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PROFITABILITY AND FINANCIAL SUSTAINABILITY OF MICROFINANCE BANKS IN NIGERIA

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ABSTRACT

This study seeks to evaluate the profitability of microfinance banks operating in Nigeria as a precondition of financial sustainability. Profitable banks tend to maintain adequate capital, high deposit base, high liquidity status and high loan quality. Correlational research design was adopted for the study and balanced panel data was used. Financial sustainability microfinance banks were profiled on size, capital adequacy and liquidity status, deposit base and loan quality following a balanced panel design. Multiple regression was used to analyze the data collected. The study reveals low level of profitability and sustainability, and hence recommends that Government and Monetary authorities (CBN) should increase the capital requirements for the establishment of Microfinance Banks as the current requirements are inadequate; embark on effective monitoring of the activities of Microfinance Banks; and promulgate policies that will

enhance transparency, proper accountability and competition in the sector to attract more credible investors.

Keywords: Microfinance, Sustainability, Capital Adequacy, Microcredit, Bank sustainability, Bank profitability, Nigeria

1.0 INTRODUCTION

Exclusion of the poor and down trodden from the formal financial services was discovered to be a major obstacle that prevented break from the grip of poverty. Poverty anywhere is potential poverty everywhere, as its ripple effects can impede growth of the economy. Financial inclusiveness was identified to be a means by which the poor and less privileged can access funds, and other services that the financial sector offers, with a dual aim to reduce poverty and also improve in growth of the economy. Notwithstanding fact that the financially excluded were over 56% of the economically active population, the private sector in the financial system was reluctant in accessing funds to the poor because of associated costs incurred, and/or risks of default that characterized loans to the poor. The Nigeria Government introduced a micro finance institution as a unit to enhance financial inclusiveness of, and cater for the financial needs of the poor. As plausible as it was, high cost of operation associated with small loans, made it difficult

for these entities to break even, hence had to relied on the government for operational grants, but the high demand on decreasing income accruing to the State imposed a restriction on ability to continue to fund the scheme. Sustainability of the micro finance scheme therefore depends on it being self sustaining by means of making enough profit that can guarantee survival of the scheme.

In 2005, microfinance banks came into the picture in Nigeria,. They receive "intervention fund" at nine percent from the government and disburse to microentrepreneurs at fifteen percent, leaving a profit margin of six percent. The government requires them to place less emphasis on collaterals but to ease off credit risk, the Nigerian Central Bank (CBN) mandates them to provide and obtain credit information on any prospective client from a credit reference bureau. In addition, their operations are insured by the Nigerian Deposit Insurance Corporation. Though, prior to 2005, microfinance banks were not within the supervisory purview of the CBN. They were known by various names: moneylenders, savings collectors, credit unions, co-operative societies, and the like. However, when the CBN realized that their operations hinder monetary stability, they were institutionalized into mainstream banking. Three categories of microfinance banks were created: Unit microfinance banks, which are restricted to a single community or local government, State microfinance banks, which are authorized to operate in all parts of a state and National microfinance banks, which can operate in several states.

The clients of these microfinance banks are artisans, petty traders, commercial motorcyclists, taxicab drivers, and a host of other petty business owners. They mobilize savings from these microentrepreneurs by means of daily contribution. In addition, they purchase business assets and sell them to the microentrepreneurs on hire purchase. Nevertheless, microfinance banks in the

country have been unable to attract significant savings from microentrepreneurs (CBN, 2011). Furthermore, state governments do not patronize microfinance banks; in Lagos State, for example, microcredit is disbursed directly to owners of small and medium scale enterprise, who must be guaranteed by top civil servants. In many developed countries, operations of microfinance banks are mostly funded by donations, which is also becoming less reliable. The management of microfinance banks are now shifting emphasis to self-funded operations. The mission of Inclusiveness of the poorest of the poor in formal financial system is a burden that micro finance institutions can hardly shoulder.

This study reports on the financial profitability of microfinance banks operating in Nigeria. Nigeria provides a realistic research setting for the study because the country's microfinance banks are profit oriented. They operate on commercial basis, lending to micro entrepreneurs based on character and cash flow. If the results indicate poor sustainability, then the government and donor institutions would be advised to seek alternative credible disbursement framework to provide financial services to microentrepreneurs. On the other hand, if the results indicate profitability, then the study provides evidence to counter the argument in the literature that sufficient level of profit is unattainable by profit-oriented microfinance banks.

The CBN observed that microfinance banks are unable to attract commercial capital and that they are unable to mobilize significant amount of savings (CBN, 2011). Moreover, states governments have failed to patronize microfinance banks as they deal directly with owners of small and medium scale enterprises. If these observations are correct, then it ought to be detected whether microfinance banks are profitable. The purpose is to provide information on sustainability of profit-oriented microfinance banks to regulatory authorities. As Paolucci noted, "profitability is a necessary and sufficient condition for sustainability" (Paolucci, 2016).

The study evaluates the profitability of microfinance banks operating in Nigeria as a precondition of sustainability. Profitable banks tend to maintain adequate capital, high deposit base, and high loan quality (Paolucci, 2016). Furthermore, the CBN restricts the operations of microfinance banks to communities, intrastate and interstates. Based on these observations, the study defined the following specific objectives to guide the design of the study:

1. To determine the influence of size of microfinance bank on profitability of microfinance banks in Nigeria.
2. To ascertain the influence of capital adequacy of microfinance bank on profitability of microfinance banks in Nigeria.
3. To examine the influence of deposit base on profitability of microfinance banks in Nigeria.
4. To evaluate the influence of loans' quality on profitability of microfinance banks in Nigeria.
5. To determine the influence of liquidity status of a microfinance banks on profitability of Microfinance banks in Nigeria.

This paper consists of six sections namely the introduction, literature review, methodology, data presentation and analysis, discussion of findings and conclusions and recommendations.

2.0 LITERATURE REVIEW

This section dwells on the conceptual review of key variables of the study and subsequently the theoretical framework to explain the influence of profitability on the financial sustainability of microfinance banks in Nigeria.

