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Article

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DETERMINANTS OF PROFITABILITY OF NIGERIAN DEPOSIT MONEY BANKS

Wasiu Abiodun Sanyaolu[1], Trimisiu Tunji Siynbola[2], Gbadebo Tirimisiyu Ogunmefun[3], Afeez Babatunde Makinde[4]

ABSTRACT

This study investigates banks' specific and macroeconomic determinants of profitability of ten listed deposit money banks in Nigerian Stock Exchange from 2008 to 2017 using fixed effect regression. The result reveals that capital adequacy, nonperforming loan, loan to total asset and size have significant positive effect on profitability, while age was found to exert significant but negative effect on profitability. The study could not however establish significant positive effect of macroeconomic indicators (economic growth and interest rate) on profitability of deposit money banks while inflation rate has negative but insignificant influence on profitability. Arising from the findings, the study recommends that government should initiate and execute economic policies that will improve the profitability of deposit money banks in Nigeria given the key role of the sector to the economy while banks should also manage their specific variables that are likely to improve profitability.

Keywords: banks' specific indicators, deposit money banks, macroeconomic indicators, fixed effect and profitability.

JEL classification: G10, G22

1. INTRODUCTION

The growth and stability of any business cannot be guaranteed in isolation of profit. Profit is simply defined as the difference between revenue and cost incurred in generating revenue. Profitability is very important in banks' business affairs just as in other businesses as they need to generate sufficient profit so as to maximize shareholders wealth in form of dividend payment or capital appreciation of shares and for growth and expansion. Profitability in the banking sector according to Olaoye and Olarewaju (2015) is a measure of how efficient bank performs its intermediation role and the extent to which it is able to render quality service to customers. Maximization of profit is considered by Odusanya, Yinusa and Bamidele (2018) as a fundamental objective that firms must pursue so as to secure their going concern and as well as being able to withstand competition. This is particularly true for the banking sector arising from the key roles it plays towards smooth and efficient running of an economy and coupled with the high degree of competition and regulations the sector is exposed to. Profit in the banking sector according to Kajola, Sanyaolu, Alao and Ojunrongbe (2019) represents a favorable result arising from prudent allocation and utilization of resources to its core activities of financial intermediation.

The investigation of factors determining banks profitability is expedient for a considerable number of reasons; first, the Nigerian banking sector has undergone a series of reforms and has been subjected to high volatility in their operating environment under different political and economic regimes

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(Odusanya *et al*., 2018). Also, given its key role towards the attainment of desired level of growth in economic activities and its sustainability, the growth and stability of the sector whose profitability is the key indicator must be evaluated and appraised from time to time as profitability has serious implications on banks stability and performance (see Olaoye and Olanrewaju, 2015 and Samad, 2015).

To generate sufficient profit therefore requires banks' finance and corporate managers to know different factors that influence profitability. These factors can be categorized into banks' specific and macroeconomic indicators. The banks' specific determinants are those factors that are special to banks while macroeconomic determinants affect the entire industries in the economy. It is however disappointing after a cursory review of the existing body of literature in Nigeria and abroad to discover that attention of scholars in this area has been devoted to effects of single variables such as liquidity on banks profitability (see Idowu, Essien and Adegboyega, 2017; Kehinde, 2013; Ibe, 2013 and Obiakor & Okwu, 2011), macroeconomic variables and profitability (see Ifuero and Chijuka, 2014; Flamini, McDonald and Schumacher 2009; Sharma& Mani, 2012), market share and profitability (see Ejoh and Sackey, 2014). Few studies have been conducted on determinants of profitability in the banking sector (see Ilaboya & Iyoha, 2016 and Kajola, Olabisi, Ajayi and Agbatogun, 2018). Also, there is a mismatch between variables considered by these few studies. The situation is further exacerbated in Nigeria as the few studies that have been conducted are far from reaching consensus as to their findings with respect to how identified independent variables influe-nce banks' profitability. To this extent, the present study aims to investigate different determinants of profitability in the banking sector with respect to both banks' specific and as well as macroeconomic indicators in Nigeria.

