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WHAT FACTORS DRIVE THE MICROFINANCE BANKS' PROFITABILITY IN NIGERIA?

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KEYWORDS	ABSTRACT
Profitability, Liquidity, Non-Performing Loans, Gross Domestic Product, Exchange Rate <div style="background-color: #00aaff; color: white; padding: 2px;">Article History</div> Date of Submission: 10-02-2023 Date of Acceptance: 28-03-2023 Date of Publication: 31-03-2023	Banks' profitability is vital component of economic growth, its significance extends from' sustainability of banks to macroeconomic stabilization. Thus, this study assessed the effect of banks' specific factors and macroeconomic variables on the profitability of microfinance banks (MFBs) in Nigeria from 2012-2021. The purposive sampling technique was employed to select 15 licensed MFBs from the South West region of Nigeria. This study employed return on assets (ROA) as an indicator of profitability. Secondary data was elicited from annual published reports of the selected MFBs. Descriptive, regression and correlation techniques were used to analyse data. Findings revealed that MFBs age and size play major roles in the determination of the banks' profitability; non-performing loans substantially influenced MFBs profitability though adversely. Liquidity rate exerted negligible but positive influence on MFBs profitability. Furthermore, gross domestic product and exchange rate influenced MFBs profitability considerably. In contrast, the Inflation and Interest rate had an adverse but noticeable effect on banks' profitability. The results provide significant directions to banks as well as related policy-makers. Bank management should take cognizance of these salient factors and endeavor to the lower non-performing loans in order to enhance MFBs profitability.
	
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INTRODUCTION

There is a growing consensus among economists and policymakers that the microfinance banks (MFBs) are crucial for promoting the economic growth and achieving inclusive development in developing nations (Ademola, Kazeem & Ajayi 2022; Ochonogor, 2020; Akinadewo, Akinkoye & Olasanmi 2020). This is true as MFBs provide financial services to low-income individuals who lack access to financial services offered by traditional banks due to high transaction costs, high risk associated with providing the credit to them, and inadequate assets as credit collateral (Ademola, Adegboyegun, Kazeem & Akanbi, 2020). Alongside financial intermediation, several MFBs offer services that help groups connect and learn about financial management. Also, they

are major drivers in tackling twin issues of poverty and unemployment, which pose substantial risk to economic growth of emerging nations (Ademola, 2022). Their aim is to assist deprived in managing risk and taking advantage of small earnings prospects, by realizing profit-making banking trials in low-income neighborhoods. By easing financial restrictions, MFBs encourage small businesses from otherwise untapped market activity while producing the return on their investment. Despite the increasing popularity of MFBs and the numerous benefits they offer, MFBs profit has fluctuated over the years, as shown in their financial accounts, For instance, it was discovered that around 103 MFBs had shut down as of the December, 2021 (Ochonogor, 2020).

So, in order to offer guidelines on the worrisome state of affairs in the subsector, it is necessary to research and examine the causes of persistently upsetting circumstances in the microfinance subsector. Additionally, monitoring profitability of MFBs is crucial for ensuring their viability, boosting share capital, and maximizing dividend payments to shareholders (Nkegbe & Yazidu, 2015). Bank's profitability is an indicator of how well it fulfills its intermediary role and a way to assess its capacity to offer excellent service to the customers. Odusanya, Yinusa and Bamidele (2018) suggested that firms must embrace profit maximization as a major priority in order to maintain their competitiveness and sustainability. Profitability of MFBs is significant from the macroeconomic perspective and at individual level (Aremu & Mejabi, 2013). MFBs profitability may be driven by several factors, some relate to banks' management like the capital adequacy, solvency, liquidity, interest rates (Islam, Sarker, Rahman, Sultana & Prodhan, 2017; Öhman & Yazdanfar, 2018; Batten and Vo, 2019). Other factors may be inflationary trends, interest rates, exchange rates. Exploring the factors influencing MFB's profitability is crucial to maintaining the economic stability because the banking industry's health is essential to the well-being of the economy as a whole. Consequently, though, owing to the shortage of data, the profitability of MFBs, especially across the African economies, is hardly studied. But, why is MFBs profitability important?

