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Determinants of Microfinance Bank Lending in Nigeria

Omogbai, C. A. Ph.D[1*] & Imonie, E. G. Ph.D[2]
[1]Department of Banking and Finance, Ambrose Alli University, Ekpoma, Edo State, Nigeria.
[2]Department of Public Administration, Ambrose Alli University, Ekpoma, Edo State, Nigeria.
Correspondences: courageomogbai@aauekpoma.edu.ng; imonieehichoya@aauekpoma.edu.ng

ABSTRACT: The study examined the determinants of microfinance bank lending in Nigeria for the period of 1994 – 2023. The study employed both the cointegration technique and the error correction mechanism to ascertain the short run and long run relationship between the dependent variable and the explanatory variables. The descriptive statistics was also used to describe the nature of variables in the data set. The data were sourced from the CBN Statistical Bulletin, 2023. The variables used in the study are Microfinance Banks' Loans and Advances, Liquidity Ratio, Investments, Lending interest rate, cash reserve ratio and total deposits. Investment has a positive and significant impact on micro-finance bank lending in both the short and long-runs, The current total deposit has a positive and significant impact on microfinance bank lending in the short-run, while total deposit has positive and not statistically significant impact on microfinance bank lending, Liquidity ratio has a positive and not statistically significant impact on microfinance bank lending in Nigeria in the short-run, while the impact of liquidity ratio is negative and not statistically significant in the long-run, that lending rate has a negative and not statistically significant impact on microfinance bank lending in the short-run, while the lending rate has a positive and not statistically significant impact on microfinance bank lending in the long-run, Cash reserve ratio (current and previous) has a negative and not significant impact on microfinance bank lending in the short-run, although cash reserve ratio impact on microfinance bank lending in the long-run is positive and not statistically significant. The study recommends that Microfinance institutions should increase their investments in order to increase the size of their credit portfolio. This will give them more repository resources from which they can lend to the real sector of the economy which contribute to the overall economy.

Keywords: Microfinance banks lending, Investment, total deposits

1. INTRODUCTION

The advent of microfinance banks in Nigeria is due to the inability of Nigerian Deposit Money Banks to provide sufficient financial services to meet the demands of financial inclusion. Microfinance banks have taken up the challenges of the gap created by the Nigerian deposit money banks. Microfinance banks can be seen as an economic growth mechanism intended to reduce poverty in the low-income part of a given country like Nigeria. Microfinance bank is one of the most important savings mobilization and financial resource allocation institutions because they

mobilize funds from the surplus sector and channel such funds to the deficit sector; and in the case of microfinance banks the deficit sector are low income groups, as well as the Small and Medium Scale Enterprises (SMEs) who are the main engine of growth and development in any country (Yususff, 2019). This therefore makes the microfinance bank an important phenomenon in the economic growth and development of a nation. In performing this role, it must be realized that micro finance banks have the potential, scope and prospects for mobilizing surplus financial resources and allocating them to productive investments.

Lending is one of the services that microfinance banks do render to their customers. In other words, microfinance banks, grant loans and advances to low income groups as well as small and medium scale enterprises in order to enable them embark on investment and development activities as a means of aiding their growth in particular or contributing toward the economic development of a country in general (Akpere, 2016; Ekwunife, Nduka & Ogini, (2022) .Lending practices in the world could be traced to the period of industrial revolution which increased the pace of commercial and production activities thereby bringing about the need for large capital outlays for projects. Many captains of industry at this period were unable to meet up with the sudden upturn in their financial requirements and therefore turned to the banks for assistance (Monogbe, Omotayo, Achugbu & Nduka, 2016). However, the emergence of banks in Nigeria in 1872 with the establishment of the African Banking Corporation (ABC) and later appearance of other banks in the scene during the colonial era witnessed the beginning of banks' lending practice in Nigeria. However, the lending practices of the then colonial banks were biased and discriminatory and could not be said to be a good lending practice as only the expatriates were given loans and advances. This among other reasons led to the establishment of indigenous banks in Nigeria (Ekpenyong & Nnamocha, 2019; Aniefor, Nduka, Ananwude & Ezeaku, 2021).

However, microfinance banks' decisions to lend out loans are determined by a lot of factors such as their total deposits, national economic performance, lending interest rate, cash reserve ratio investment and liquidity ratio, to mention a few. The focus of this study is to examine the determinants of microfinance banks' lending in Nigeria.

Many factors may affect the ability of microfinance banks' to lend to the poor. Wachukwu and Onyema (2018) opine that the factors affecting microfinance banking lending are total deposit, cash reserve ratio, investment, liquidity ratio and lending interest rate. The emergence of microfinance banks is traceable to the virtual exclusion of poor people from the formal financial system. Due to the lack of access to formal financial services, the poor has developed a wide range of informal community-based financial arrangements to meet their financial requirements.

