is conducted in Nigeria. It is located in West Africa, and bordered in west by the Republic of Benin; in the north by Niger; Chad and Cameroon to the east; and the Gulf of Guinea in the Atlantic Ocean to the south. The study used panel data obtained from the publications of Microfinance Information Exchange database (MIX-Market), a web-based data online managed by the World Bank; Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) for specific objectives. The panel data set of nineteen microfinance banks out of 69 MFBs covering a period of fifteen years from 2004 to 2018. The MFBs spread across South East, North Central, North West, South South, South West and North East regions respectively. The MFBs were purposively selected because they have availability and up-to-date data of the selected variables for this study. The choice of the series from 2004 to 2018 was informed by the CBN policy of commercialization of microfinance institution. The data were analyzed with autoregressive distributed lag (ARDL) framework and the stationarity of panel data was analyzed with panel unit root tests using Levin, Lin and Chu test (LLC), Im, Pesaran and Shin test (IPS) and Augmented Dickey-Fuller (ADF) tests.

Model Specification

The model follows the pattern of Mongo (2021) to evaluate the impact of capital structure on financial performance and social performance of MFBs in Nigeria. It takes the following form:

1) $\Delta LnROE_{it} = {}_0 + {}_1LnCAP_{it-1} + {}_2LnDER_{it-1} + {}_3LnGLPA_{it-1} + {}_4LnSIZ_{it-1} + {}_5LnINF_{it-1} + e_{it}$ **(1)**

Where:

Δ = *Difference*

$LnROE_{it}$ = log *of return on equity represents financial performance*

$LnCAP_{it-1}$ = log of capital-to- asset

$LnDER_{it-1}$ = log *of debt-to- equity*

$LnGLPA_{it-1}$ = log *of gross loan portfolio and assets*

$LnSIZ_{it-1}$ = log *of total assets*

$LnINF_{it-1}$ = log *of Inflation*

Ln = lagged natural log

${}_1$ - ${}_5$ = *coefficients of the explanatory variables of long-run model*

ECM_{it-1} = *Error correction mechanism*

e_{it} = *error term*

Through a simple linear re-parameterization, the Error Correction Model (ECM) was derived from the ARDL model of equation 1 as follows:

$$2.\ \Delta LnROE_{it-1} = \nu_0 + \nu_1 LnCAP_{it-1} + \nu_2 LnDER_{it-1} + \nu_3 LnGLPA_{it-1} + \nu_4 LnSIZ_{it-1} + \nu_5 LnINF_{it-1} + e_{it} \quad (2)$$

***Where**:*

$\nu_1 - \nu_5$ = *coefficients of the explanatory variables of short-run model.*

All variables are as previously defined in equation 1.

$$3.\ \Delta LnALB_{it} = \gamma_0 + \gamma_1 LnCAP_{it-1} + \gamma_2 LnDER_{it-1} + \gamma_3 LnGLPA_{it-1} + \gamma_4 LnSIZ_{it1} + \gamma_5 LnINF_{it-1} + e_{it} \quad (3)$$

***Where**:*

Δ = *Difference*

$LnALB_{it-1}$ = log *of average loan balance represents social outreach ratio*

$LnCAP_{it-1}$ = log *of capital-to- assets ratio at time*

$LnDER_{it-1}$ = log *of debt-to- equity ratio*

$LnGLPA_{it-1}$ = log *of gross loan portfolio and assets*

$LnSIZ_{it-1}$ = log *of total assets*

$LnINF_{it-1}$ = log *of Inflation*

Ln = Lagged natural log

$\gamma_0 - \gamma_5$ = *coefficients of the explanatory variables long-run model and parameters to be estimated*

estimated.

e_1 = *error term*

Through a simple linear re-parameterization, the Error Correction Model (ECM) was derived from the ARDL model of equation 3 as follows:

$$4.\ \Delta LnALB_{it-1} = \sigma_0 + \sigma_1 LnCAP_{it-1} + \sigma_2 LnDER_{it-1} + \sigma_3 LnGLPA_{it-1} + \sigma_4 LnSIZ_{it-1} + \sigma_5 LnINF_{it-1} + e_{it} \quad (4)$$

Where:

$\sigma_1 - \sigma_5$ = *coefficients of the explanatory variables short-run model and parameters to be*

All variables are as previously defined in equation 3.