Profitability is suitable mechanism for achieving MFBs long-term growth and competitiveness. Profitability is necessary for a productive microfinance sector at the micro level and is the most affordable source of the capital without which no company could obtain outside capital. If profits are retained, MFBs' profits are significant source of the equity and may help maintain economy. Still, only MFBs that have proven they can make profit can access market sources of finance. Exceptional gains are essential in guaranteeing MFBs stakeholders by reducing the likelihood of a financial disaster. At macro level, a successful MFB is well positioned to weather adverse shocks and make a significant contribution to the sustainability of the whole financial system. Many academics both inside and outside the country have become interested in the discussion about factors that determine commercial bank profitability (Kajola, Olabisi, Ajayi & Agbatogun 2018; Al-Homaidi et al 2018; Isayas 2022) The gap in the literature that has been identified is that, despite the vast number of empirical research on the factors that affect commercial banks' profitability, very few or none of them focused on MFBs in Nigeria on the same topic. This study focused on the Nigerian MFBs that were operational from 2012 to 2021 in order to solve the aforementioned limitations due to their nationwide coverage and data accessibility, this is one of few studies that focuses particularly on Nigerian MFBs profitability over such long period of time.

Correspondingly, it was discovered that many researchers concentrated on the impact of single variables like liquidity on bank profitability (Idowu, Essien & Adegboyega, 2017; Obaleye, 2018);

capital structure and profitability (Amare, 2021); inflation rates and profitability (Batayneh, Salamat & Momani, 2021); market share, profitability (Ifuero & Chijuka, 2014). Regrettably, many studies conducted at the country level ignored the effect of macroeconomic variables on MFBs profitability, all the studies conducted on the topic found the inconsistent results, which exacerbates the issue in Nigeria. As a result, this work will be crucial in filling the gap created by earlier research. Additionally, monitoring profitability of MFBs is crucial for ensuring their viability, boosting share capital, maximizing dividend payments to shareholders. In addition, it is anticipated that the majority of the recommendations made in this study will contribute to improving the performance of Nigeria's MFBs and advancing the nation's economic growth if they are put into practice. This study enabled us to reach important and valuable conclusions that will aid the government agents and the relevant authorities in evaluating the factors that are influencing MFBs profitability in Nigeria. The study will ultimately be used as a reference for other studies. This paper is divided into five sections: an introduction of the work, review of related literature, methodology, discussion of results, conclusions and policy implication of the study.

Research Questions

1. What is effect of banks' specific factors (age, size, non-performing loans & liquidity) on the profitability of MFBs in Nigeria?
2. Does macro-economic factors (gross domestic product, inflation, interest & exchange rates) affect MFBs profitability in Nigeria?

LITERATURE REVIEW

This subsection presents the literature review for this study, which is drawn from the prior research. It is divided into three areas which are the conceptual, theoretical and the empirical reviews.

Microfinance Banks in Nigeria

In recent years, MFBs have gained a reputation as fast-growing financial services industry that targets and aids poor and small businesses as alternative to restricting influences of traditional banks. It encompasses range of the financial services, including transfers of money, insurance, and savings to disadvantaged in society. Central Bank of Nigeria (2012) defined 'microfinance as provision of small-scale loans and savings to people who run farms, fisheries, herds, other businesses especially marginalized. As per MFBs prudential guidelines, these banks intend to accomplish the following goals:

- ✓ Enhancing socio-economic conditions of women, mainly those in remote communities
- ✓ Developing potentials for the wealth creation among the resourceful poor people
- ✓ Fostering sustainable livelihood by boosting rural responsive banking practices and
- ✓ Eradicating poverty by developing skills for generating income.

These goals are essential to enhancing the empowerment of marginalized as they are frequently denied their rights by conventional banks due to significant level of risk and expense attached to service provision.

Profitability of Microfinance Banks

Profitability is a target for firms and a good indicator of firms' effectiveness (Petria et al., 2015). The link between the firm's profits and investment activities that helped generate those profits

is known as profitability. The profitability is highly significant and accurate since it gives a true overview of firm's capacity to improve its income level. Firms' ability to generate profit controls its potential for growth. Profitability is determined either by using link between profits, sales or relationship between profits and the investments it facilitates (Kajola et al., 2018). Like other economic entities, MFBs prioritize making profit as one of their top priorities as it is imperative to its success and continued existence. It is regarded as the primary criterion for shareholders, depositors, lenders, management, regulatory agencies. Banks' management use profit as key metric to assess how well bank uses resources at its disposal. As of MFBs success and ability to increase its capital adequacy, regulatory authorities are paying attention to it (Kajola et al., 2018).

Determinants of Profitability

These can be categorised into internal and external determinants. The internal determinants are called firm-specific or micro determinants. It is challenging for the company to assess these factors on surface because they are deeply ingrained in the financial statements (the balance sheet and income statement) of the firm. Examples of internal determinants are liquidity, risk management, capital sufficiency, operational effectiveness, expense control, asset quality, and size. Firm has complete control over these variables. The external factors which impact directly/indirectly on firm performance are known as external determinants. These elements represent economic environment in which banks function. Due to firm inability to control these factors, they are known as macroeconomic determinants. Examples are inflation, interest & exchange rates.