Microfinance banking was created to fill this vacuum. Microfinance banks grant small scale loans and advances to poor entrepreneurs in order to create a mechanism to alleviate poverty by providing the poor and destitute with resources that are available to the wealthy. This is because small scale businesses are the fundamental basis for building a competitive environment, as well as the basis for forming a middle class society (Isabel & Begona, 2018; Nduka, Okolie & Ngangah, 2025).

Even though micro-finance banks are created to assist the poor to grow their businesses, inadequate funding to perform this function have been the major challenge. This funding is not available now and that is why many of them are on the verge of fading away

(Abiodun & Ogundife, 2021; Nduka, Ananwude & Osakwe, 2019). Deposit money banks traditionally lend to medium and large enterprises which are judged to be creditworthy but because the interest rate on treasury bills is high, deposit money banks are now encouraged to invest their loanable funds in treasury bills therefore making access to loanable funds less available to micro and medium enterprises including microfinance banks. This saddles the MFBs with the increased burden of having to mobilize more deposits from the grassroots in order to effectively play their economic role of providing credit facilities to small enterprises due to little access to needed credit for growth from the Deposit money banks. Most extant studies such as examined the impact of macroeconomics variables on microfinance bank lending, but did not give due consideration to the determinants of Micro Finance bank lending such as interest rate, cash reserve ratio total deposit, liquidity ratio and investment. Therefore, this current study intends to examine the determinants of micro banking.

2. LITERATURE REVIEW

Bank Lending

Chen and Lu (2021) opine that banks are in the right position to evaluate the future potentials of good investments as they have much more experience in doing that with similar investments. Notwithstanding, these specialties, banks are more circumspective about their lending decisions. Lending decisions are influenced by a host of factors as explained below. One of the underlying factors for lending decision is the level of bank capital. The effects of bank capital on lending behaviour have been widely debated since the 1988 Basel Capital Accord (Gambacorta and Mistrulli, 2004).

According to Abiodun and Ogundipe (2021) one of the important points which a banker must clear upon receipt of a request for credit facilities is the legal capacity of the borrower. For incorporate companies the banker is obliged to examine the Memorandum and Articles of Association carefully to make sure that the lending is within the authority of the directors.

It has been acknowledged as a crucial component for the poor and low-income individuals in the fight against poverty (Usifoh & Ezeanyeji, 2017). Microfinance, according to Ekpenyong and Nnamocha (2019), literally refers to the development of financial systems that effectively and efficiently address the requirements of the underpriviledged. Microfinance is the provision of a wide range of financial services, including savings, loans, payment services, money transfer, and insurance to the underpriviledged and low-income individuals, households, and their microbusinesses.

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Total Deposit

The total deposit of a bank is the summation of demand deposits, term deposits and interest and non-interest bearing deposit. Total deposit is the term included in a bank's balance sheet. The word deposit most often implies the act of placing money in the safety of a bank. When calculating the total deposits from a bank's perspective, various kinds of deposits are taken into consideration. These are added together to arrive at the total deposit. Demand deposit is money placed in an account with a bank or a financial institution that can be withdrawn anytime by the depositor. Majority of deposit accounts are checking and saving account. Usifoh & Ezeanyeji, 2017).

Term deposit can be a saving account or certificate of deposit that pays a fixed rate of interest until a given maturity date, funds deposited in a term deposit cannot be withdrawn prior to the maturity or this fund can be withdrawn with advanced notice and/or by having a penalty assessed.

Investment

Investment is the current commitment of funds for a period of time for the purpose of obtaining a return, so that the return will compensate the investor. The problem of surplus funds gave rise to the question of where to invest. A wide variety of investment avenues are open to the investors to suit their needs and nature. Three basic factors usually guide investors action when investing, these are quantum of fund that is available for investment, expected return from investment and the risk tolerance of the investor. The investment alternatives range from financial securities to traditional non-security investments. The financial securities may be negotiable or non-negotiable (Fadare & Oyedeko, 2018; Anusi & Nduka, 2022).

The various forms of investment avenues available are jointly called investment portfolio, and these investment portfolio influences bank lending to a reasonable extent. The investment environment within which a deposit money bank operates is of paramount importance in making its lending decision. For instance, in the period of economic boom, businesses demand for loans and advance to take advantage of expansion and banks investment opportunities equally go up. On the other hand, in periods of economic recession, demand for credit plummets. This provides a pro-cyclical relationship between economic growth and bank lending (Ladime et al, 2013; Nduka, Atueyi, Osakwe, & Mbanefo, 2021).