Arising from the identified gaps, the following research questions which are in line with the specific objectives are raised:

i. What is the effect of liquidity on profitability of DMBs in Nigeria
ii. To what extent does capital adequacy influence profitability of DMBs in Nigeria
iii. What is the channel of the effect of age on profitability of DMs in Nigeria?
iv. How does nonperforming loan affect profitability of DMBs in Nigeria
v. What is the effect of loan to total asset on profitability of DMBs in Nigeria
vi. What is the influence of size profitability of DMBs in Nigeria
vii. How does interest rate influence profitability of DMBs in Nigeria
viii. To what extent does inflation rate affect profitability of DMBs in Nigeria
ix. What is the effect of economic growth(GDP growth rate) on profitability of DMBs in Nigeria

Research Hypotheses

i. Liquidity has no significant effect on profitability of DMBs in Nigeria.
ii. Capital adequacy has no significant influence on profitability of DMBs in Nigeria.
iii. Age has no significant effect on profitability of listed DMBs in Nigeria.
iv. Nonperforming loan has no significant effect on profitability of listed DMBs in Nigeria.
v. Loan to total asset has no significant effect on profitability of listed DMBs in Nigeria.
vi. Size has no significant effect on profitability of DMBs in Nigeria.
vii. Interest rate has no significant influence on profitability of DMBs in Nigeria.
viii. Inflation rate has no significant effect on profitability of listed DMBs in Nigeria.
ix. Economic growth has no significant effect on profitability of DMBs in Nigeria.

2. LITERATURE REVIEW

2.1 Theoretical Framework

Many theoretical postulates exist on factors that drive profitability in the finance literature

in general and those relating to the banking sector in particular. The notable ones among these theories are: portfolio theory, efficient structure theory, resource based theory, frictional theory, finance theory of profit (capital asset), Modigliani-Miller (1958) theorem, signaling hypothesis and arbitrage pricing theory.

The portfolio theory emphasizes banks' investment diversification into different cla-sses of assets in bid to avoiding unsystematic risk.Banks attain efficient portfolio by taking into consideration the risk, and return profile of each class of asset and as well as the size of the portfolio which determines the level of investment in each class of asset.

On the other hand, the efficient structure theory states that the ability of a bank to earn profit is predicated on efficiency, implying that efficient banks are able to make higher profit than those not efficient. Efficiency in this sense can be viewed via two approaches- X- efficiency and scale efficiency. The X-efficiency states that banks ability to make profit is anchored in its ability to reduce costs. Such firms are inclined to gain larger market shares, which may manifest in higher levels on market concentration, but without any causal relationship from concentration to profitability (Athanasoglou, Delis&Staikouras, 2006). On the contrary, the scale efficiency of banks' improved profitability is premised on economics of scale arising from size. These economies of scale that is attributable to larger size translate to reduction in operating cost as banks will be able to spread their operations over wide range of activities. The efficient structure theory like the portfolio theory largely assumes that bank's performance is influenced by internal efficiencies and managerial decisions (Athanasoglou *et al*., 2006).

According to the resource-based theory, every investor commits his resources to a project with the aim of making profit. For profit to be made, firms need some resources that will allow a smooth operation to take place, which will give rise to profit. The theory that best explains this is the resource-based theory. This theory is credited toWernerfelt (1984). It perceives the firm to have a bundle of resources that it combines and utilizes to create capacities that will earn above average profit. The resources therefore serve as the strength to an individual bank that can be used to create competitive advantage. This theory gains its relevance to this study as banks have some common peculiar characteristics which allows for the generalization of the sampled banks to be valid and reliable for the entire population. The sources of strength identified in this study are:- liquidity, capital adequacy, age, nonperforming loan, loan to total asset, and size; all these represent the resources used by banks to create and maintain their competencies within their operation.

The arbitrage pricing theoryemanated from the handiwork ofRoss in (1977). This theory is based on linearity assumption between macroeconomic variables and expected returns on investment. It also states that market risk (beta risk) accounts for the degree of correlation to changes in each variable.

The frictional theory of profit regards capital as substitution reward to investors for saving and investing their income rather than consuming or hoarding them. Investors/shareholders we therefore peruse through publicly released information like banks financial statement before investing their funds.The reason for this is for them to measure the security of their investment in the form of viability and stability. Investors will therefore consider companies that can pay dividend as reward for their investment. All these assumptions are realistic under static economy without occasional disturbance like inflation and war. However, in the case of occasional disturbance, firms can either make abnormal profit or abnormal loss depending on whether the disturbance is favorable or unfavorable.

The finance theory of profit (capital asset) is traceable to foureconomists Sharpe, Litner, Treynor and Mossin independently between 1964 and 1966. It was developed so as to simplify the portfolio theory of profit by Makowitz. It states that market structure in which a firm operates does not determine profit but classes of risk it is exposed to. Therefore, in this study, non-performing loan is expected to affect profitability as it relates to the firms' credit risk emanating from their core activities of financial intermediation of funds.