Theoretical Framework

Signaling theory, which Spence propounded in 1974, defines behavior that conveys information to make firms appear appealing. The theory asserts that increasing capital signals to the market that the bank is valuable and this helps to clarify the link between capital and profitability. So, theoretically, bank management informs clients that things are improving by boosting capital, as stated by Berger (1995) and Trujillo-Ponce (2012). Thus, the reduced leverage demonstrates superior performance by banks than by their competitors, who are unable to raise the shares without further reducing profitability This theory is aimed at maximizing the firm's chances of obtaining market-based capital funding which is based on the confirmation that was provided after its financial records were published and presented in a manner that upholds the firm's reputation. This gives the impression that investors are confident in them and show no concern about danger involved in financing their operations. Additionally, the existence of significant incentives for profitable firms to disclose their reports heightens the pressures of competition Even firms with poor performances are required to report their activities since non-disclosure erodes investor confidence. Signaling theory supports idea that management of firms increase capital in order to convey conventional signals about promising future prospects (Kajola et al., 2018).

EMPIRICAL REVIEW

Researchers have studied variables affecting banks' profitability. For instance, Mutonga (2022) examined how macroeconomic factors affected bank profitability in Kenya and discovered that GDP significantly effects bank performance but interest rates and inflation have little bearing on it. Nguyen et al. (2021) also investigated the factors influencing Vietnam banks' profitability and discovered that size, equity, liquidity, and inflation significantly affected ROA and ROE.

[Kanella et al. \(2021\)](#) analysed the effect of internal and external factors on bank profitability in United Kingdom. Their research showed that profitability had negative relationship with bank size and that it was unrelated to GDP or liquidity. Using a GMM model, [Horobet et al. \(2021\)](#) investigated the variables influencing bank profitability in Central and Eastern Europe. Budget balance, inflation rate and non-government spending all had substantial negative effects. Yet credit, lending rates, capitalization rates, and concentration rates have noticeable impact upon profitability. Internal factors, according to [Koroleva et al. \(2021\)](#), have the significant positive impact on banks' profitability. In this connection, they claimed that since of their size, strong credit ratings, and superior liquidity, state-owned banks seem promising towards the desired outcomes.

In contrast, findings showed that GDP and inflation rate have little bearing upon profitability. [Ngweshemi and Isiksal \(2021\)](#) further claimed that banks' unique features offer true evaluation than macroeconomic variables that aren't within their control. [Lestaria et al. \(2021\)](#) asserted that bank size favorably impacted on profitability (ROE), while liquidity and leverage exhibited detrimental effect. [Islam and Bhuiyan \(2021\)](#) claimed that the profitability is positively impacted by bank size (BS), but negatively impacted by overhead expenses, liquidity and non-performing loan (NPL). [Do et al. \(2021\)](#) assessed variables influencing profitability of Vietnamese banks and revealed that GDP and inflation have considerable impact on bank profitability. They also discovered that profitability is significantly impacted by bank efficiency, liquidity, and credit risk. In Bangladesh, [Hosen \(2020\)](#) studied few banks and discovered that the profitability of the banks was highly impacted by interest rate, capital adequacy, liquidity. [Pham et al. \(2020\)](#) examined 10 Vietnamese banks. They discovered that profitability was positively impacted by state ownership, loan size, inflation rate, and operational performance. In this connection, the [Uralov \(2020\)](#) examined the factors affecting bank profitability in the Central European nations between 1996 and 2017 and initiate that GDP had a favorable impact upon the bank desired profitability.

[Syathiri et al. \(2020\)](#) asserted that banks size, the number of loans it produces, and quantity of money it lends out are all key factors determining banks' profitability. Furthermore, [Hasan et al. \(2020\)](#), revealed that factors, like bank's size, capital ratio, and liquidity impact substantially on bank's profitability. [Abdullahi \(2019\)](#) assessed the variables influencing the profitability of Nigerian banks and found that interest rates, bank size, and profitability all have favorable and significant associations, loans and profitability have unfavorable but significant relationships. They found poor correlation amid deposits & profitability of Nigerian banks. [Gwachha \(2019\)](#) focused on management cost effectiveness whilst studying macroeconomic and bank-specific factors affecting the performance of Nepalese banks. It was revealed that the loans portfolio severely reduces bank's profits. [Sanyaolu et al. \(2019\)](#) investigated specific and macroeconomic factors that affected the profitability of the 10-listed deposit money banks on the Nigerian Stock Exchange. Findings show that age has the considerable negative impact on profitability whereas capital sufficiency, nonperforming loans, loan to total assets, as well as size have significant favorable effects. They discovered that profitability was positively impacted by state ownership, loan size, inflation rate, and operational performance. Hitherto, the said study was unable to demonstrate meaningfully relationship between macroeconomic variables and banks required profitability.