Lending Interest

The word interest means the price we pay for borrowing money, while rate is the percentage attached to the interest. The cost of borrowing money, measured in naira, per year naira, borrowed, is the interest rate. Interest rate connotes the time value of money as it is the rate at which an amount of money accrues over time. In economic theory, interest is the price paid for inducing those with money to save it rather than spend it, and to invest in long-term assets rather than hold cash. Rates show the interaction between the supply of savings and the demand for capitals or between the demand for and the supply of money. Interest rates are different mainly in terms of maturity. We have nominal or real interest rate. Nominal interest rate can be measured in terms of naira and not in terms of goods. The nominal interest rate measures the yield in naira terms per year, per naira invested while the real interest rate is adjusted for inflation and is calculated as the nominal interest rate less the rate of inflation (Pandey, 1999). Jhingan (2005) defined interest rates as the rental payment for the use of credit by borrowers and return for parting with liquidity by lenders. Wikipedia (2005) defined interest rate as the rate at which interest is paid by a borrower for the use of money that they borrow from a lender. It can also be said at a rate which is charged or paid for the use of money is usually expressed as an annual undertaking.

There is a general consensus among economists and policymakers that monetary policy works mainly through interest rates. When the Central Bank of Nigeria tightens policy through a decrease in reserve provision, the effect of this is that the reserve of bank will be reduced thereby their credit expansion ability.

Cash Reserve Ratio

The Central Bank of Nigeria sets minimum reserve requirement for the cash reserves that banks must hold. This is referred to as cash reserve ratio. The reserve requirement (i.e. cash reserve ratio) is a Central Bank regulation that sets the minimum portion of customer deposits that each bank must hold as reserves. These require reserves are normally in the form of cash held physically in a bank vault or cash deposits with the Central Bank. This cash reserve ratio is sometimes used as a monetary policy instrument by the government through its Central Bank in influencing the country's borrowing and interest rates by adjusting the amount of funds available for banks to grant as loan and advance to their customer.

The reserve requirement can be used as an instrument of monetary policy, because the higher the reserve requirement ratio sanctioned by the Central Bank, the less funds banks will have to loan out as loan and advances, leading to lower money creation and perhaps bringing about higher purchasing power of the money previously in use (Kimani, 2024).

Liquidity Ratio

A bank is said to be liquid if it has sufficient cash and other liquid assets, and the ability to raise funds quickly from other sources, to enable the banker to meet its payment obligations and financial commitments in an urgent manner. The minimum proportion of banks asset which they are legally required to keep in liquid form is what is known as liquidity ratio. Liquidity ratio can also refer to the proportion of total deposit liabilities which banks are required to keep liquid by law (Saidenberg & Strahan, 2019).

The Central Bank of Nigeria is charged with the authority of fixing and controlling liquidity ratio of deposit money banks in Nigeria. The proportion of liquidity to hold and in what form to hold is a constant concern of bank's management. The main purpose of liquidity ratio was to provide deposit money bank with cash in some proportion to deposit, that is, it was designed to provide a primary line of defense for a bank in meeting depositors withdrawals either by hand, in cash or by cheque.

Theoretical Framework

The theoretical framework will be based on the Schumpeter (1911) theory of finance and growth which can also be derived from the neoclassical growth model by incorporating financial development into the simple model. Thus, from the simple production function, financial development variables are included as the shift parameter in addition to the usual factors of production to form the unrestricted neoclassical growth model. However, the neoclassical growth model is limited due to the fact that technology is treated as an exogenous factor. Therefore, the endogenous growth theory is better in explaining the relationship between finance and growth; Loayza and Claudio, (2006). The relationship can be presented using the aggregate production function as shown below:

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

Where:
Y = Output
K = Capital
L = Labour
A = Shift parameter which captures financial development
A = f(FD) where FD is financial development.

From the above aggregate equation, output is a function of not only the factors of production, capital and labour but also financial development. When we introduce growth rates, the equation becomes:

$$\frac{dY}{Y} = \frac{dA}{A} + a_k\frac{dK}{K} + a_l\frac{dL}{L} \quad \text{……………………………………………} (2)$$

Where:
dK = investment

Thus, the level of financial development is assumed to affect the growth rate of efficiency and hence economic growth. From equation 1 and 2, the "Schumpeter relationship" can be derived as:

$$x = x\{k\} \quad \text{…………………………………………………………..} (3)$$

This states that since the rate of technology (x) depends on q, which in turn, depends on k, x is a function of k, the capital efficiency per unit.

Empirical Studies

Chen and Lu (2021) looked at evidence from Chinese city banks to assess the influence of macroeconomic conditions on bank efficiency. According to the findings, bank efficiency at Chinese City commercial banks is correlated positively with per-capital GDP but negatively with the ratio of urban residents. The influence of macroeconomic factors on bank efficiency, however, varied significantly across the eastern and non-eastern regions. The macroeconomic environment has a greater overall impact on the effectiveness of Chinese city commercial banks in eastern regions.