Concept of Microfinance

Microfinance can be seen as institutions developed to make available small-scale financial services specifically to unbanked and low-income individual, that is, "a broad range of financial services such as deposits, loans, payments services, money transfers and insurance, to the poor and low-income households and their farm or non-farm micro-enterprises" (Mwenda and Muuka, 2004). This definition is in consistent with the definition by propounded by the Asian Development Bank (ADB), which posit that microfinance deals with making the availability of a wide range of specifically financial services such as money transfers, payment services, insurance services, loans and deposits to low income and poor people and microbusinesses.

Based on the aforementioned definitions, it can be said that microfinance is created to provide more than just microcredit or small loans but to make available different types of financial services to low-income people and small-scale businesses. Therefore, the purpose of this study, and in agreement with these definitions, microfinance is referred to as a means to provide deposits, savings, microcredit (small loans) and also make available other financial services to the low income, the poor and microenterprises.

Concept of Sustainability of Microfinance

Sustainability according to Navajas et al (2000) is generally seen as permanence, also, Schreiner (1998) defines it as the ability to be consistent in performance over time. Sustainability allows a microfinance institution or provider to sustain its operations of providing financial services to those in need. This is largely dependable on the sustainability of the institutions themselves, their market and their legal policy and their consistency on the impact the have on their target consumers. The definition accorded sustainability in this study is a limited one. "Sustainability" implies a means to maintain an existing structure. The identification of such means and the continuous provision for such means is sustainability. Financial sustainability is the key to organizational survival. Finance requires maintaining the continuous existence of an organization's programmes.

There are several dimensions in which the Sustainability of microfinance institutions depending on the requirement of the users. These are: financial sustainability, human resource sustainability, mission sustainability and programme sustainability. Programme sustainability refers to the situation where customers (clients) have the perception that the services available to them are valuable and sufficiently important and they are willingly ready to take ownership and

responsibility of them. The mission sustainability can be seen as its sustainability in its mission. In the long-term mission sustainability will keep the microfinance in its chosen path. Human resource sustainability is when there is an availability of well-qualified manpower capable of support and delivering the financial services as needed to meet the microfinance institution's mission (Mahajan and Nagasri (1999).

In this study, the financial sustainability dimension of microfinance institutions is adopted. Financial sustainability can be defined as the scenario in which the microfinance institutions have the operations capacity to generate income that is capable to cover all its costs (costs incurred for current operations and growth support) (Thapa et al, 1992) without any dependance on external support like subsidies. Financial sustainability is also seen by Dunford (2003) as the ability of the microfinance to continuously move towards its objective on its own. These definitions focused on, the ability of the MFI to be self-dependent operationally and also the possibility of profit from its operations. Moreover, Financial sustainability is defined as the "ability of a microfinance provider to cover all of its costs. Achieving financial sustainability means reducing transaction costs, offering better products and services that meet client needs, and finding new ways to reach the unbankable poor" (CGAP, 2004:1). Financial self-sufficiency and operational sustainability are the two stages that financial sustainability can be measured.

Determinants of Profitability and sustainability of Microfinance Banks

The structural hypothesis that guided the design of this study is that microfinance institutions that are operationally self-sufficient and profitable tend to be large and sufficiently liquid to fund daily operations, have high deposit base but with adequate capital to checkmate deposit run-off, and carry quality loans. There are five operational hypotheses subsumed in this structural hypothesis.

1. Size of Microfinance Bank: First, the structural hypothesis suggests a positive relationship between the size of a microfinance bank and profitability, which is a precondition of sustainability. There are two dimensions to size of a bank. The first dimension is to discuss size in terms of areas of operation. In this regard, the number of branches becomes a valid measure of size. Unit microfinance banks operate within a local government area, and hence are the smallest; state microfinance banks operate in any part of a state, and thus should have more branches, and by implication, larger. There are also national microfinance banks that operate in more than one state. It is expected that these should have more branches scattered all over a country, and hence should be the largest. A positive relationship exists between the number of branches and assets value because as the number of branches increases, monetary value of assets increases. Thus, size surrogated by assets value. A concomitant observation is that as the number of branches increases, the number of employees also increases, suggesting that size surrogated by size of the labour force.

The second dimension of size is the number of products or services offered by a bank. In this view, the focus is on diversification, not number of branches per se. A positive relationship exist between number of products or services and revenue. In order words, the more the number of products or services offered to the public, the more revenue generated; thus, size surrogated by revenue. With

respect to microfinance institutions, this surrogate may not be valid because, on the average, a narrow range of financial services is available to the poor. In this study, therefore, size of microfinance banks surrogated by the total assets value of microfinance banks.

Larger banks have market power because they serve a larger number of customers (scope economies); thus, they should record a high profit figure (Paolucci, 2016; Saeed, 2014; Dogan, 2013; Alp et al, 2010). Large banks have access to markets in which small banks cannot enter (Paolucci, 2016), e.g. large microfinance banks may create products or services that meet the needs of owners of small and medium scale businesses. Thus, larger microfinance banks are in a better position to fund operations than their smaller counterpart is. These facts lead to the first operational hypothesis of the study:

Operational hypothesis 1: *Size of a microfinance bank has a significant influence on profitability of Microfinance banks.*

2. Capital Adequacy: Secondly, the structural hypothesis suggests a positive relationship between capital adequacy and sustainability. Bank capital refers to equity capital, and serves as a cushion against deposit runoff as well as forms the basis for future growth. Thus, a bank requires adequate capital to protect depositors against any loss that may result from poor management. A major determinant of a bank's capital adequacy is the capital-deposit ratio. The level of this ratio depends on the quality of assets. If a bank holds relatively safe and liquid interest bearing assets such as treasury bills or certificates, the capital-deposit ratio can be low. A bank ought to structure its assets portfolio in such a manner that liquid assets are adequate to checkmate deposit run-off. The deposit run-off ratio (i.e. liquid assets to total deposits) measures the number of times the liquid assets of a bank can cover the bank's deposits. A bank with a low ratio is likely to resort to inter-bank borrowing, with its attendant high interest costs, to withstand excessive deposit withdrawals. Thus, the lower the deposit-run off ratio, the lower the profitability of a bank, vice versa, and by implication, a high capital-deposit ratio will douse a low deposit run-off ratio, and hence a positive relationship between the capital ratio and bank profitability. However, risk-return hypothesis holds that less risky investments are less profitable. A high capital-deposit ratio indicates low advantage and hence low risk, suggesting that the bank management manages its portfolio to minimize risk, and this suggests lower profitability. Nevertheless, studies that use the capital-deposit ratio as an explanatory variable of profitability observe a positive relationship (e.g. Vong and Chan, 2009; Sufian and Chong, 2008). Another measure of a bank capital adequacy is the ratio of equity to total assets. A bank with a high ratio is considered adequate in terms of capital.