The Modigliani and Miller theory stipulates that companies having the same risk have identical market and book return on investment. This therefore implies that company that uses more of equity capital is faced with less risk and thus; attracts lower rate of return on investment in as much as the investors are risk averse (Hoffmann, 2011). Therefore, inverse relationship exists between capital adequacy ratio and profitability. This theory according to Kajola *et al*. (2018) is not applicable to Nigeria due to the imperfect nature of its operating environment.

The signaling hypothesis is suitable to the Nigerian business environment that is characterized by imperfections. The theory holds that there exists information asymmetry between managers and investors in the sense that managers have the access to private information which investors do not have. According to Myers and Majluf (1984), firms need to release a part of the private information to investors and the public so as to attract more capital. This, according to Kajola *et al*., (2018), will lead to information symmetry between managers and shareholders and enable well capitalized banks to perform better. This theory therefore suggests a direct relationship between capital adequacy and performance.

2.2 Empirical Review and Development of Hypotheses

Muriithi, Waweru and Muturi (2016) used regression analysis involving fixed effect and generalized methods of moments and found evidence in support of significant negative influence of nonperforming loan on profitability of 43 sampled commercial banks in Kenya registered from 2005 to 2014. In the same direction,Annor and Obeng (2017) focused on the influence of credit risk management on profitability of quoted commercial banks of six selected listed banks in the Ghana stock exchange. The findings show significant positive influence of capital adequacy on profitability while negative but a significant effect of nonperforming loan was established on profitability of the selected banks. Contrarily to the findings above, Alshatti (2015) analyzed the influence of credit risk management on financial performance of 13 Jordanian commercial banks between 2005 and 2013 by extracting relevant data from annual reports and accounts of the sampled banks. The result of the regression analysis shows that credit risk management has significant positive influence on profitability. Fredericks (2015) found significant negative influence of operating expenses on profitability of banks in Uganda.

Kadioglu, Telcecme and Ocal (2017) focused on asset quality and profitability of 55 banks in Turkey by obtaining quarterly data from the 1st quarter of 2005 to the 3rd quarter of 2016. The findings from the regression analysis show evidence in support of significant negative influence of nonperforming loan on profitability (ROA and ROE). It implies that lower nonperforming loan translates to higher asset quality and profitability. Also, Aykut (2016) assessed the effect of credit and market risk on bank performance of quoted Turkish banks. With the use of generalized autoregressive conditional heteroscedastic approach for weekly data generated between January 18 2002 and October 30 2015, the results suggested that credit risk has inverse and foreign exchange has a direct effect on banking sector profitability.

In the study undertaken by Rahman, Hamid and Khan (2015), 25 commercial banks were sampled in Bangladesh from 2006 to 2013. The result of the regression indicates significant positive influence of capital adequacy, size and loan magnitude on profitability. Inflation was however found to exert significant negative influence on profitability. In the same direction, Kipruto, Wepukhulu and Osodo (2017) examined the effect of capital adequacy on profitability of second tier commercial banks in Kenya. The finding from the regression shows significant positive influence of capital adequacy on profitability. On the contrarily, Çekrezi (2015) sampled 16 Albanian commercial banks and obtained data from 2010 to 2013. The result of the regression provides evidence in support of significant negative influence of capital adequacy and liquidity on profitability, while size and age were found to positively but insignificantly influence profitability.

Bagh, *et al.,* (2017) focused on liquidity management and profitability of 30 Pakistani banks for the periods 2006 to 2016. The result de-

monstrates that advances to deposit ratio, cash deposit ratio and deposit asset ratio, have positive and significant impact on ROA, whereas negative and significant impact on ROA. Current ratio advances to deposit ratio, cash deposit ratio, and debt to asset ratio have positive and significant impact on ROE.

Dahiyat (2016) conducted investigation on profitability determinants of brokerage firms in the Amman Stock Exchange. Relevant data were gathered from the annual reports and financial statements of the sampled firms from 2013 to 2017. The findings from the regression analysis reveals that asset quality and capital adequacy have significant positive influence on profitability, while the size of broker on the other hand shows negative but significant effect on profitability. The study could not however find evidence in support of significant influence of inflation rate and economic growth on profitability. By contrast, Doğan (2013) studied firm size and profitability of 200 firms by gathering data from the annual reports of the sampled banks from 2008 to 2011. The result of the regression analysis reveals that size has significant positive effect on profitability. The findings related to leverage and age as control variables showed negative but significant influence on profitability, while liquidity was found to exert significant positive influence on profitability. This finding by Dogan (2013) is also in line with that of Majumdar (1997) who focused on size and age as determinants of profitability of 1020 firms in India. The finding reveals that age has significant negative influence on profitability, while size has significant positive influence on profitability.