In Nigeria, Abiodun and Ogundipe (2021) looked into the dynamic nature of the link between microfinance banks and the expansion of the financial system throughout a time period spanning from 1992 to 2018. The CBN statistics Bulletin was used as the source for secondary data, and the auto regressive distributed lag bound test and its accompanying short and long run coefficients were used for analysis. The long-term association between microfinance bank institutions and financial sector expansion was found to be equivocal. Long-term research has shown that investments have considerable negative effects on the expansion of the financial industry whereas microfinance bank deposits and assets have little beneficial effects. The study came to the conclusion that the growth of Nigeria's financial industry is positively and marginally influenced over the long term by microfinance bank institutions.

Using longitudinal data from 2009 to 2018, Majeed et al. (2021) evaluated the impact of CEO education, macroeconomic conditions, and banking performance in the context of Pakistan and China. The connection between the dependent and independent variables was examined using the Ordinary Least Square (OLS) approach. The size of the bank has a considerable, although unfavourable, relationship with its profitability, according to the findings. The necessity of the economy of scale for the profitability of Pakistani and Chinese listed banks was also made clear. The

profitability and effectiveness of Pakistani and Chinese listed banks are strongly correlated with the CEO's education and macroeconomic variables including GDP, inflation and exchange rates.

In their study, Ekpenyong and Nnamocha (2019) looked into the underwhelming performance of the microfinance institutions in Nigeria over the previous 20 years. The findings shows that, as graphically demonstrated in the study, microloans from microfinance institutions had a favourable influence on the chosen macroeconomic sector, increased sectoral productivity in the nation, and had a beneficial impact on Nigeria's gross domestic product. The study identified several subsectors of the economy that will benefit from a significant improvement in the operational modalities of the microfinance institutions, including agriculture and forestry, mining and quarrying, manufacturing and food processing, real estate and construction, transport/commerce, and others. The impact of macroeconomics factors on the liquidity position of microfinance banks in Nigeria was studied by Yusuff (2019). Through the use of a vector error correction mechanism, data on the microfinance liquidity ratio, real GDP growth rate, inflation rate, and interest rate were analyzed. The study's findings indicated that there is little to no macroeconomic influence on the liquidity of microfinance institutions. The study came to the conclusion that the macroeconomic environment in Nigeria had little bearing on the liquidity of microfinance institutions.

Using both static and dynamic panel estimating techniques, Koju et al. (2018) assessed macroeconomic and bank-specific factors on non-performing loans (NPL) in the Nepalese banking sector. The results demonstrate that NPLs have a negative link with GDP growth rate, capital adequacy, and inflation rate and a positive relationship with the export to import ratio inefficiency and asset size. It was determined that the study's conclusions would be useful in developing Nepal's macro prudential and fiscal policies.

The moderating impact of economic growth on the relationship between the growth of the financial system and the activities of the microfinance industry was examined by Isabel et al. (2018). It was discovered that the relationship between the development of the financial sector and microfinance activity is influenced by the level of economic growth using the generalized method of moments as the estimation technique. When there is low economic growth, the growth of the financial sector has a negative impact on the activity of the microfinance sector; however, when there is strong economic growth, the growth of the financial sector has a positive impact on the activity of the microfinance sector.

The effect of microfinance banks on Nigeria's economic growth from 1992 to 2016 was studied by Wachukwu et al. (2018). Using Cochran-Orcutt regression to evaluate data from the CBN Statistical Bulletin, it was discovered that investment growth and increase in microfinance bank lending were both strongly but adversely correlated with real gross domestic product. Real gross domestic product and the growth of assets at microfinance banks were positively and strongly correlated. According to the Granger causality test, there is a bidirectional causal relationship between real gross domestic product and the growth of microfinance bank credit as well as between real gross domestic product and the growth of microfinance bank assets.

Nnamocha, et al. (2017) looked into the relationship between the growth of micro, small and medium sized businesses in Imo state and the influence of microfinance

institutions. The analysis of the collect primary data used Likert Scale revealed that more men are involved in MSME than women. According to research, MSMEs with the highest levels of profitability will create more jobs and boost the economy. Another finding suggests that the gender of the business owner has an impact of the business owner has an impact on how successfully MSMEs operate. According to the study's findings, MFIs should lower the interest rates on the loans they give MSMEs in order to promote their expansion, and then idea of MSME development should be updated to include a cutting-edge technology foundation.

3. METHODOLOGY

The study adopted the longitudinal survey (ex-post-facto) research design. This method entails the use of historical data to gain knowledge about some phenomenon over a period of time, as well as quantitative, statistical or regression techniques in evaluating the research issues or problems. The design is to enable the researcher to ascertain the impact of the independent variables on the dependent variable. The population of the study is the entire microfinance banks in Nigeria for the period of thirty years (1994-2023). The choice of this period is informed by the need to cover the period of global financial meltdown so as to capture the effect on microfinance bank in Nigeria. The study employed the secondary data. The data was sourced from the Central Bank of Nigeria Statistical Bulletin of 2019.