Results and Discussion

Diagnostic tests

The normality and panel unit root tests were performed on data set are presented in tables 1 and 2 respectively.

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Table 1: Normality root tests

Variable	Notation	Obs	Mean	Med	Max	Min	Std. Dev	Skewn	Kurtos	Jarque-B	Prob
Return on Equity	ROE	284	9.496	4.685	211.740	-35.12	21.727	5.842	48.180	25770.36	0.0000
Debt to Equity	DER	284	8.962	2.410	189.120	-9.55	26.377	4.416	22.581	5460.46	0.0000
Capital to Assets	CAP	284	39.574	29.535	1214.95	-11.7	83.532	11.231	148.07	255011	0.0000
Gross Loan Portfolio to Asset	GLPA	284	69.311	52.505	1221.11	0.520	114.132	7.847	75.310	64786	0.0000
Total Assets	SIZ	284	19.217	18.764	25.077	10.411	2.865	-0.583	3.961	26.999	0.00001
Average Loan Balance	ALB	284	93.816	68.91	1221.11	9.21	116.038	5.670	47.380	24828	0.0000
Inflation Rate	INF	284	11.329	11.900	15.370	6.6000	2.285	-0.077	2.259	6.784	0.03364

Table 1 presents the normality test for all the variables used for the panel regression. The skewness which measures asymmetry the distribution indicates that all the variables were positively skewed except SIZ and INF which are negatively skewed. On the other hand, the kurtosis which measures the peakedness or the flatness of the distribution series is greater than 3 in as table shows except INF among the series. This suggests that the four out of the series peaked to the surface or leptokurtic relative to the normal distribution. The fact that majority of our variables exhibit and heavy tail phenomenon indicate that linear approach for our model might be biased. The Jarque-Bera normality test statistic shows that all the variables are statistically significant indicating non normality of the distribution.

Panel Unit Root Test Results

Table 2 shows the summary of the results of panel unit root tests. According to Olayungbo (2021), the decision rule is that if the absolute *p*-value of the Levin-Lin-Chu (LLC) test, Im-Pesaran-Shin (IPS) test and Augmented Dickey-Fuller (ADF) test is less than 5 per cent critical value, then it is adjudged that the tested variable is stationary. If, on the other hand, the absolute *p*-value of the LLC test, IPS test and ADF test is greater than 5 per cent critical value, then it is adjudged that the tested variable is non-stationary. Based on this, we applied the LLC, IPS and ADF test on both levels and their first difference with trends and intercept. This was done to ascertain the stationarity properties of the variables to enhance the robustness of our results. It was found that almost the variables were stationary at first difference and as such they are integrated at order one I(1). However, variable such as ROE is stationary at level and thus integrated at order zero I(0). Given that the overall results show that all variables were of mixed order of integration. Based on above, the mixed order I(0) and order I(1) variables suggests the use of autoregressive distributed lag (ARDL) estimation technique becomes the most appropriate method for this study (Adenomon *et al*., 2018).