In Nigeria, Kajola, Adedeji, Olabisi and Babaolu (2018) focused attention on credit risk management and profitability. Two surrogates ROA and ROE were used to capture profitability while credit risk was captured by ratio of nonperforming loan to total loan, nonperforming loan to deposit ratio and capital adequacy ratio. The results obtained from the generalized random effect reveal the existence of significant positive effect of nonperforming loan to total loan ratio and capital adequacy ratio while nonperforming loan to deposit ratio was found to exert significant negative effect on loan profitability measured by ROA and ROE. Similarly, Okere, Isiaka, and Ogunlowore (2018) extracted data related to credit risk and liquidity risk and profitability of Nigerian DMBs. It was found that credit and liquidity risk exert significant positive influence on profitability of banks. In the same direction, Agbeja, Adelakun and Olufemi (2015) focused on influence of capital adequacy on profitability of banks. Data of the sampled five banks for the time frame from 2010 to 2014 were extracted from the annual reports and financial statements of these banks. The findings from the regression analysis showed that capital adequacy exerts significant and positive effect on profitability. Uwuigbe, Uwuigbe and Oyewo (2015) conducted a study that utilized data of ten DMBs in Nigeria from 2007 to 2011. The findings from the regression analysis provide evidence in support of significant but negative influence of nonperforming loan and bad debt on profitability.

Soyemi, Akinpelu and Ogunleye (2013) focused their research attention on the examination of determinants of profitability of DMBs after consolidation. The study found signifycant negative relationship between size and capital adequacy on profitability. Further findings show no significant effect of financial structure and macroeconomic variables on profitability. Similarly, Ani, Ugwuanyi, Ezeudu and Ugwuanyi (2012**)** assessed bank specific determinants of profitability of DMBs in Nigeria by using pooled OLS involving regression analysis on 15 listed DMBs. The study found evidence in support of significant positive influence of total liability to total asset ratio (TL/TA) while the influence of capital adequacy (TE/TA) was found to have a negative effect on profitability. On the other hand, size was found to exert no significant positive influence on profitability.

Agbeja, Adelakun, and Olufemi (2015) focused on the effect of capital adequacy on profitability of commercial banks in Nigeria by obtaining relevant data from the annual reports and accounts of the sampled banks for five years. The findings reveal the existence of significant positive influence of capital adequacy on profitability of commercial banks. This is corroborated by the findings of Asikhia and Sokefun (2013) who examined the

influence of capital adequacy on the profitability of Nigerian DMBs from 2006 to 2010. The findings obtained from the analysis of primary data show no significant relationship between capital adequacy and profitability but the secondary data results show positive and significant relationship between capital adequacy and bank profitability.

Liquidity and Profitability

Liquidity depicts the ability of a bank to fulfill its short term obligation. It is a strong measure of banks' strength as liquid banks are able to fulfill their short-term maturing obligations and the withdrawal demand of depositors. Generally, two schools of thought exist on liquidity and profitability dynamics. The first school, which is the most popular, is the one that maintains that the relationship between liquidity and profitability is tradeoff, implying that the pursuit of one will automatically take a toll on the other. Such view was maintained by Idowu, Essien and Adegboyega (2017), and Dash and Hanuman (2008). By contrast, another school of thought has maintained that the two objectives can be achieved simultaneously.

In a nutshell, an optimum financial management strategy should be the one that balances the dilemma between liquidity and profitability. This assists in maintaining optimum level of liquidity that will translate to optimum profit by ensuring that banks do not suffer excess or low level of liquidity as the two have adverse effect on banks' profitability. Arising from this, the following null hypothesis has been developed:

Ho_1: liquidity has no significant effect on profitability of Nigerian DMBs

Capital Adequacy and Profitability

Capital adequacy is an important element needed for smooth and efficient operations of financial institutions. Efficient financial intermediation to some extent is premised on the ability of banks to raise sufficient capital as their capital can be used to finance customers' loan which in turn contributes to banks' profit. Arising from the fundamental roles of capital adequacy towards smooth and efficient operations, different regulations such as minimum capital requirements have been imposed on banks in a bid to improve their capitalization. Capital adequacy is fundamental to banks' success in a number of ways; first, banks' stability and strength is significantly anchored in capital adequacy, then, ability of banks to raise sufficient capital also enhances future growth and boosts public confidence, and lastly well capitalized banks are able to serve the interest of customers as well as to safeguard banks against unexpected loss (Furlong 2008). It is also a central issue of prudential regulation (Torbira and Zaagha, 2016). Arising from this, the following hypothesis has been developed:

Ho_2: capital adequacy has no significant effect on profitability of Nigerian DMBs

Bank` Age and Profitability

Age according to Ilaboya and Ohiokha (2016) is the number of years a thing or person has been in existence. In this study, age is defined as number of years in which a bank has been listed. Listing years are considered in this study against years of incorporation as listed banks are likely to attract more profitability due to access to huge capital arising from the sale of shares (among other things) since banks' profitability, to a reasonable extent depends on the quantum, quality, and structure of capital. Age and profitability nexus have received considerable research attentions; but one peculiar characteristic of these existing studies is there lack of consensus as to the exact effect of age on profitability. Arising from this, the following hypothesis has been developed:

Ho_3: age has no significant effect on profitability of Nigerian DMBs.

Bank Size and Profitability

The relationship between bank size and profitability is believed to be positive and significant. This is expected because larger banks are able to grant more loans and advances to borrowers, accept higher risks, and increase the number of customers which in turn

increases deposit and non-interest income arising from charges. Regehr and Sengupta (2016) opined that the economies of scale associated with bank size with the attendant benefits of spreading fixed costs over a larger asset base, which reduces average cost, is also a contributing factor to increased profitability. Mester (2010) argued that increasing banks' size can also reduce risk by diversifying operations across product lines, sectors, and regions.AlGhusin (2015) and Rahman, Hamid and, Khan (2015) are those that have established positive and significant effect of size on profitability. While researchers like (Soyemi, Akinpelu and Ogunleye, 2013 and Ani, Ugwuanyi, Ezeudu and Ugwuanyi 2012) have found negative but significant effect of size on profitability.

Arising from this lack of consensus in findings, the study hypothesized in a null form that:

Ho_4: size has no significant effect on profitability of Nigerian DMBs.

Asset Quality defined as Non-performing Loan to Total Loan

Asset quality, according to Kadioglu, Telceken and Ocal (2017), is one the principal drivers of banks profitability and economy. Asset quality is the measure of the ratio of non-performing loan to total loan of a bank. The higher this ratio, the riskier the loans and invariably the lower the profitability. As banks in most developing countries like Nigeria earn their profit through advancement of loans, their ability to recover the principal and interest has serious implications on profitability and stability. If a bank cannot recover a substantial part of loan granted to borrowers, its operations will be altered as it will not be able to finance further loan demand from borrowers, to sustain depositors' withdrawal and meet short term obligations. Findings from prior studies on asset quality and profitability in the banking sector have remained contentious, as some found the effect of asset quality on profitability to be positive and significant while others found the effect of nonperforming loan on profitability to be negative. Arising from this, the study hypothesized in a null form that:

H_{05}: asset quality has no significant effect on profitability of DMBs in Nigeria.

LOTA and Profitability

The ratio of bank loan to total asset measures the proportion of banks' asset that is advanced out as loan. Loan and advances in assets are the principal sources of revenue to banks and are expected to positively and signifycantly influence profit. The higher the transformation of deposit into loan *ceteris paribus*, the higher the interest margin and profits. However, if a bank needs to increase risk to have a higher loan-to-asset ratio, then profits may decrease. Arising from this, the following hypothesis has been developed:

Ho_6: loan to total asset has no significant effect on profitability of DMBs in Nigeria.

Economic Growth and Profitability

Economic growth is mostly measured by the growth rate in the monetary value of all goods and services produced in an economy over a period of time. The common measure of economic growth is Gross Domestic Product (GDP). An increase in GDP implies that the economic activities of the country are experiencing boom. During this boom period, firms need more capital to finance their operations so as to benefit from this boom. Arising from this, firms may demand for more loans, which in turn increase banks' deposit income. The reverse is the case during the period of recession. Arising from this, a period of increase economic growth is expected to translate to banks' profitability. Arising from this, the following hypothesis has been developed:

Ho_7: economic growth has no significant effect on profitability of Nigerian DMBs.