Model Specification

This study builds on the works and contributions to the model of Schumpeter (1911) which explains theory of finance and growth derived from the neoclassical growth model by incorporating financial development into the model. Thus, in line with the hypotheses stated above, the main issue is the determinants of the microfinance bank lending and other explanatory variables that have been identified through literature and theory such as total deposits, investment, lending interest rate, cash reserve ratio, liquidity ratio. Other factors not explicitly included in the model are policy instruments for regulation of banks operation like government control and monetary authorities' guidelines and past relationships with customers. These are captured by the error term in the model. The model adapted for this study was the study by Usman (1999) that banks' lending should vary from time to time with the variables expressed.

The functional form of the model is therefore specified thus:

MFBLA = f(LQR, INV, LR, CSR, TDP)

The econometric form of the model is specified thus:

$MFBLA = \beta_0 + \beta_1 LQR + \beta_2 INV + \beta_3 LR + \beta_4 CSR + \beta_5 TDP + \mu$

Where:

MFBLA = Microfinance Banks' Loans & Advances (the proxy for bank lending)
LQR = Liquidity Ratio
INV = Investments
LR = Lending Interest rate (microfinance bank lending rate)
CSR = Cash reserve ratio
TDP = Total Deposits
μ = error term controlling for unit-specific residual in the model
β_0 = intercept of the regression line

Aprori expectation $b_1, b_2, b_4 > 0$ while b_3 and $b_5 < 0$

Method of Data Analyses

In order to properly analyse the data, we adopted the following methods. Firstly, the data series for the variables in the model are tested for stationarity. Testing for stationarity helps to avoid the possibility of spurious parameters that could result when two or more non-stationary data series are regressed. According to Engle and Granger (1987), the regression of two non-stationary variables on each other produces spurious and inconsistent parameter estimates. The Augmented Dickey-Fuller (ADF) unit root test was employed in this study to test the stationarity of variables. The variables passed the unit root test at levels 1(0) or first difference 1(1) before they were entered for empirical estimation.

Secondly, the Engel and Granger two-stage technique was used to determine whether or not there is a long-run relationship between the dependent variable and the explanatory variables. Finally, the error correction mechanism (ECM) was used to capture the relationship between the short-run dynamics of the economy and the long-run equilibrium of the economy so as to correct for any temporal deviations in the model. The autoregressive distributed lags (ARDL) approach was used in estimating the ECM model while the adjusted R-squared Criterion and information criteria are used in selecting the parsimonious model from the over-parameterized models.

4. RESULT AND DISCUSSION

Table 4.1 presents the descriptive statistics and other basic characteristics of the data set contained on table in the appendix. The descriptive statistics show that the average micro finance bank lends loans and advances (MFBLA) is 22227.2. The median value of 7132.9 is much higher than the mean value and indicating the effect of heterogeneity in terms of size of loans. The corresponding average values for liquidity ratio, lending rate, cash ratio, total deposit and investment are 58.6, 18.6, 6.1, 31835.4 and 2716.1. The maximum values of 94055.6 for microfinance bank lending, 121787.6 for total deposit and 8959.8 for investment are relatively high, when compared with their corresponding relative low minimum values of 135.8, 639.6 and 118.4, giving clear indications that these values moved rather diametrically over the period of the study. The wide dispersion is confirmed by their relatively high standard deviation value which are 28362.8, 36099.7 and 2996.9 respectively, with that of other variables assuming relatively low values. The skewness values for all the variables are low and positive, an indication of low positive skewness for the variables used. All the Kurtosis values are close, they are not too far from 3, an indication of the absence of extreme values which may generate heteroskedastic variations in the data. The J-B values are low and fail the significance test at the 5 percent level, which indicates that the density function of the series is normally distributed.

Table 4.1 Descriptive Statistics

	Mean	Median	Max.	Min.	Std. Dev.	Skew	Kurt.	J-B
MFBLA	222227.2	7132.85	94055.6	135.8	28362.8	1.23	3.33	5.65
LQR	58.56	59.0	83.3	36.4	13.1	0.079	2.02	1.243
LR	18.63	18.29	29.80	9.25	4.23	0.31	3.71	1.12
CSR	6.07	5.75	15.00	1.00	3.74	0.43	2.20	1.74

IDP	31835.4	138710	121787.6	639.6	36099.7	1.05	2.97	4.01
INVEST	2716.1	1593.3	8959.8	118.4	2996.6	1.02	2.70	3.92

Source: Data Computation using E views 8.0

Correlation Analysis

To check for the nature of correlation between the variables in order to determine the extent of the within a unit. Clustering our first procedure is to compute the correlation matrix using Eviews 8.0 contained on table 4.2 below. The correlation analysis is used to conduct these investigations. The result of the correlation tests are reported in table 4.2 below. In the correlation matrix, a positive relationship is observed between microfinance bank lending, cash reserve ratio and total deposit, while a negative relationship is observe between microfinance bank lending and liquidity ration and lending rate. This implies that rising cash ratio, total deposit and investment tend to induce rising microfinance bank lending in Nigeria, while liquidity ration and lending rate tend to have the opposite effect on microfinance bank lending.