Table 2: Panel Unit Root Tests Results

Variable	LLC	IPS	ADF	Order of Integration
ROE	-22.5383***	-6.63090***	86.9874***	I(0)
	0.0000	0.0000	0.0000	
CAP	2.57202***	-4.53039***	87.4195***	I(1)
	0.0000	0.0000	0.0000	
DER	-2.25836***	-4.07534***	83.3304***	I(1)
	0.0000	0.0000	0.0000	
GLPA	-4.97688***	4.14795***	82.7172***	I(1)
	0.0000	0.0000	0.0000	
SIZ	-2.44733***	-1.74303**	51.7272**	I(1)
	-0.0072	-0.0407	-0.0418	
ALB	-7.56823***	-2.98879***	66.3821***	I(1)
	0.0000	0.0000	0.0000	
INF	-18.3044***	-11.0763***	155.545***	I(1)
	0.0000	0.0000	0.0000	

Computed by researcher generated from data 2004-2018 (2022) Eview10; ** and *** significant at 5% and 1% level respectively and *p*-values are parentheses

Effect of Capital Structures on Microfinance Performance

This objective is achieved by estimating the impact of capital structures on performance of microfinance banks. In the study, microfinance performances are sub-divided into financial performance and social outreach respectively.

Table 3: ARDL Results of Long–Run Effect of Capital Structures on Financial Performance

Dependent Variable: LnROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LnCAP	0.022	0.029	0.733	0.4649
LnDER	0.218	0.035	6.271	0.000***
LnGLPA	-0.126	0.011	-11.962	0.000***
LnSIZ	1.021	0.072	14.139	0.000***
LnINF	6.507	0.451	14.443	0.000***

Source: Computed by Researcher generated from data 2004-2018 (2020);** = significant @ 5% and *** = significant @ 1% respectively.

Effect of Capital Structures on Financial Performance

Table 3 shows coefficient of debt-to-equity ratio (DER) is positive and significant at 1 per cent level of probability. This shows one per cent increase in debt-to-equity resulted to about 0.22 per cent increase in return on equity (ROE) during the study period. This shows that the more assets are financed through debt, MFBs are expected to experience improved financial performance. This result is consistent with prior study of Annan (2018); and Bayai (2017) who established positive association between debt-to-equity and return on equity of microfinance institutions. Similarly, Adesina *et al.* (2015) found debt-to-equity positively and significantly impact financial performance of banks in Nigeria. In addition, Kyereboah-Coleman (2007) argued that highly leveraged microfinance institutions have higher ability to deal with moral hazards, asymmetric information challenge and adverse selection, and this improves financial performance in the long run. Omare (2017) found debt-to-equity is positively related to improved finance performance of microfinance banks in Kenya. However, this result contrasted with the findings of Berguiga *et al.* (2018) who discovered that leverage exerts negative and significant effect on financial performance of microfinance institutions. The authors opined that the more microfinance institution is indebted the less financially successful it becomes. Similarly, Bayai (2017); and Ngo (2012), found negative association exists between debt-to-equity and financial performance the study of capital structure and financial performance of microfinance institutions in Vietnam and Ethiopia. According to Bayai and Ngo, funding sources have cost implications such as interest paid to investors for debts, dividend paid to owners for equity; and interest paid to depositors for savings. Accordingly, debts increase financial expenses and consequently impacts on net income. Similarly, Kinde (2012) posited that microfinance institutions that financed their lending operations through debt-to-equity often would result to poor financial performance in long-run. This infers that the combination of various sources of capital of microfinance institutions does not improve financial sustainability; and thus, the more microfinance institutions capital structures are finance

through debt-to-equity compared to other sources of finance, the more they are deficient in sustainability. Addition, Lislevand (2012) found an inverse relationship between debt-to-equity and profitability in the study of effect of capital structure on microfinance institutions performance in Latin America, Middle East and Eastern Europe. The study agrees with the agency theory which claims that increases in leverage raises profit efficiently and decreases cost efficiency with decrease of financial leverage (Kar 2012).