Effectively, such a bank can absorb losses in excess of loan-loss reserves provided in the period. The best performing banks are those that preserve a high level of equity relative to their assets (Obamuyi, 2013; Dietrich and Wanzenrid, 2009). In this study, both measures were used to assess the profitability of microfinance banks. Thus, the study hypothesized, operationally that:

Operational hypothesis 2: *Capital adequacy of a microfinance bank has a significant influence on profitability of Microfinance banks.*

3. Loan Quality: Third, the structural hypothesis suggests a positive relationship between the quality of loans in a portfolio of microfinance bank and sustainability. The quality of assets held in a bank's portfolio has been one of the indices used for assessing the earning capacity of a bank and its relative position. Loans and advances are the primary earning assets in a bank's portfolio. The issue is not the volume of loans but the quality of loans. The loan-loss ratio is a measure of the quality of loans and advances. A low ratio indicates high quality loans and advances, suggesting regular interest income, and hence a negative relationship should exist between a bank's loan-loss ratio and profitability (Paolucci, 2016). Thus:

Operational hypothesis 3: *Loan quality of a microfinance bank has a significant influence on profitability of Microfinance banks.*

Some authors document a positive relationship between the loan-loss ratio and a bank's profitability, suggesting that the more bad loans a bank has in its portfolio, the more regular or value of interest earned (Vong and Chan, 2009; Athanasoglou et al, 2008 ; Kosmidou et al, 2008). The supportive argument is based on management attitude towards risk. A risk-averse manager would provide less risky loans, that is, safe loans and advances, and this would tend to a low loan-loss ratio, but does this imply low interest income? Risky loans and advances attract higher interest rates, and hence more interest income, but when such risky loans and advances have become bad, the loan-loss ratio will be high, suggesting that high interest income has become less reliable, and hence less profitability. Thus, the statistical finding that a positive relationship exists between a bank's loan-loss ratio and profitability lacks a psychological explanation. Some authors calculate the loan-loss ratio by taking the total provision on classified loans and advances to total loan (e.g. Paolucci, 2016); however, for this study, only classified loans and advances fully written off to the income statement by means of a provision are consider loss. In the banking industry, a loan is classify to be non-performing based on the number of days interest is overdue. If interest has become overdue to the extent that the entire amount of loan is covered by provision, then such a loan should be considered a loss.

4. Liquidity: Fourth, the structural hypothesis suggests a positive relationship between a microfinance bank's ability to fund daily operations at a minimal cost and profitability. The liquidity ratio is an important index for gauging the ability of a bank to fund its daily operations at a minimal cost. Effectively, it measures the capacity of a bank to withstand heavy deposit withdrawals of customers, and to repay promptly all due short-term funds borrowed from other banks. Liquidity provides loans, and hence higher interest income or profitability, ceteris paribus. If liquidity ratio is high, a low loan-loss ratio is likely to result because interest is regular, and hence profitability is high. Also, studies that use liquidity to explain profitability observe a positive relationship (e.g. Paolucci, 2016; Sufian and Abibullah, 2008). Thus:

Operational hypothesis 4: *Liquidity status of a microfinance bank has a significant influence on profitability of Microfinance banks.*

However, there are also studies that observe a negative relationship between a bank's liquidity and profitability (e.g. Staikouras and Wood, 2004). Such a negative variation suggests that interest paid on deposits over-run interest from loan, or liquidity was not utilized to generate sufficient interest income.

5. Deposit base: Finally, the structural hypothesis suggests a positive relationship between a microfinance deposit base and profitability. The main source of a bank's funding is capital and deposits, which, for microfinance banks include government or donor intervention fund. The ratio of total deposits to capital tells us the proportion of deposits in a bank's capital. Deposits are the source of loans and advances, but banks reward depositors with interest. All things being equal, interest on loans should be higher than interest on deposits so that more loans suggest more income (Paolucci, 2016; Lee and Hsieh, 2014). Therefore, the higher this ratio, the more profitable will be the bank, provided deposits are loaned to earn interest income over reward on deposits. This led to the fifth operational hypothesis of the study.

Operational hypothesis 5: *Deposit base of a microfinance bank has a significant influence on profitability of Microfinance banks*.

Theoretical Framework

The Institutionist Approach of Microfinance Poverty Reduction Approach Theories is adopted to guide this study. Based on the review in the earlier section, MFIs are referred to as a vital institution for poverty through improving the availability of finance and other financial services which creates more income-generating opportunity and capacity, and increase the possibilities of the poor get to access all the requirements of development to reduce their vulnerability of unforeseen events and to be permanently alleviated from all dimensions of poverty. Thus, to this end, the best measure for the contribution of MFIs is through microfinance outreach. Their ability to reach economically active poor and the poorest. The two perspectives to which MFI should be given high consideration in the area of poverty alleviation are: The Welfarists approach (poverty lending approach and the institutionists approach (financial system approach) (Brau and Woller 2004). The Institutionists perspective has its main focus on financial sustainability of MFIs. They perceived financial deepening as the major objective of MFIs (Woller et al, 1999). They see financial deepening as providing sustainable financial intermediation for the poor. Furthermore, the Institutionists opine that financial self-sufficiency (profitability) should be the best measure of financial sustainability by all microfinance institutions (Brau and Woller, 2004). This assertion is based on the fact that dependance on donors is not certain in most cases, as such, microfinance institutions must be capable of financial self-sustainability or will not be able to achieve their long-term goals of serving the poor. On the other hand, on the contrary of promoting financial sustainability, a potential tension may lead a microfinance institution into mission drift (Aubert et al, 2009). The arguments presented by the Institutionists is a financing issue. The Institutionists would like to see the microfinance institutions have the operations capacity to generate income that is capable to cover all its costs without any dependance on external support and also the possibility of profit from its operations and attained sustainability.