The correlations among the independent variables indicate that liquidity ratio is positively correlated with lending rate, total deposit and investment, while it is negatively correlated with cash ratio. In the same vein, a positive relationship is seen between total deposit and investment, implying that rising total deposit tends to be associated with higher microfinance bank and investment since such deposits provides them with a repository of funds to carry out meaningful and profitable investment.

Investment, and total deposit are highly correlated hence the 1.12 value of the DW-statistic in the OLS regression result.

Table 4.2 Correlation Results

	MFBLA	LQR	LR	CSR	TDP	INV
	1,0000	-0.0448	-0.2708	0.04663	0.9916	0.7390
LQR	-0.0448	1.0000	0.1451	-0.4848	0.0105	0.2376
LR	-0.270	0.145	1.0000	0.0590	-0.2889	-0.3942
CSR	0.0466	-0.485	0.0589	1.0000	0.0405	-0.4218
TDP	0.992	0.0104	-0.2889	0.0405	1.0000	0.7561
INV	0.739	0.238	-0.394	-0.422	0.7560	1.0000

Source: Data Computation using Eview 8.0

Unit Root Analysis

A time series is stated as non –stationary if mean and variance of the time series is dependent over time. On the other hand, a time series is stated as stationary if the mean and variance is constant over time. According to **Gordon (1995**), most economic time series are non-stationary and only achieved stationary at the first difference level or at a higher level.

Generally, unit root test involves the test of stationarity for variables used in regression analysis. The importance of stationarity of time series used in regression borders on the fact that a non-stationary time series is not possible to generalize to other time periods apart from the present. This makes forecasting based on such time series to be of little practical value. Moreover, regression of a non-stationary time series on another non-

stationary time series may produce spurious result.

The Augmented Dickey Fuller (ADF) test is employed in order to analyze unit roots in this study. The results are presented in levels and first difference. The enables us determining, comparative terms, the unit root among the time series and also to obtain more robust results. Table 4.3 presents results of ADF test in levels without taking into consideration the trend in variables. The reason for this is that an explicit test of the trending pattern of the time series has not been carried out.

In the result, the ADF test statistic for each of the variables is shown in the second column, while the 95 percent critical ADF value is shown in the third column. The result indicates that all the variables (except lending rate) possess ADF values that are less than the 95 percent critical ADF value (in absolute value). The implication of this is that the time series are non-stationary in their levels. In order words, the variables are time-dependent and would not guarantee a long run relationship unless tested.

Table 4.3 Unit Root Test for Variables in Levels

Variable	ADF Test Statistic	95% Critical ADF Value	Remark
MFBLA	1.1334	-3.0522	Non-Stationary
LQR	-2.8476	-2.9850	Non-Stationary
LR	-4.0937	-2.9850	Stationary
CSR	-1.1240	-2.9850	Non-stationary
TDP	0.77625	-3.0522	Non-stationary
TDP	-1.2698	-3.0522	Non-stationary

Source: Data Computation using Eview 8.0

Box and Jenkins (1976) have argued that non stationary time series in levels may be made stationary by taking their first differences. A given series is said to be integrated of order d (denoted I(d)) if it attains stationarity after differencing d times. If the series is I(1) it is deemed to have a unit root. This situation arises if the first difference of the series is I(0). We take the first difference of the respective variable and perform the unit root test on each of the resultant time series.

The result of the unit root test on these variables in first differences is reported in table 4.4 below. From the result, it is seen that the ADF test statistic for each of the variables is greater than the 95 percent critical ADF values (in absolute values). With these result, these variables are adjudged to be stationary. This implies that the variables that were initially non-stationary are actually difference-stationary, attaining stationarity after the first differences of the variables. Thus, we would accept the hypothesis that the variables possess unit roots. Indeed, the variables are integrated of order one (i.e. I(1).

Table 4.4 Unit Root Test for Variables in First Difference

Variable	ADF Test Statistic	95% Critical ADF Value	Remark
MFBLA	-3.6562	-3.0660	Stationary
LQR	-5.3849	-2.9907	Stationary
INV	-8.8231	-2.9907	Stationary

LR	-3.4925	-2.9907	Stationary
CSR	-4.0201	-3.0660	Stationary
TDP	-2.9336	-2.7221	Stationary

Source: Data Computation using Eview 8.0

Cointegration Test

Having established that the series in the analysis are not stationary in their levels, we move on to determine if they are cointegrated. This cointegartion test is based on the argument that "given that time series have unit roots, a long run relationship exists between a linear combination of such series. Due to the nature of this study, the Engle and Granger (1987) two-stage method is employed in the cointegration test. The result of the Engle and Granger cointegartion test is reported in table 4.5 below. In the table, the ADF test statistic value (-2.4746) is greater than the 95 percent critical ADF value of -2.4485 (in absolute value). This clearly indicates that the residuals are stationary. Indeed, there is cointegration between microfinance bank lending and the selected variables in the model. Thus, we conclude that there is a long run equilibrium relationship between microfinance bank lending and its various hypothesized determinants and, as such, the variables may converge in the long-run.