[Iskandar et al. \(2019\)](#) discovered that the management efficiency, liquidity, and credit risk all influenced bank profitability in Malaysia. [Kajola et al. \(2018\)](#) focused on credit risk management

and profitability in Nigeria. The two proxies ROA and ROE were used to measure profitability, nonperforming loan to total loan ratio and capital adequacy ratio have the substantial positive influence on profitability as assessed by ROA, whereas the nonperforming loan to deposit ratio was found to have considerable negative effect on banks profitability. Yet credit, lending rates, capitalization rates, and concentration rates have a noticeable impact on profitability. Internal factors, according to [Koroleva et al. \(2021\)](#), have weighty positive effect on bank profitability. In this connection, [Sanyaolu et al. \(2019\)](#) investigated the specific and macroeconomic factors that affected the profitability of 10 listed deposit money banks on the Nigerian Stock Exchange. [Pham et al. \(2020\)](#) examined 10 Vietnamese banks. [Okere et al. \(2018\)](#) revealed that credit and liquidity risk have strong beneficial impact on the banks' profitability. Thus, despite the vast number of empirical studies on factors affecting commercial banks' profitability, none of them specifically focused on MFBs in Nigeria. This research addresses the gap left by these studies and also added to existing knowledge by investigating factors influencing MFBs profitability in Nigeria.

Hypotheses of Study

- 1HO: Banks specific factors do not significantly affect profitability of MFBs in Nigeria
- 2HO: The macro-economic factors have no effect on the MFBs' profitability in Nigeria

RESEARCH METHODOLOGY

The study utilized an ex-post facto design. This is because it is aimed at examining the factors affecting MFBs' profitability in Nigeria. Secondary data was gathered from the annual reports of selected banks in Nigeria from 2012 to 2021. The study's population consists of all licensed MFBs functioning in Nigeria as at December 31st, 2021. Thus, purposive sampling method was employed to select 15 MFBs from Oyo, Osun, Lagos, Ondo and Ogun states, in the South West region of Nigeria. Secondary data was elicited from annual published reports of selected MFBs. In this connection, the descriptive, regression and correlation techniques were used to analyse the data. The descriptive statistics and econometric tools which includes the mean, maximum, minimum, and standard deviations were employed to examine the data patterns. The model's fitness was thus assessed using the diagnostic tests like variance inflation factor, normality and Hausman tests.

Variable Measurement

Dependent Variable

Study used return on assets which is regarded as best and most popular metric of profitability. [Tan \(2016\)](#) asserted that ROA measures a bank's capacity to effectively manage its profits and expenditures and management's potential to profit from both its financial, physical assets. This ratio supports banks to understand capability to invest and use financial resources to make a profit.

Independent Variables

The explanatory variables that are theoretically related to the dependent variable were selected for this investigation. These are classified into two, bank specific factors which are liquidity, non-performing loans, bank size and age, then macroeconomic factors involving exchange rate, inflation rate, interest rate, and gross domestic product. The variable measurements are listed in Table 1.

Table 1*Measurements of Variables*

Variables	Abbrev.	Measurement
Profitability (ROA)	ROA	Net profit after tax / total asset
Bank age	AGE	Number of years bank operated
Liquidity	LQR	Ratio of cash, equivalent to total assets of bank
Non-performing loans ratio	NPLR	Ratio of Non-performing loans to gross loans
Bank size	BSZ	Natural log of total asset
Exchange rate	EXR	Annual average Naira against US Dollar
Inflation rate	INF	Annual average consumer price index
Interest rate	INR	Interest paid / Interest Earned
Gross Domestic Product	GDP	Total value of goods produced in country in year

Source: Author's computation, 2022

Model Specification

The literature has presented a number of models; this study adopted [Busari and Adeniyi \(2017\)](#) and modified it to fit the objectives of the research. Hereafter, the adapted model is defined as follows:

$$1. ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 LQR_{it} + \beta_3 AGE_{it} + \beta_4 BSZ_{it} + \epsilon_t \dots\dots (1)$$

Where; ROA = Return on Asset; NPL = Non-performing loan; LQR = Liquidity ratio; AGE = Bank Age; BSZ = Bank size; t = Time period; β_0 = denotes the regression constant. β_1 - β_4 = coefficients of variables to be evaluated

$$2. ROA_{it} = \alpha + \beta_1 INF_{it} + \beta_2 INR_{it} + \beta_3 EXR_{it} + GDP_{it} + \epsilon_t \dots\dots\dots (2)$$

Where: INF = Inflation rate ; INR = Interest rate; EXR = Exchange rate and t = Time period; β_0 = denotes regression constant. β_1 - β_4 = coefficients of variables to be evaluated.