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3.0 METHODOLOGY

This study employed correlational research design. This study is about financial sustainability of microfinance banks, using internal determinants (size and financial ratios). It investigates sustainability by looking at profitability across microfinance banks per year (a cross sectional data structure) rather than profitability of each microfinance bank over a time frame (time series data structure). It assumes a constant legal environment in that all microfinance banks within a country operate within the purview of the same regulatory authorities. However, it took into cognizance the facts that some microfinance banks are restricted to a community (unit microfinance banks), a state (state microfinance banks), and across states (national microfinance banks). Therefore, the results are expected to be generalized to profitability of microfinance banks operating in Nigeria There are nine hundred and seventy four registered microfinance banks in Nigeria of which eight hundred and sixty-seven are unit, ninety-eight are state, and seven are national microfinance banks. However, only microfinance banks with complete annual report and accounts in the Mix Market (www.mixmarket.com) were included in the sample. Table 1 depicts the sampling distribution.

Table 1: Sampling Distribution of Microfinance Banks in Nigeria

Types Registered	Included in Study's	Sample	Percentage
Unit Microfinance banks	867	112	13%
State Microfinance banks	98	32	32%
National Microfinance banks	7	7	100%
Total (*N*)	974	151	16%

Source: www.mixmarket.com

The microfinance banks included in the sample represent sixteen per cent of the total registered microfinance banks. However, this sample is representative of the entire population because the essential characteristic of the each segment of the population is duplicated (Avwokeni, 2016). According to Avwokeni, a heterogeneous population should be stratified into homogenous groups, and once this has been done, the sample size of each group is immaterial in as much as the characteristics of all members are represented in the sample. Data were secured from the annual report and accounts of microfinance banks that constitute the study's sample. A Shapiro-Wilk test was conducted at the conventional level (5 percent significance level) to ascertain whether a distribution is badly skewed or whether a distribution approximated the normal distribution. Ordinary least squares (OLS) method was followed to estimate the parameters of the fixed effect model. The transformed fixed effect was estimated for each measure of profitability (ROA, ROE) and operational self-sufficiency. Diagnostic statistical analyses were embarked upon to check on the assumptions of the OLS. Furthermore, tolerance was calculated and evaluated at a cut-off

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threshold of 0.10 to detect the presence of multicollinearity, and if present, variance inflation factor (VIF) was calculated and square rooted to detect the extent to which multicollinearity inflated the standard error, and hence the effect on t-test result of significance of regression coefficients. Durbin-Watson statistic was calculated to detect serial correlation.

Model Specification

A fixed effect multiple regression model was specified to guide analysis.

$$Л_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 CR_{it} + \beta_3 LR_{it} + \beta_4 DR_{it} + \beta_5 LL_{it} + \beta_6 D2020_i + \beta_7 D2021_i + V_{it} \ldots\ldots (1)$$

$$OSS_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 CR_{it} + \beta_3 LR_{it} + \beta_4 DR_{it} + \beta_5 LL_{it} + \beta_6 D2020_i + \beta_7 D2021_i + V_{it} \ldots\ldots (2)$$

A priori $\beta_1 \ldots \beta_5 > 0$

Where: Л is profitability (ROA and ROE); **OSS** is operational self-sufficiency**; SIZE**: surrogated by total assets; **CR**: capital ratio—a measure of capital adequacy; **LR**, liquidity ratio—a measure of liquidity status; **DR,** deposit base ratio; **LL,** loan-loss ratio—a measure of loan quality; **D,** intercept dummy for t = 2020 and 2021.

Measurement of Variables

Table 2 presents the research variables and the measurement procedure adopted to secure data into the design. The construct (latent factor) of this study is financial sustainability, and its indicator is profitability. According to Larson et al., 1999), profitability is the ability to provide financial rewards sufficient to attract and retain financing. This suggests that when owners find a business profitable, they will continue to provide the service. Thus, profitability is an indicator of financial sustainability. Prior studies in the field of microfinance also define sustainability from profitability point of view (see, for example, Collier, 2006; Brau and Woller, 2004 ; Meyer, 2002; Chaves and Gonzalez-Vega, 1996; Thapa et al, 1992). In other words, a microfinance bank is sustainable if and only if they are able to cover all their operating and financing costs from their own generated revenue, mainly through interest rate charges. Thus, this study employed related accounting measures of profitability to surrogate financial sustainability.

Table 2: Operationalization and Measurement

S/N	Construct	Surrogate	Measurement
1.	Size	Total assets	Log (Total Assets)
2.	Capital adequacy	Capital ratio	Equity capital ÷ deposit
3.	Liquidity status	Liquidity ratio	Gross loan portfolio ÷ Total deposits

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4.	Deposit base	Deposit base ratio	Total deposit ÷ total assets
5.	Quality assets	Loan-loss ratio	[Write offs –Value of loans recovered] ÷ Gross loan portfolio
6.	Sustainability	Operational self sufficiency	[Financial revenue] ÷ [Financial expenses + net impairment loss + operational expense]
7.	Profitability	ROCE	Operating profit after tax ÷ Total assets employed
8.	Profitability	Profit Margin	Net operating income ÷Financial revenue

4.0 PRESENTATION AND ANALYSIS OF DATA

The data secured for analysis are presented in this section. The required data were extracted from the annual report and accounts of each microfinance bank for 2017 −2021. In other words, each microfinance bank has three years data. In terms of size, the unit microfinance banks are smaller, followed by the state microfinance banks, and then the national microfinance banks. In the same vein, their assets base followed the same pattern. The fixed effect model was applied to estimate the panel regression model specified. We allowed different intercepts across time period to assess how the effect of loan-loss, liquidity status and operational self-sufficiency on profitability has changed over the period (see, for example, Wooldridge, 2009). It is usual to represent such constant attributes with a dummy time variable, and allow the error term to capture attributes that change over time. Thus, the multiple regression equation of the study allow for differing intercepts.