The coefficient of gross loan portfolio to assets (GLPA) is negative and significant at one per cent level of probability. This suggested that there is an inverse relationship between GLPA and return on equity. This implies one per cent increase in GLPA leads to about 0.13% decrease in profitability in the long run. This finding is consistent with studies of Shihadeh (2021) who opined that loan portfolios have negative and significant relationship with return on equity and revenues generation capacity of banks. Similarly, Demergu-kent *et al.* (1999) who argued that when microfinance banks deploy larger proportions of their loan portfolios to on-lending operations often lead to reduction in profits in the long run. Accordingly, this is largely due to associated operating costs for monitoring, recovering; and associated risk that automatically increase costs thereby reduces the anticipated revenues. However, this result contradicted Shihadeh (2021) who posited that SME loans from banks result to positive and significant improvement in financial performance of banks, especially revenue generations and return on equity, thus improved financial inclusion in the long run. Similarly, Bekalu *et al.* (2018) who suggested that loan portfolio to assets have a significant and positive influence on profitability. According to Muriu (2011), this means microfinance institutions which dedicate higher proportion of their balance sheets to lending activities being the main source of income to microfinance institutions in sub-Saharan Africa, often create higher return on equity. Jorgensen (2011); and Muriu (2012) pointed that making of loans to individuals and SMEs provides informational advantages because of reduction in intermediation costs and improvement in profitability level. Accordingly, large share of loan portfolio to assets creates more interest for revenues because of the higher risk in the long run.

The coefficient of total assets (SIZ) indicates positive and significant at 1 per cent level of probability. This means one per cent appreciation of total assets of microfinance banks in Nigeria resulted to about 1.021 per cent increase in profits. This finding is consistent with *apriori* expectation theory. The relative market and scale efficiency theory argues that as the size of firm expands, its market and profit increase instantaneously. This result is consistent with Shihadeh (2021) studies who found positive relationship between assets of banks and return on equity arguing that assets improved bank performance which results to financial inclusion in the long-run. Muhammad *et al.* (2019) posited that as financial institutions achieved economies of scale, their profitability increases with increase in size. And in the same vein, Marzieh *et al.* (2017) found positive and significant association between return on assets and return on equity on capital structure and firm performance during global financial crisis. This view is supported by Olusegun *et al*. (2021) who opined that increase in total assets often leads to financial stability thus improves resilience of financial institutions. Similarly, Ajayi and Zahiruddin (2016) equally found positive and significant relationship between assets and financial performance in the study of impact of capital structures on firm performance. However, Yenesew (2014) found contrary results and opined that large microfinance banks in the industry have not significantly enjoyed economies of scales therefore diseconomies existed and this adversely influence their financial performance. Furthermore, total assets are very important determinant of capital structure decisions. Large microfinance institutions have less possibility of default risk, easier access to the capital market and stronger competition. Similarly, Obamuyi (2013) found

inverse association between SIZ and return on assets. The author posited that as banks become large, the bureaucratic procedures associated with on-lending activities negatively affected their financial performance in the long-run.

The coefficient of inflation rate (INF) indicates a positive and significant at 1 per cent level of probability. This suggested one per cent increase in inflation rate resulted to about 0.065 per cent increase in profitability of microfinance banks. These findings are consistent with Adair and Berguiga (2017); and Berguiga, *et al.* (2018) who reported that high inflation rate encourages microfinance institutions to raise nominal rates applied to customers to cover inflation costs, to avoid deterioration in their loan portfolio and this eventually improved their financial performance. Furthermore, the results are supported by Baba and Nasieku (2016) who revealed positive correlation between inflation rate and financial performance of banks. Similarly, Churchill *et al.* (2015) confirmed the findings and posited that microfinance institutions financial performance is resilient to inflationary environment. However, these findings are inconsistent with studies of Farooq *et al.* (2021) and Sultan *et al.* (2020) found inverse and significant association between inflation and financial performance of banks. Similarly, Sahyouni and Wang (2019) reported that an anticipated rise in inflation may harm profit margins as interest rates on loans rise, resulting to loan defaults and premature terminations. Nzuve (2016) stated that inflation and financial performance of microfinance institutions have an inverse relationship. The inflationary pressure has negative consequences on financial performance through credit market frictions and economic growth in short-run.