RESULTS OF STUDY**Table 2***Summary of Descriptive Statistics*

	ROA	AGE	LQR	NPLR	LOG(BSZ)
Mean	0.135233	9.345127	0.322667	5.632210	10.75726
Maximum	0.388641	20.43211	0.486730	20.43876	12.65340
Minimum	0.031115	5.401200	0.101267	3.376511	8.52566
Std. Dev.	0.159024	10.54398	0.354121	6.128750	11.54321
Skewness	0.654663	0.225675	0.322215	0.475291	0.200009
Kurtosis	2.248180	2.124482	3.321750	1.680562	1.372806
Jarque Bera	1.876197	4.672348	4.445760	3.872552	3.564002
Prob.	0.352911	0.156490	0.242987	0.112364	0.184433
Obs.	150	150	150	150	150

Dependent Variable: Profitability (ROA)

AGE = Age; LQR = Liquidity; NPLR = Non-performing loan ratio; LOG (BSZ) = banks size

Source: Author's computation, 2022

The results of descriptive analysis is displayed in Table 2. It provides the summary of statistics including mean, median, standard deviation, and measures of the distribution's symmetry and normality. Analysis shows that ROA has an average value of 0.135 (13.5%), lowest value of 0.03, and highest value of 0.389. According to this, each Naira invested in the assets of banks yields, upon average, 13.5k. BSZ had a mean value of 10.75, a standard deviation of 11.54, and minimum and maximum values of 8.525 and 12.65, accordingly. Mean liquidity ratio is 0.322 with minimum and maximum values of 0.10 & 0.486. Results indicate that values of standard deviation are greater than average values; meaning that values are well dispersed and skewed. Also, skewness portends positive values ranging from -1 to +1, which is an indication that data are positively and normally skewed right. Also, kurtosis values are less than three. Jarque-Bera statistics are above 0.05 critical values. The findings showed that the variables have normally distribution.

Table 3
Variance Inflation Factor

Variables	VIF	1/VIF
AGE	1.152	0.8680
LIQ	1.083	0.9233
NPLR	1.071	0.9337
LOG (BSZ)	1.013	0.9871
MEAN VIF	1.079	

Source: Author's computation, 2022: Dependent Variable: Profitability (ROA)
AGE = Age; LQR = Liquidity; NPLR = Non-performing loan ratio; LOG (BSZ) = banks size

The result of VIF is reported in Table 3. Findings showed that values are above one, though not up to 10, suggesting that the underlying variables are moderately correlated and thus, no multi-collinearity issues exist in the estimated random effect model.

Table 4
Correlation Matrix Showing Relationship amid Banks' Internal Factors & Profitability

	DROA	PAGE	LLQR	NPLR	LLOG(BSZ)
AGE Pearson Correlation	0.6800**				
Sig (2- tailed)	.003	1			
N	150	150			
LQR Pearson Correlation	0.2542	0.1635			
Sig (2- tailed)	.122	.240	1		
N	150	150	150		
NPLR Pearson Correlation	-0.5115**	-0.4882*	-0.3629		
Sig (2- tailed)	.004	.010	.105	1	
N	150	150	150	150	
LOG Pearson Correlation	0.5991**	0.2333	0.2760	0.5012**	
Sig (2- tailed)	.001	.004	.011	.007	1
N	150	150	150	150	

** . Correlation is significant at the 0.01 level (2-tailed).

Dependent Variable: Profitability (ROA)

AGE = Age; LQR = Liquidity; NPLR = Non-performing loan ratio; LOG (BSZ) = banks size

Source: Author's computation, 2022

Relationship between banks' internal factors and ROA is displayed in Table 4. In this model, banks' internal factors are liquidity, non -performing loans, banks' size and age to attain desired outcome.

Table 5
Correlated Random Effects - Hausman Test

Equation: Untitled :Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. df.	Prob.
Cross-section random	5.184633	4	0.2689

Source: Author's computation, 2022

As displayed in Table 5, Hausman Test evaluated the suitability of model and the result showed that Chi- Sq.statistics was 5.184633 with a p-value of 0.2689, which can be deemed significant at 0.05 levels, suggesting that the random effect model is suitable

Table 6
Summary of Regression Results

Variable	Coefficient	Std.Error	t-statistics	Prob
C	3.759777	1.858471	2.023048	0.0566
AGE	1.446089	0.139151	2.599652	0.0171**
LQR	0.361744	0.913072	1.583762	0.1289
NPLR	-1.484262	0.933312	-1.590318	0.0274**
LOG (BSZ)	0.426187	0.005841	4.482939	0.0002***