Table 3 reports the results of analyses on the profitability of national microfinance banks. Panel A presents the diagnostic statistics. The correlation matrix and the variance inflation factor (VIF) show that the deposit and capital ratios are highly correlated. This is expected because the deposit ratio (DR) is the reciprocal of the capital ratio (CR) when the value of equity capital is close to total assets. However, the results from analysis show that the regression equation has explanatory power for profitability; R^2 .7; F (7, 13) = 4.41, $p < .05$. Panel B reports the regression result when profitability was measured by return on total assets (ROA). Size, capital adequacy (measured by the capital ratio) and deposit base (measured by the deposit ratio) are positively related to profitability (measured by return on assets) while quality loan and liquidity status are negatively related to profitability. However, only liquidity status ($t = −2.58$, $p < .05$) and loan quality ($t = −4.58$, $p < .05$) significantly explained profitability. Panel C reports the results of the regression of return on capital on size, capital adequacy, liquidity status, loan quality and deposit base. The relationship between the determinants and return on assets also hold when profitability was measured by return on equity (ROE); however, only loan quality explains profitability ($t = −4.58$, $p < .05$). At Panel D, operational self-sufficiency (OSS) was regressed on the determinants of

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profitability on the thesis that "operational self-sufficiency" is a primary component of sustainability. As pointed out by Thapa *et al* (1992), operational self-sufficiency indicates the ability of Microfinance banks to cover cost with own self-generated revenue.

Table 3: National Microfinance Banks
Panel A: Collinearity diagnostics

	ROA	Size	CR	LR	DR	LL
ROA	1.0	.14	.46	−.40	.46	−.77
ROE	NA	.09	.46	−.40	.46	−.78
OSS	NA	.14	.54	−.52	.54	−.86
SIZE		1.0	.53	.45	.59	.20
CR			1.0	−.59	−.97	−.40
LR				1.0	.66	.55
DR					1.0	.43
LL						1.0
Tolerance		.5	.04	.40	.03	.61
VIF		2.0	28.6	2.5	36.0	1.7

***Panel B*: ROA_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	−2.36			
SIZE	+0.92	4.60	−0.20	.84
CR	+0.37	0.44	+0.84	.42
LR	−2.60	1.03	−3.27	.02
DR	+0.31	0.51	+0.61	.56
LL	−6.44	1.50	−4.28	.001

R^2 .54; R^2 .7;F(7,13)4.407, p.01; DW1.033

***Panel C* :ROE_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	−8.64			
SIZE	+.611	4.34	+0.14	.81

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CR	+0.35	0.42	+1.85	.41
LR	−1.55	1.05	−2.58	.02
DR	+0.28	0.49	+0.57	.58
LL	−0.65	1.42	−4.58	.001
	R^2 .6; R^2 .74;F(7,13)5.20, p.005; DW1.011			

***Panel D*:OSS_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	−17.24			
SIZE	+1.61	3.07	+0.52	.61
CR	+0.38	0.29	+1.31	.21
LR	−1.52	1.20	−3.16	.01
DR	+0.29	0.34	+0.83	.42
LL	−5.38	1.00	−5.35	.0005
	R^2 .72; R^2 .82; F(7,13)8.49, p.001; DW1.90			

Note: ROA, return on assets; ROE return on equity capital; OSS, operating self-sufficiency; CR, capitaldeposit ratio; LR, liquidity ratio; DR, deposit ratio; LL, loan-loss ratio; DW, Durbin-Watson statistic

Again, size of the microfinance banks, capital adequacy and deposit base are positively related to operational self-sufficiency, but liquidity status and loan quality are negative related. However, only liquidity status ($t = -3.16$, $p < .05$) and loan quality ($t = -5.35$, $p < .05$) explain operational self-sufficiency.

Table 4 reports the results of analyses on state microfinance banks. Panel A presents the result of the diagnostic statistics. The correlation matrix shows that size, capital adequacy, and deposit base are positively related to return on assets (ROA), return on equity (ROE) and even 0perational self-sufficiency (OSS) while liquidity status and loan quality are negatively correlated with all measure of profitability. However, an inspection of the tolerance and VIF shows that capital adequacy and deposit base are highly correlated, but the regression equations have explanatory power in all test cases. Panel B presents the regression results when profitability was measured by return on assets. Size, capital adequacy, and deposit base are positively related to return on assets, but not effective explanatory variables. Liquidity status and loan quality are negatively related to ROA and are the effective determinants (t_{LR} 3.27; p.05; t_{LL} 4.28, p.05). Panel C is the regression results when the measure of profitability is return on equity (ROE). Again, size, capital adequacy, and deposit base are positively related to return on equity while liquidity status and loan quality are negatively related to ROE. As with ROA, only liquidity status and loan quality are effective determinants of return on equity (t_{LR} 2.64; p.05; t_{LL} 4.69, p.05).