Test of Hypothesis

H_{01}: capital structure of microfinance banks has no significant effect on their financial performance in Nigeria.

Since t_{cal} (6.271) > t_{tab} (2.552) at 1% level of probability, the study rejected the null hypothesis (H_{01}) which states that capital structure (DER) of microfinance banks has no significant effect on their performances. Therefore, the study accepted the alternative hypothesis that the capital structure of microfinance banks has a significant effect on their financial performances in Nigeria.

Table 4: ARDL Results of Short-run Effect of Capital Structures on Financial Performance

Dependent Variable: LnROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ECT	-0.247	0.093	-2.656	0.009***
D(LnCAP)	0.140	0.144	0.974	0.332
D(LnDER)	0.406	0.342	1.187	0.237
D(LnGLPA)	0.016	0.023	0.691	0.490
D(LnSIZ)	0.352	0.643	0.547	0.585
D(LnINF)	8.104	3.647	2.222	0.028
C	-2.061	1.425	-1.446	0.150

Source: Computed by researcher generated from data 2004-2018 (2022); ** = significant @ 5% and *** = significant @ 1% respectively

Table 4 shows the coefficient of error correction term (ECT) is negative with estimate as -0.2475 with *p*-value 0.009 and significant at 1 per cent level of probability. The coefficient shows the speed of adjustment of correction in the long run. It implies that the error or disturbance is corrected at the speed of 24.75% per annum in long-run.

Effect of Capital Structures on Social Outreach

Table 5: ARDL Results of Long-run on Effect of Capital Structures on Social Outreach

Dependent Variable: LnALB

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LnDER	-0.0020	0.0007	-2.8571	0.0044**
LnCAP	0.0327	0.0033	9.8739	0.000***
LnGLPA	-0.0086	0.0012	-7.1055	0.000***
LnSIZ	0.2913	0.0379	7.6823	0.000***
LnINF	0.9613	0.0358	26.8216	0.000***

Source: Computed by researcher generated from data 2004-2018 (2022); ** = significant @ 5% and *** = significant @ 1% respectively

Table 5 shows debt-to-equity ratio (DER) is negative and significant at 1 per cent level of probability. This indicates inverse relationship between average loan balance (ALB) and capital structure of microfinance banks. This implies that one per cent increase in leverage resulted to about 0.021 per cent decrease in the average loan balance per borrower. This suggested as microfinance banks raise the level of debt in their capital structure, the number of active borrowers increases and average loan per borrower falls. This finding is consistent with Chauhan *et al.* (2020) who posited that leverage has a positive impact on the performance of microfinance banks serving larger number of persons without having loan portfolio at risk because leverage has negative relation with portfolio at risk. The results are consistent with profit incentive theory indicating that higher commercial debt enhances the capital base of microfinance banks and helps in increasing earnings. It further shows that adequate capital in microfinance institutions helps in expanding their services to the poor by providing small loans (Chauhan *et al.* 2020). Similarly, Ahmed *et al.* (2018); and Quayes (2012) found impact of depth of outreach on financial performance was positive and significant. The results are in line with those of Mayer and Sussman (2004) that high debt in the capital structure improves the outreach and economies of scale, thereby improving their ability to cope with moral hazards and adverse selection. However, these findings are inconsistent with prior findings of Bayai (2017); Johnson (2015); and Kinde (2012) who noted that debts are generally very costly and therefore should not be used to fund costly small loans required by the poor. The authors argued that many African microfinance institutions lend at higher interest rates than the cost of debts in order to attain financial sustainability; and the costly debts make loans generally too expensive for the poor. Additional huge administrative costs are attached to small

loans meant for the poor and imply that debts limit depth of outreach. Similarly, Khachatryan *et al.* (2017) opined that highly leverage microfinance institutions focus on serving the wealthier clients. Ahmed *et al.* (2018) found that highly leverage microfinance institutions reduces depth of outreach; that is, place less attention in serving the poor segments of the society with financial services. This suggested that as microfinance institutions increase in the average loan size, less attention is paid to the poor clients. Annan (2018); and Islam and Nasreen (2018) observed leverage in form of borrowing promotes scale of operation at the detriment of depth of outreach. On this note, Bayai (2017) pointed that as leverage decreases; the size of the average loan also increases, suggesting reduction in depth of outreach. The author explained that as microfinance institution takes on more debts in order to pursue financial objectives, poverty reduction is compromised.