Table 6
Weighted Statistics

R-squared	0.738994	Mean dependent var	0.163443
Adjusted R-squared	0.577989	S.D. dependent var	0.112024
S.E. of regression	0.080938	Akaike info criterion	-1.884242
F-statistic	6.958790	Durbin-Watson stat	1.554418
Prob(F-statistic)	0.001113		
Dependent Variable: PRT (ROA)		Method: Panel EGLS (2-way random effects)	
Total panel (balanced) observations: 150			

Dependent Variable: Profitability (ROA)

AGE = Age; LQR = Liquidity; NPLR = Non-performing loan ratio; LOG (BSZ) = banks size

Notes: *** 1% level of significance, **5% level of significance, * 10% level of significance

Source: Author's computation, 2022

The result as illustrated in Table 6 indicates that: $PRT = 3.7597 + 1.4460AGE + 0.3617LQR - 1.4842NPLR + 0.4261BSZ + e_0$. According to r^2 , explanatory variables that explain 73.9% of variation in ROA, while other factors account for remaining 26.1%. Adjusted R^2 being 0.5778 showed that the predictive power of model is high. This implies that all explanatory variables considered are reliable predictors. Given that the result is within the permissible range of 1.5 to 2.5, the Durbin-Watson statistics of 1.55 indicate that the model is devoid of serial correlation. As a result, the calculated model is not spurious. In this connection, the desired F-statistic of 6.9587 and probability value of 0.0011 demonstrate the model's significance at 5% significance level.

Table 7
Descriptive Statistics Of Macroeconomic Factors

	ROA	INF	EXH	GDP	INT
Mean	0.198781	12.93996	272.9454	4.52180	9.78035
Maximum	0.487725	17.52354	306.9210	13.8976	15.3728
Minimum	0.011002	9.009387	192.4403	-1.59123	6.47607
Std. Dev.	0.256616	10.117272	150.4746	3.77651	7.04468
Skewness	0.544663	0.013693	0.908727	1.058311	0.462367
Kurtosis	0.221185	1.541421	2.207459	2.566523	2.263024
Jarque-Bera	2.318181	0.443376	0.819013	0.972497	0.291306
Probability	1.946197	0.801165	0.663978	0.614929	0.864458
Obs	150	150	150	150	150

Source: Author's computation, 2022: Dependent Variable: Profitability (PRT)

INF =Inflation; INR= Interest rate; EXR = Exchange rate; GDP = Gross Domestic Product

The mean value of INF in Nigeria for period under consideration was 12.94% with lowest and highest values of 9.00% and 17.52% respectively as depicted in Table 7. GDP on average was 4.52% with minimum and maximum values of -1.59% and 13.89%. INT mean value of 9.78% with lowest and highest values of 6.47% and 15.37% respectively. Kurtosis statistics shows that the variables are leptokurtic; their values are lower than the optimum threshold of 3. Similarly, the Jarque-Bera shows that the macroeconomic variables under the consideration have normal distribution.

Table 8
Variance Inflation Factor

Variables	VIF	1/VIF
LOG (GDP)	1.052	0.95057
EXCH	1.076	0.92937
INF	1.052	0.95057
INT	1.114	0.80767
MEAN VIF	1.074	

Source: Author's computation, 2022: Dependent Variable: Profitability (PRT)"

INF =Inflation; INR= Interest rate; EXR = Exchange rate; GDP = Gross Domestic Product

The result of VIF is reported in Table 8. Values are above one, still not up to 10, suggesting that underlying variables are moderately correlated and thus, no multicollinearity issues exist in the estimated random effect model.

Table 9
Correlation Matrix Showing Relationship Between Macro- Economic Factors & PRT

	LROA	LLOG(GDP)	LEXCH	INF	LINT
ROA Pearson Correlation					
Sig (2- tailed)	1				
N	150				
LOG Pearson Correlation	0.5491**				
Sig (2- tailed)	.008	1			

N	150	150		
EXCH Pearson Correlation	0.6132**	0.4072*		
Sig (2- tailed)	.002	.011	1	
N	150	150	150	
INF Pearson Correlation	-0.6674*	-0.4922**	-0.4997*	
Sig (2- tailed)	.022	.002	.025	1
N	150	150	150	150
INT Pearson Correlation	-0.5124*	0.4034**	0.3124*	0.5213*
Sig (2- tailed)	.033	.004	.030	.022
N	150	150	150	150

** . Correlation is significant at the 0.01 level (2-tailed)

Dependent Variable: Profitability (PRT)

INF =Inflation; INR= Interest rate; EXR = Exchange rate; GDP = Gross Domestic Product

Source: Author's computation, 2022

Correlation matrix showing relationship between macro-economic factors & DPR is displayed in Table 9. Macro-economic variables represented here are gross domestic product, inflation, exchange and interest rates.