Table 4: State Microfinance Banks
Panel A: Collinearity diagnostics

	ROA	Size	CR	LR	DR	LL

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ROA	1.0	+.04	+.14	−.16	+.14	−.43
ROE	NA	+.03	+.16	−.14	+.16	−.42
OSS	NA	+.18	+.23	−.07	+.25	−.52
SIZE		1.0	−.06	.21	.02	−.01
CR			1.0	−.35	−.98	.12
LR				1.0	.36	−.04
DR					1.0	−12
LL						1.0
Tolerance		.92	.05	.83	.05	.97
VIF		1.1	21.1	1.2	21.4	1.03

Panel B: ROA_{it}

	β	**Std error**	**t -stat**	**p**
Constant	+41.84			
SIZE	+0.14	0.79	+0.17	.86
CR	+0.09	0.38	+0.23	.82
LR	−2.14	1.05	−2.59	.01
DR	+0.32	0.37	+0.86	.39
LL	−6.01	1.24	−4.84	.0005

R^2 .51; R^2 .69;F(7,88) 5.058, p.0005; DW1.536

Panel C: ROE_{it}

	β	**Std error**	**t -stat**	**p**
Constant	+27.57			
SIZE	+0.15	0.19	+0.19	.85
CR	+0.08	0.22	+0.22	.83
LR	−1.03	1.08	−2.64	.02
DR	+0.16	0.44	+0.44	.66
LL	−5.81	1.24	−4.69	.0005

R^2 .48; R^2 .52; F(7,88) 4.92, p.0005; DW1.432

Panel D:OSS_{it}

	β	**Std error**	**t -stat**	**p**
Constant	+26.85			
SIZE	+1.05	0.51	+2.08	.04
CR	+0.02	0.24	+0.09	.93
LR	−2.01	1.04	−2.13	.04
DR	+0.19	0.24	+0.81	.42
LL	−5.23	1.80	−6.54	.0005

R^2 .42; R^2 .5; F(7,88)9.02, p.0005; DW1.296

Note: ROA, return on assets; ROE return on equity capital; OSS, operating self-sufficiency; CR, capital deposit ratio; LR, liquidity ratio; DR, deposit ratio; LL, loan-loss ratio; DW, Durbin-Watson statistic

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Panel D presents the results when operational self-sufficiency is the dependent variable. Size, capital adequacy and deposit base are positively related to operational self-sufficiency but they failed to significantly explain it as the alpha level is less than .05. Liquidity status and loan quality are negatively related to operational self-sufficiency, and in addition, effectively explain it(t_{LR} 2.13; p.05; t_{LL} 6.54, p.05).

Table 5 presents the results of analyses of unit microfinance banks. Panel A presents the diagnostic statistics. The correlation coefficients in the correlation matrix show that size, capital adequacy and deposit base are positively related to return on total assets, return on equity capital and operational self-sufficiency, while liquidity status and loan quality are negatively related to all dependent variables. In addition, the correlation coefficients and VIF show that the capital adequacy and deposit base are highly correlated variables, suggesting that these two variables are performing the same explanatory function. However, in all dependent variables, the regression equations have explanatory powers. Panel B presents the regression results when the dependent variable is return on total assets. Size, capital adequacy, deposit base and liquidity status are positively related to return on total assets, while loan quality is negatively related. However, only liquidity status and loan quality are effective explanatory variables for return on total assets (t_{LR} 4.30; p.05; t_{LL} 4.93, p.05). Panel C presents the results when the dependent variable is return on equity capital. Here, liquidity status reverted to the usual negative behaviour. Size, capital adequacy and deposit base are positively associated with return on equity capital while liquidity status and loan quality are negatively associated with return on equity capital.

However, only the explanations offered by liquidity status and loan quality are significant (t_{LR} 4.30; p.05; t_{LL} 4.93, p.05). Panel D reports the regression results when the dependent variable is operational self-sufficiency. The usual behaviour of all determinants in relation to operational self-sufficiency is sustained. Size, capital adequacy, and deposit base are positively associated with operational self-sufficiency while liquidity status and loan quality are negatively associated with operational self-sufficiency. Again, only the liquidity status (liquidity ratio) and loan quality (loan-loss ratio) variables significantly impact on operational selfsufficiency (t_{LR} 4.33; p.05; t_{LL} 4.90, p.05).

Table 5: Unit Microfinance Banks
Panel A: Collinearity diagnostics

	ROA	SIZE	CR	LR	DR	LL
ROA	1.0	+.22	+.05	−.03	+.05	−.21
ROE	NA	+.18	+.05	−.02	+.06	−.26
OSS	NA	+.43	+.18	−.09	+.17	−.29
SIZE		1.0	+21	−.33	−.19	−.29
CR			1.0	+.075	−.92	+0.04
LR				1.0	−.10	−.62
DR					1.0	−0.1
LL						1.0

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Tolerance	.80	0.10	.57	0.10	.60
VIF	1.26	102.65	1.76	102.23	1.67

***Panel B*:ROA_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	+70.43			
SIZE	+1.39	0.79	+0.17	.86
CR	+.547	0.30	+0.23	.82
LR	+.13	1.03	+4.30	.0005
DR	+0.55	0.37	+1.50	.14
LL	−5.46	1.11	−4.93	.0005

R^2 .36; R^2 .42; F (7,328)7.789, p.0005; DW1.027

***Panel C*: ROE_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	+78.02			
SIZE	+0.82	0.90	+0.19	.85
CR	+.75	0.56	+0.22	.83
LR	−0.45	1.05	−4.32	.001
DR	+0.58	0.42	+1.56	.20
LL	−6.09	1.21	−4.90	.0005

R^2 .32; R^2 .48; F(7,328)7.810, p.0005; DW1.044

***Panel D*:OSS_{it}**

	β	**Std error**	***t* -stat**	***p***
Constant	+31.10			
SIZE	+2.42	0.32	+7.53	.0005
CR	+0.17	0.35	+0.49	.63
LR	−.10	.030	−3.51	.001
DR	+0.23	0.35	+0.65	.52
LL	−5.42	1.07	−5.08	.0005

R^2 .42; R^2 .51;F(7,328)16.85, p.0005; DW1.104

Note: ROA, return on assets; ROE return on equity capital; OSS, operating self-sufficiency; CR, capital deposit ratio; LR, liquidity ratio; DR, deposit ratio; LL, loan-loss ratio; DW, Durbin-Watson statistic

5.0 RESULTS AND DISCUSSION

The findings that size of a microfinance institution, influence profitability agrees with results of prior studies (Paolucci, 2016; Saeed, 2014; Dogan, 2013; Alp et al, 2010). On scope economies, large banks have access to markets in which small banks cannot enter, e.g. large microfinance banks may create products or services that meet the needs of owners of small and medium scale businesses. Thus, larger microfinance banks are in a better position to fund operations than their smaller counterpart is. Nevertheless, the test results failed to sustain this existing relationship. This may be due to homogeneity of products in the microfinance industry. Moreover, a microfinance bank may have a single branch in each state of the federation, but a state microfinance bank could

have several branches in a single state, and would tend to compete with national microfinance banks.