The coefficient of capital-to- assets ratio (CAP) is positive and significant at 1 per cent level of probability. This implies 1 per cent increase in CAP resulted to about 0.033 per cent increase in average loan sizes. This finding is consistent with Annan (2018) who found a positive association between capital-to-assets and the average loan size. This indicates capital assets drive microfinance institutions to focus less on vulnerable clients. Supporting the findings, Ahmed *et al.* (2018) postulated that the more capital assets at the possession of microfinance institutions the less they focus on depth of outreach. The authors opined that as microfinance institutions focus less on poverty reduction and simultaneously promoting financial performance. Furthermore, Johnson (2015) submitted that as capital assets or paid-capital increases depth of outreach decreases. The author argued that as capital-to-assets increase, microfinance institutions increase their average loan size. This implies changing from social objectives to financial objectives in order to achieve financial sustainability in the long run. This may partly due to concentration on wealthier clients rather than low clients so as to reduce operating costs. However, these results are not consistent with Ahmed *et al.* (2018) findings which indicated that inverse relationship reflects reducing capital-assets means increasing leverage resulting to improvement in depth of outreach. Similarly, Bayai (2017) opined that equity contributions comes at a low cost and this could further deepen depth of outreach hence there is a significant and positive link with depth of outreach in the long-run. The author concluded that capital assets or equity enhances depth of outreach, that is, reduces the average loan size therefore low-income householders are provided with financial services in form of loans.

The coefficient of gross loan portfolio and assets (GLPA) shows a negative relationship with average loan size and significant at 1 per cent level of probability. This means one per cent increase in loan portfolio resulted to about 0.0086 per cent marginal decrease in average loan size. This shows that as microfinance institutions increase the capacity in serving the poor segment of the society, this in the long-run results to poverty reduction (depth of outreach) progressively. This suggests increase in loan portfolio motivates microfinance institutions to focus more attention on vulnerable clients. These findings are consistent with Ahmed *et al.* (2018) who opined that loan portfolio to assets inverse relationship indicates a fall on focus on-lending impedes the depth of outreach. The result shows that emphasizing on-lending ensure serving the ultra-poor and increase the quality of outreach. However, Rizkiah (2019); and Aslam *et al.* (2019) found a positive and significant relationship between loan portfolio to asset and loan size per borrower due to the

fact that microfinance institutions are largely driven by relationship lending and microfinance institutions could achieve higher return on assets through large loan portfolio.