Table 10

Correlated Random Effects - Hausman Test

Equation: Untitled: Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. df.	Prob.
Cross-section random	6.454311	4	0.3242

Source: Author's computation, 2022

As illustrated in Table 10, Hausman Test evaluated the suitability of model and result showed that Chi- Sq.statistics was 6.454311 with a p-value of 0.3242, which can be deemed significant at 0.05 levels, suggesting that the random effect model is suitable

Table 11

Summary of Regression Result

Variable	Coefficient	Std.Error	t-statistics	Prob
LOG(GDP)	4.351593	1.294212	3.362349	0.0075**
INT	-0.033708	0.014349	-2.349013	0.0340**
INF	-0.050621	0.020461	-2.474023	0.0244**
EXR	0.192239	0.046977	1.963492	0.0500**
C	7.281467	3.326109	2.108067	0.0441

Table 11

Weighted Statistics

R-squared	0.698764	Mean dependent var	3.140602
Adjusted R-squared	0.534517	S.D. dependent var	2.098333
S.E. of regression	0.094598	Akaike info criterion	2.178977
F-statistic	7.483103	Durbin-Watson stat	1.785806
Prob(F-statistic)	0.034769		

Dependent Variable: PRT(ROA)

Method: Panel EGLS (Two-way random effects)

Total panel (balanced) observations: 150

Source: Author's computation, 2022; Dependent Variable: Profitability (ROA)

INF = Inflation; INR = Interest rate; EXR = Exchange rate; GDP = Gross Domestic Product

Notes: *** 1% level of significance, **5% level of significance, * 10% level of significance

The result as illustrated in Table 11 indicates that: $ROA = 7.2814 + 0.1922EXR - 0.0506INF - 0.0337INR + 4.3515GDP + e0$. R² value which is around 0.698764 indicate that macroeconomic variables in the model (GDP, INF, INR, and EXR) accounted for about 69.8% of the variation in profitability. Adjusted R-square was 0.534517, indicating that the predictor is well-fitted. The F-statistics for the model were 7.483103 and its p-value was 0.034769, demonstrating the model's significance at 5% level. The Durbin-Watson stat which is 1.78 indicates that the serial correlation does not exist in same model, meaning that it is desirable and can be used for the prediction.

DISCUSSION

The correlation matrix in Table 4 revealed that banks' age correlates positively and significantly (0.6800) with ROA, this indicates that older banks generate higher profitability. LQR with the value of 0.2152 though weak correlated positively with ROA. NPLR demonstrated significant but negative link (-0.5115) with ROA. It means that higher NPLR lowers MFBs profitability in Nigeria. Furthermore, significant and positive correlation (0.5991) exist between BSZ and ROA indicating that larger bank size enhances MFBs profitability. This shows that banks with many branches have higher profitability. Findings revealed that positive and significant relationship exist between BSZ and NPLR (0.5012), meaning that more the bank branches, the higher the non-performing loans. Moreover, weak and negative relationship subsists between AGE and NPLR (-0.4882) implying that older banks have lower NPLR; this may be due to series of the experiences they might have garnered over the years. Thus, results revealed that all proxies of banks' specific factors are positively associated with ROA except NPLR. In contrast to AGE and LOG (BSZ) having significant relationship, LQR does not. NPLR, LQR maintained a negligible and adverse relationship. The regression result in Table 6 showed that AGE had a favorable and considerable effect on ROA, and all independent variables played significant role in predicting phenomenon.

As a result, an increase in AGE of one unit causes a ROA increase of 1.4460. This implies that the older the banks, the more profitable they are; this may be due to series of experiences these banks might have garnered over years. Also, newly founded firms may not be profit oriented in their early years because they might prioritize growing their market share over enhancing and maintaining their financial stability. This outcome is in line with [Musah \(2017\)](#) and [Berteji and Hammami \(2016\)](#) who asserted that age is crucial factor influencing banks' performance. Also, the value of LOG (BSZ) is 0.4261, indicating that BSZ has a favorable and profound effect on ROA. This demonstrates how larger banks make more money. BSZ has capability to affect its profitability. This could be as larger firms have easier access to financial market than smaller firms. Also, larger banks have advantage over smaller banks in that can benefit from economies of scale, which increases efficiency ([Lestaria et al., 2021](#)). Since smaller banks are assumed to be less powerful, they will likely have trouble competing with larger companies in highly viable markets. The conclusion is consistent with that [Khanal \(2019\)](#) and [Assfaw \(2019\)](#). LQR, which is metric for meeting short-term obligations from banks' liquid assets, showed the positive but

negligible effect on ROA with value of 0.3617 indicating that liquidity has inconsequential effect on profitability.