Table 4.5: Results of Engle and Granger Residual-Based Cointegration Test

Model	ADF Test Statistic	95% Critical ADF Value	Remark
1	-2.4746	-2.4485	Stationary

Error Correction Model (ECM)

To correct the long-run or equilibrium relationships for disequilibrium, we employ the error correction mechanism (ECM) initiated by Sargon (1984) and popularized by Engle and Granger (1987). Since the relationships between the dependent and independent variables are co-integrated, we proceed to express them as error correction mechanism (ECM) in accordance with Granger representation theorem to indicate the temporary behaviour of the dependent variable given short-run changes in the independent variables.

In the analysis, the estimated parsimonious ECM, has an ECM value (-0.5282) meets statistical criteria (that is negative and lies between 0 and 1 and statistically significant at the 5% level of significance). The absolute value of (0.53) of the ECM (-1) parameter indicates that equilibrium state is quickly restored at the rate of 53% given any temporary shock in long-run relationship. Given that the ECM model has strong predictive power and because of Durbin Watson statistics of 2.22 indicates the absence of autocorrelation in the time series data. We conclude that the results of the regression analyses and the coefficients of the models could be useful for policy direction.

The results are contained on table 4.6 below. An examination of the empirical results shows impressive goodness of fit statistic. Given the R-squared value of 0.99 and its adjusted counterpart of 0.97, it can be concluded over 97 percent of the net systematic variations in microfinance bank credits in the short run is explained by the combined explanatory variables. Thus, the overall predictive power of the model is impressive. The overall significance of the model including the reliability of the explanatory power of the

short run dynamic model is further confirmed by the F-value of 55.32, which is highly significant at the 1 percent level. Thus, we cannot reject the hypothesis of a significant linear relationship between microfinance bank credits and all the independent variables combined in the short run. The DW statistic of 2.00 shows the absence of serial correlation in the model, thus making the estimated model reliable and fit for policy perspective.

A close examination of the estimated coefficients for each of the explanatory variables reveals that current liquidity ratio, total deposit (current and lagged), one lagged investment, lending rate, current and one lagged cash reserve ratio all posses the required expected signs, while that of one lagged microfinance bank lending, one lagged liquidity ration and current investment has the expected signs. In terms of the statistical significance of the respective individual coefficients of the explanatory variables, it is observe that only that of current deposit of microfinance banks and one lagged investment are statistically significant. The coefficient of current deposit (1.0795) has a t-value of 6.3037, which is highly significant at the one percent level, and that of one lagged investment as t-value of 2.6391, which passes the significance test at the 5 percent level. The implication of this is that short term movement in microfinance bank lending is influenced by their level of total deposit and previous investment level. This invariably justifies the theoretical assertion that the more the total deposit (pool of deposited funds), and investment, the greater the ability of financial institutions to grant credit facilities to the real sector as exemplified in the financial intermediation theory. The high level of significance of total deposit in particular, implies that the ability of microfinance bank to grant credit facilities is mainly induce by the extent to which there is available pool of deposited funds from which lending can be given out to borrowers of funds. Their respective coefficients of 1.08 and 12.27 are greater than one respectively and both further buttresses this fact. The coefficient of current deposit of 1.08 implies that a unit increase in total deposit will raise microfinance bank lending by 1.08, while a unit change in previous investment will induce greater ability of microfinance bank to lend to the real sector by 12.3. Lending rate, cash reserve ratio and liquidity ration fail the significance test at the 5 percent level. This implies that rising lending rate tends to diminish the ability of microfinance banks to grant credit facilities. This is because rising lending rate (interest rate) implies exorbitant cost of loanable funds, which tends to discourage real sector borrowers. Thus, high lending rate has a destabilizing effect on the ability of microfinance banks to grant loans to the real sector. Its elasticity coefficient indicates that a unit rise in lending rate will decrease credit facilities by 0.60. The coefficient of cash reserves ratio has the correct hypothesized negative sign, though it fails the significance test at the 5 percent level. Current liquidity ratio (though positive) is not significant at the 5 percent level. And that of lending rate (though negative) is also not significant at the traditional level of significance and this suggests that they do not seem to have significant influencing role in the determination of microfinance bank lending in Nigeria.