The results that the capital and deposit base ratios influence profitability agree with the findings of Vong and Chan (2009); Sufian and Chong (2008). The capital ratio is a measure of capital adequacy and deposit cover. Regulatory and supervisory authorities do not permit a bank's capital to fall below 10 per cent of total deposit liabilities. Thus, a capital ratio above 10 per cent contributes to sustainability. However, the level of this ratio depends on the quality of assets. If a bank holds relatively safe and liquid interest bearing assets such as treasury bills or certificates, the capital-deposit ratio can be low. A bank ought to structure its assets portfolio in such a manner that liquid assets are adequate to checkmate deposit run-off. The deposit run-off ratio (i.e. liquid assets to total deposits) measures the number of times the liquid assets of a bank can cover the bank's deposits. A bank with a low ratio is likely to resort to inter-bank borrowing, with its attendant high interest costs, to withstand excessive deposit withdrawals. Thus, the lower the deposit-run off ratio, the lower the profitability of a bank, vice versa, and by implication, a high capital-deposit ratio will douse a low deposit run-off ratio, and hence a positive relationship is expected between the capital ratio and bank profitability. Moreover, the main source of a bank's funding is capital and deposits, which for microfinance banks include government or donor intervention fund. The ratio of total deposits to capital tells us the proportion of deposits in a bank's capital. Deposits are the source of loans and advances, but banks reward depositors with interest. All things being equal, interest on loans should be higher than interest on deposits so that more loans suggest more income (Paolucci, 2016; Lee and Hsieh, 2014). Therefore, the higher this ratio, the more profitable will be the bank, provided deposits are loaned to earn interest income over reward on deposits. However, the test results failed to support this intuitive explanation. A possible explanation for this result is that the capital ratios of the microfinance banks were not very much higher than the 10 percent prescribed minimum. Microfinance banks manage this ratio to avoid scrutiny; under this scenario, the capital ratio could cease to be an effective driver of profitability, and hence sustainability.

The finding that a negative relationship exists between liquidity status and profitability or sustainability is at variant with the study's expectation. The study had hypothesized a positive relationship on grounds that the liquidity status of a financial institution is determined only when the statutory cash reserve requirements have been satisfied. Given the cash reserve ratio as a threshold of liquidity position, it is, expected that excess cash, measured by liquidity ratio, should explain profitability. This theorization agrees with Paolucci (2016) and Sufian and Abibullah, (2008). Liquidity provides loans, and hence higher interest income or profitability, ceteris paribus. If liquidity ratio is high, a low loan-loss ratio is likely to result because interest is regular, and hence profitability should be high. Nevertheless, the negative relationship also supported by prior research, e.g. Staikouras and Wood (2004). Such a negative variation suggests that interest paid on deposits over-run interest from loan, or liquidity was not utilize to generate sufficient interest income. This later theorization is a likely possibility because the Central Bank of Nigeria reported that microfinance banks were unable to attract deposits, and by implication, less loans. The negative relationship between loan quality and profitability or sustainability is in consonance with the study expectation and prior research findings (Paolucci, 2016). The argument being that quality

loans are safe or less risky, and hence attract lower rate of interest. Thus, lower profit expected from operational self-sufficiency, hence, long run sustainability. In contrast, risky loans and advances attract higher interest rates, and hence more interest income.

CONCLUSION AND RECOMMENDATIONS

This study was designed to provide evidence to substantiate or allay the fears of government of developed countries on mission and financial sustainability. The study was conducted on a setting where clients of market-oriented microfinance banks are the poorest of the poor. This requirement caters to mission sustainability. Some of the microfinance banks are restricted to a local government area (unit microfinance banks); some are allowed to operate in several places but within a state (state microfinance banks), and others have no geographical restriction (national microfinance banks). Then, the financial results of the microfinance banks were investigated for financial sustainability on the structural thesis that profitable banks tend to be large, have a portfolio of quality loan and maintain adequate capital against deposit run-off (Paolucci, 2016). A two-stage analysis was embarked upon for multiplicative corroborations. At the first stage, financial ratios were computed to profile capital adequacy, loan and liquidity statuses, and deposit base. At the second stage, the financial ratios were regressed against profitability, which was measured by return on assets, and return on equity, and sustainability, measured by operational self-sufficiency. The results from financial ratios and regression analyses were presented as evidence to conclude on profitability and financial sustainability. The study detects poorly sustained profitability over the three-year period (2017−2021). This result substantiates the concern of members of the global community such as international governments and the World Bank that microfinance institutions cannot fulfil mission sustainability if left alone to operate without donations or subsidies.

On the strength of the findings, it is recommended that Microfinance Banks in Nigeria have low or poor level of sustained profitability. It is recommended that the Central Bank Nigeria (CBN) and other monetary authorities should institute proper Monitoring and Evaluation Unit in-charge of the affairs of Microfinance Banks committed to identifying the weaknesses and strengths of the Banks, mitigating the weaknesses and, also consolidating on the strengths, making information on the sector readily available to investors. The Central Bank of Nigeria (CBN) should increase the capital requirement for the establishment of Microfinance Banks as the current is grossly inadequate. Government and Monetary authorities should promulgate policies that will enhance transparency, proper accountability and competition in the sector to attract investors that are more credible.

References

Alp, A., Ban, U., Demirgunes, K. and kilik, s. (2010), “Internal determinants of profitability in Turkish banking sector”, *Instanbul Stock Exchange Review*, 12(46), 1−46.