This result corroborates the findings of [Nguyen \(2022\)](#), [Koroleva \(2021\)](#) and [Hosen, \(2020\)](#). Moreover, ROA was significantly but unfavorably impacted by NPLR. This demonstrates that high NPLR are associated with low profitability. A higher NPLR increases lending risk, which could result in subprime loans, lower profitability, and instability in the financial system. This is in line with the findings of [Gwacha \(2019\)](#) and [Sanyaolu \(2019\)](#). High NPLR adversely affects stability of financial markets and potentiality of banking institutions. Correlation results in Table 9 showed that GDP with value of 0.5491, associated positively, significantly with ROA, suggesting that profitability increases as GDP improves. EXR exhibited significant and positive correlation with ROA. However, INF and INT portend moderate but the negative relationships with ROA, implying that higher inflation and interest rates decreases the profitability of banks. Moreover, LOG showed moderate but negative correlation with INF, signifying that the higher inflation rates adversely affect GDP which invariably decreases banks' profitability. However, LOG (GDP) exhibited weak and positive relationships with EXR and INT. Findings from Table 11 revealed that the coefficient of GDP which is 4.3515 indicates that GDP positively and significantly affect ROA in the selected MFBs ($t=3.362349$, $p=0.0075$). A unit increase in GDP produces 4.35 rises in ROA; indicating that higher GDP increases profitability of microfinance banks.

This reveals that GDP being the financial health of a country is a salient factor influencing the profitability of Nigerian banks. This corroborates the assertion of [Mutonga \(2022\)](#) and [Pham et al. \(2020\)](#) that increased GDP increases corporate earnings of firms, which eventually increases profitability. This report is in conformity with submission of [Do et al. \(2021\)](#). Moreover, EXR with value of 0.1922 positively significantly affect ROA ($t=1.9634$, $p=0.0500$). This signifies that higher EXR enhances profitability. When Nigerian currency appreciates, ROA increases by 0.192%. This finding tallies with [Pham et al. \(2020\)](#). In Contrast, the coefficient of INF being -0.0506 affects ROA negatively but significantly. ($t=-2.4740$, $p=0.0244$). This indicates that increased inflation rates reduces profitability of banks significantly. Excessive inflation has serious repercussions upon the general economic performance. Inflation reduces performance (profitability) of financial institutions. Thus, the result corroborates the findings of [Yuan et al. \(2022\)](#) and [Horobet \(2021\)](#) who found that inflation affects performance of banks adversely. INT having a coefficient of -0.0337 affects ROA negatively but significantly ($t=-2.3490$, $p=0.0340$). The negative sign, denotes an unexpected rise in interest rates, deters bank customers from taking out loans, raises borrowers' interest payments, lowers repayment capacity, raises default rate and lowers banks' profitability respectively. This report is in tandem with [Hosen \(2020\)](#).

CONCLUSION

This study investigated salient factors affecting MFBs' profitability in Nigeria from 2012-2021. Fifteen MFBs were selected from the South West region of Nigeria using purposive sampling method. Data was derived from published reports of selected MFBs in Nigeria. The return on Assets (ROA) was used as measure of profitability. Liquidity, non-performing loans, the bank's size and age, exchange rate, inflation rate, interest rate and gross domestic product were used as predictors. Data were analyzed using descriptive, regression and correlation techniques. Findings revealed that banks specific factors like the AGE and BSZ positively and significantly affected profitability of banks; NPLR, though significant affected profitability adversely. LQR,

on its own had favorable but minimal effect on profitability. Thus, study confirms submission of previous findings that AGE, BSZ, NPLR have profound effect on MFBs profitability in Nigeria. Regarding macroeconomic variables, GDP and EXR both exhibited favorable and considerable effect on profitability; implying that MFBs profitability could be enhanced under favorable economic conditions. INF and INT rates on contrary portend adverse but profound effect on banks' profitability. Thus, research concludes that banks' specific factors and macroeconomic variables influenced MFBs profitability significantly in the South West region of Nigeria. It is suggested that MFBs should strive to reduce their NPLR so as to enhance profitability. Also, government should implement sound macroeconomic policies that could favorably impact on stability of Nigerian MFBs. Study is of paramount status to policymakers, bankers, regulators, bank management, shareholders and other stakeholders as it will assist them in identifying key parameters for maximizing the profit, which will ultimately result in MFBs sustainability and competitiveness.

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