Table 4.6 Parsimonious Error Correction Model (ECM): Dependent Variable is AMBLEND

Variable	Coefficient	T-Ratio	Prob
C	9555.8	1.3914	0.20

MFBLA	-3.369	-2.1996	0.05
LQR	107.86	1.3462	0.22
LQRI	-108.61	-1.8235	0.11
LR	-385.27	-1.1911	0.27
CSR	-606.79	-0.5587	0.59
CSRI	-1404.6	-1.1211	0.30
ATDP	1.0795	6.3037	0.00
ATDPI	1.5811	1.6960	0.13
AINV	2.8983	1.2791	0.24
AINVESTI	12.2740	2.6391	0.03
ECM(-1)	-0.5282	-2.514	0.03
R-Squared =0.99 Adjusted R-Squared=0.97	F-Value=55.32	DW Stat=2.00	

Source: Data Computation using Eview

The Long Run Analysis

Having analyzed the empirical results of the short-run dynamic model, we proceed to analyze the long-run equilibrium relationship among the variables. The estimated result of the long-run model is presented in table 4.7 below. An examination of the empirical results shows impressive goodness of fit statistic. Given the R-Squared value of 0.96 and its adjusted R-Squared of 0.94, it can be concluded that over 94 percent of the net systematic variations in microfinance bank credits in the long run is explained by the combined explanatory variables. Thus, the overall predictive power of the model is impressive. The overall significance of the model including the reliability of the explanatory power of the long run dynamic model is further confirmed by the F-value of 58.94 which is highly significant linear relationship between microfinance bank credits and all the independent variables combined in the long run.

An examination of the long run empirical results shows that the estimated coefficient for each of the explanatory variables reveals that investment possess the required expected signs, while liquidity ratio, lending rate and cash reserve and total deposit are not statistically significant at5%,thus, in the long-run, the most important factor that can influence microfinance bank lending is the level of investment. And this is in conformity with the theoretical assertion that the more the investment, the greater the ability of financial institutions to grant more loan in the long run.

Table 4.6: the Long-run Estimated Results

Variable	Coefficient	T-Ratio	Prob
C	4.832625	2.637039	0.0205
LQR	0.014139	1.870704	0.0841
LR	-0.000544	-1.390442	0.1877
CSR	0.197508	4.165160	0.0011
TDP	-0.009751	-3.301043	0.0057
INV	7.718906	0.268398	0.7926
R-Squared = 0.72 Adjusted	F-Value = 6.92	DW Stat = 1.97	

R-Squared = 0.62			

Source: Data Computation using Eview 8.0

Summary of Findings

Arising from data analyses, the findings of the study are:

1. Investment has a positive and significant impact on micro-finance bank lending in both the short and long-runs. This means that investment contributes and ensures the consistent lending ability of the bank.
2. The current total deposit has a positive and significant impact on microfinance bank lending in the short-run, while total deposit has positive and not statistically significant impact on microfinance bank lending. This means that the greater the level of deposits in microfinance bank, the greater their ability to lend to the real sector of the economy in the short-run.
3. Liquidity ratio has a positive and not statistically significant impact on microfinance bank lending in Nigeria in the short-run, while the impact of liquidity ratio is negative and not statistically significant in the long-run.
4. That lending rate has a negative and not statistically significant impact on microfinance bank lending in the short-run, while the lending rate has a positive and not statistically significant impact on microfinance bank lending in the long-run. Thus, the higher the cost of loanable funds, the lower the ability of microfinance bank to grant credit facilities to the real sector, though the impact is weak with the interplay of other important determining factors.
5. Cash reserve ratio (current and previous) has a negative and not significant impact on microfinance bank lending in the short-run, although cash reserve ratio impact on microfinance bank lending in the long-run is positive and not statistically significant. This is as a result of the negative effect of reserve requirement on the ability of microfinance bank to extend credit facilities.

5. CONCLUSION

In conclusion, these results strongly suggest that investment and total deposits are more potent instruments of micro finance bank lending and had a strong positive impact on micro-finance bank performance in the short-run periods in Nigeria within the period of 1990-2019. Furthermore, the results also suggest that the lending rate does not have long-run impact on microfinance bank lending.

Based on the empirical findings of this study, the following recommendations are offered:

1. Microfinance institutions should increase their investments in order to increase the size of their credit portfolio. This will give them more repository resources from which they can lend to the real sector of the economy which contribute to the overall economy.
2. Increased credit channeling from the microfinance institutions to the real sector of the economy should be encouraged through sectoral policies that will enhance the growth of the economy in Nigeria.
3. Sound monetary policies relating to liquidity management, reserve requirements and lending should be put in place by the monetary authorities so as to enhance the lending activities of microfinance banks to the real sector.
4. Regulatory authorities need to take critical regulatory and supervisory steps, through the ongoing financial sector reforms to put the operation of the microfinance institutions in better perspective that will enhance their

activities and overall economic growth in Nigeria.

5. Since the ability of microfinance banks to grant credit facilities depends on the extent of deposit they are able to mobilize from the public, sound deposit enhancement strategies are required to enhance their intermediation function. These include microfinance awareness programme and other financial inclusion strategies to reach the larger populace

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