The coefficient of total assets (SIZ) is positive and significant at 1 per cent level of probability. This suggests a positive relationship between SIZ and average loan size per borrower (ALB). This indicated 1 per cent increase in total assets resulted to about 0.291 per cent shifting from smaller to large scale of loans disbursement. This portrays increase in depth of social outreach. This means larger assets associate with large scale of loans disbursement; that is, increase in scale and scope by microfinance institutions. This shows that as asset base of microfinance institutions increase there is tendency for microfinance institutions to source capital from commercial banks and other sources in order to secure solid capital structures to finance large scale of loan disbursement. This contributes to increased social outreach of microfinance institutions. The findings are in conformity with Ahmed *et al.* (2018) posits that large assets of microfinance institutions encourages them to shift from smaller to bigger scale of loans disbursement. That microfinance institutions with huge amount of capital want to take control of the market and keep penetration in a wider scale. Furthermore, Millson (2013) opined that increased in assets of microfinance institutions leads to increase of average loan size per borrower and by implication reduces depth of outreach thus focus on wealthier clients instead of the low-income households. In addition, Armendarz and Szafarz (2011) found a positive association between assets of microfinance institutions and average loan size. Bogan (2012) found positive relationship between assets of microfinance social outreach measures by numbers of borrowers and size loans. Similarly, Ibrahim and Mohamed (2020) show that as assets increase depth of outreach decreases. The authors argued that the more assets at disposal of microfinance institutions, the greater the opportunity for commercial lending. That is, with increase in assets the average loan size per borrowers becomes larger at the expenses of poorer segment of the society therefore mission drift occurs at this point because the poor clients are gradually being crowded out. Johnson (2015) opined that with increase in the size of assets motivated microfinance institutions to take on more commercial debt and the pressures on financial performance takes central objective than social outreach objective because it becomes more profitable lending large loan per borrower than small loans because of associated costs such as transaction cost and monitoring cost incurred in every transaction. This by implication suggests inverse relationship between assets and depth of outreach indicating as assets increase, outreach to poorer segment of the society is expected to decrease.

Further, the coefficient of INF is positive and significant at 1 per cent level of probability. This infers a direct relationship between inflation and average loan size per borrower. This suggested that 1 per cent increase in inflation resulted to about 0.96 percent increase in average loan size. This implies that an increasing inflationary rate deepens the focus on depth of outreach of microfinance institutions. The results agreed with Berguiga, *et al.* (2017) who found positive and significant relationship between inflation rate and financial performance; and there is positive and insignificant relationship between INF and ALB. Shahzad (2015) revealed that inflation increases scale of operation by extending services to large number of active clients with small loans. This suggests that in high inflationary environment, microfinance institutions are motivated to expand their social outreach by serving large number of active borrowers.

Test of Hypothesis

H_2: There is no significant relationship between capital structure and social outreach of MFBs in Nigeria.

Since t_{cal} (2.8571) > t_{tab} (2.552) at 1% level of probability, the study rejected the null hypothesis(H_{02}) which states that capital structure (DER) of microfinance banks has no significant effect on their social outreach. Therefore, the study accepted the alternative hypothesis which states that the capital structure of microfinance banks has a significant effect on social outreach in Nigeria.

Table 6: ARDL Results of Short-run on Effect of Capital Structures on Social Outreach

Dependent Variable: LnALB

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ECT	-0.2521	0.1036	-2.4334	0.0161
D(LnDER)	0.0177	0.0349	0.5089	0.6116
D(LnCAP)	0.0029	0.0100	0.2932	0.7698
D(LnGLPA)	-0.0035	0.0056	-0.6213	0.5353
D(LnSIZ)	-0.0290	0.0633	-0.4574	0.6481
D(LnINF)	0.6626	0.1635	4.0516	0.0001
C	0.8034	0.4861	1.6529	0.1005

Source: Computed by researcher generated from data 2004-2018 (2022); ** = significant @ 5% and *** = significant @ 1% respectively

Table 6 shows the coefficient of error correction term (ECT) is negative with estimate as -0.2521 with *p*-value 0.0161 and significant at 5 per cent level of probability. The coefficient shows the speed of adjustment of correction in the long run. It implies that the error or disturbance is corrected at the speed of 25.2 per cent per annum.

Conclusion and Recommendations

The study has shown that there is long run equilibrium relationship between capital structure and financial performance on one hand; and social outreach of MFBs on the other hand. The findings indicate that debt-to-equity ratio is significant in explaining both financial performance and social outreach of MFBs operating in Nigeria in 2004-2018. This indicates that leverage plays significant role in financial sustainability for enhancing social outreach of MFBs thus a key promoter of financial inclusion. Therefore, from the findings, the study strongly recommends policy that will promote financial sustainability of MFBs because it influences financial inclusion in the long run.

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