Athanasoglou, P.P., Brissimis, S.N. and Delis, M.D. (2008), "Bank-specific, industry-specific and macroeconomic determinants of bank profitability," *Journal of International Financial Markets, Institutions and Money*, 18(2), 121−136.

Aubert, C., Janvry, A., and Sadoulet, E. *"Designing Credit Agent Incentives to Prevent Mission Drift in Pro-poor Microfinance Institutions."*Journal of Development Economics, 90(1), 2009, pp. 153-162.

Avwokeni, Arthur J. (2016) *Basic Research Knowledge for Academics*, Lagos, University Campus Publishers, p. 304.

Brau J., and Woller G.(2004), "Microfinance: A Comprehensive Review of the Existing Literature*," Journal of Entrepreneurial Finance and Business Ventures*, 9(1), 2004.pp.1-26.

CBN, (2011), Microfinance Policy Framework for Nigeria. Available @ http://www.cbn.gov.ng/Out/2011/publications/dfd/Reviewed%20Microfinance%20Policy%20July%2012%202011Pdf

Central Bank of Nigeria Revised Regulatory and Supervisory Guidelines for Microfinance Banks in Nigeria; DRAFT: 18th December 2012

Chaves, R. A. and Gonzalez–Vega, C. (1996), *"The Design of Successful Rural Financial Intermediaries: Evidence from Indonesia,"* World Development, 24(1), 65−78.

Collier A. (2006), "Can micro-credit bring development?." *Journal of Development Economics*, Vol.86, No.1, pg. 1-21.

Collier P.(2006), "*Accounting for Managers: Interpreting Accounting Information for Decision–Making."* 2nd edn. England: John Wiley & Sons Ltd, 2006.

Dietrich, A. and Wanzenried, G. (2009), "Determinants of bank profitability before and during the crisis: evidence from Switzerland," *Journal of International Financial Markets, Institutions and Money*, 21(3), 205−327.

Dogan, M. (2013), "Does firm size affect the firm profitability? Evidence from Turkey", *Research Journal in Accounting and Finance,* 7(3), 63−75.

Dunford, C.(2003), *"The Holy Grail of Microfinance: Helping the Poor and Sustainable."*In: Harper, M. (ed.) Microfinance: Evolution, Achievements and Challenges. London: ITDG Publishing, 2003, pp. 150-154.

Kosmidou, K., Tanna, S. and Pasiouras, F. (2008), "Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002," *Economics, Finance and Accounting Applied Research*, Working paper, Series No. RP08-4), Coventry: Coventry University, pp. 1−27.

Larson, K. et al.(1999), "Fundamental Accounting Principles" (5th edition), Boston, Burr Ridge: Irwin McGraw-Hill,

Lee, C and Hsieh, M. (2014), "Bank Reforms, Foreign Ownership and Financial Stability", *Journal of International Money Sand Finance*, 40, 204−222.

Mahajan, V and G. Nagasri. (1999) *"Building Sustainable Microfinance Institutions in India: Factors that make microfinance institutions sustainable."* A paper written for seminar on New Development Finance, Frankfurt, September 1999.http://www.sadhan.net/Adls/Microfinance/PerspectiveMicrofinance/BuildingSustainableMFIs.pdf

Meyer, L. R. (2002), "*Track Record of Financial Institutions in Assisting the Poor in Asia,"*ADB Institute Research Paper, No. 49. Available at: http://www.esocialsciences.com/data/articles/Document113112009240.6883051.pdf (Accessed 18 August 2015)

Mwenda, K.K and Gerry N. Muuka.(2004), *"Towards best practices for finance institutions engagement in Africa rural areas: selected cases and agenda for action."*International Journal of Social Economics, vol. 31, 143-8.

Navajas Sergio, Mark Schreiner, Richard L. Meyer, Claudio Gonzalez-Vega and Jorge Rodriquez-Meza. (2000).*"Microfinance and the Poorest of the Poor: Theory and Evidence from Bolivia."*Forth coming in World Development, Vol. 28, 2000.http://gwbweb.wustl.edu/users/schreiner

Obamuyi, T.M. (2013), "Determinants of banks' profitability in a developing economy: evidence from Nigeria," *Organizations and Markets in Emerging Economies*, 4(2/8) 97−111.

Paolucci, M. (2016), "The determinants of bank profitability: empirical evidence from European banking sector", *Journal of Financial Reporting and Accounting*, 14(1). Available @ http://dx.doi.org/10.1108/JFRA−05−2015−0060(Accessed 5 May 2017).

Saeed, M. S. (2014), "Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom", *Research Journal of Finance and Accounting*, 5(2), 42−50.

Schreiner, M.J.(1998) *"A Framework for the Analysis of the Performance and Sustainability of Subsidized Microfinance Organizations with Application to Bancosol of Bolivia and Grameen Bank of Bangladesh."*Ph.D dissertation, The Ohio State University, 1998. http://www.microfinance.com/English/Papers/Dissertation_Complete.pdf

Staikouras, C. K. and Wood, G.E. (2004), "The Determinants of European Bank Profitability", *International Business and Economic Research Journal*, 3(6), 57−68.

Sufian, F. and Chong, R.R. (2008), "Determinants of bank profitability in a developing economy: empirical evidence from the Philippines," *Asian Academy of Management Journal of Accounting and Finance*, 6(3), 1−58.

Thapa, G. B., Chalmers, J., Taylor, K. W. and Conroy, J. (1992) Banking With the Poor: Report and Recommendations Based on Case Studies Prepared by Lending Asian Banks and Non-Governmental Organizations," FDC, Brisbane, Australia.

Vong, A.P.I. and Chan, H.S. (2009), "Determinants of bank Profitability in Macao," *Macau Monetary Research Bulletin*, No. 12, pp. 93−112.

Woller, C. Dunford, and W. Warner. *"Where to Microfinance."*International Journal of Economic Development, (1) 1999. Pp. 29–64.

Wooldridge, J.M.(2009). *Introductory Econometrics*, Mason, USA, South-Western, 2009, p. 456.