Inflation and Profitability

Inflation is the persistent rise in the general price level of goods and services. Theoretically, during the period of high inflation, firms will need more fund to meet up with the increase in price of production, consumers will want to obtain loans so as to maintain

their usual consumption level. All these will translate to high demand for banks' loan, which will in turn induce deposit income. Arising from this, the following hypothesis has been developed:

Ho_8: inflation rate has no significant effect on profitability of Nigerian DMBs.

Interest Rate and Profitability

Interest rate is the rate at which bank charges the amounts they grant as loans. Higher interest rate ceteris paribus is expected to increase deposit income, which will in turn contribute positively to profitability. Arising from this, the following hypothesis has been developed:

Ho_9: interest rate has no significant effect on profitability of Nigerian DMBs.

3. METHODOLOGY

3.1 Research Design

Due to the nature of this study, an *ex post facto* research is adopted given that the data are historical as they relate to past events.

3.2 Source of Data

This study obtained relevant data from secondary source by extracting the relevant data from the annual reports and financial statements of the sampled banks for the sampled periods while those related to macroeconomics were sourced from the annual Central Bank of Nigeria (CBN) statistical bulletin.

3.3 Population, Sample and Sampling Technique

The population for the study included 15 DMBs. The sample size chosen is 10 which represent 67% of the entire population of the study and thus satisfies the minimum sampling requirement as 67% of the population is sufficient in making generalization. The sampling technique adopted is purposive based on the size of the banks. The listed banks sampled are: GTBank Plc, UBA Plc, Access Bank Plc, Zenith Bank Plc, First Bank Plc, Sterling Bank Plc, Diamond Bank Plc, Fidelity Bank Plc, Wema Bank Plc and Unity Bank Plc.

3.4 Data Analysis Instrument

The study used panel data and multiple regression analysis involving fixed effect adopted in testing the nine hypotheses of the study. The fixed effect was chosen based on the result of the Hausman specification which is significant at 0.05

3.5 Variable Description and Measurement

Dependent variable: profitability captured by return on asset (ROA) is the only dependent variable for this study. Liquidity ratio measure by cash and treasury bill as a proportion of total deposit, capital adequacy ratio (CAR),

Table 3.1 *Measurement of Variables*

Variable	Acronym	Measure	Expected effect
Dependent variables			
Profitability	ROA	Profit after tax/ total asset	
Independent variables			
Liquidity	LIQR	Cash +treasury bills/total deposit	+
Capital adequacy	CAR	Equity capital/total asset	+
Age	AGE	Natural log of listing years	+
Nonperforming loan	NPLR	Nonperforming loan/total loan	
Loan to total asset	LOTA	Total loan/ Total Asset	+
Size	LASSET	Natural logarithm of total asset	+
Economic growth	GDPG	$\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$	+
Inflation rate	INFR	Percentage of inflation rate	_
Interest rate	INTE	Percentage of interest rate	+

Source: Researchers' compilation

age (listing year), nonperforming loan (NPLR), loan to deposit ratio (LOTA) and size (LASSET). The common proxies used to capture bank specific determinants of profitability while gross domestic growth rate (GDPG), interests rate (INTE) and inflation rate (INFR) were the macroeconomic determinants considered.

3.6 Model Specification

As a result of the panel nature of data used in the study, panel data methodology was adopted. The specific models for the study are depicted in equations below:

$ROA_{it} = \beta_0 + \beta 1 LIQR_{it} + \beta_2 CAR_{it} + \beta_{3it} AGE_{it} + \beta_4 NPLR_{it} + \beta_5 LOTA_{it}\ \beta_6 SZ_{it} + \beta 7 GGDP + \beta_8 INF + \beta_9 INT + e_{it}$ ..... (1)

Where,

ROA_{it} = Return on Asset of bank i in period t

$LIQR_{it}$ = Liquidity Ratio i in period t

CAR_{it} = Capital Adequacy Ratio of bank i in period t

$NPLR_{it}$ = Asset Quality of bank i in period t

$LOTA_{it}$ =Loan to Total Asset of bank i in period t

SZ_{it} = Size of bank i in period t

GGDP= Growth in Gross Domestic Product

INF = Inflation Rate

INT = Interest Rate

ei_t = Error term

4. RESULTS AND DISCUSSION

The results of the descriptive statistics of the variables used in the study are presented in Table 2. Table 2 shows that ROA has a mean value of 0.010 and varies from the minimum value of -0.105 to the maximum value of 0.120. LIQ has a mean value of 0.211 with the minimum 0.012 and the maximum of 0.622. CAR has a mean value of 0.143 and ranges from -0.105 to 0.804. The average age of the sampled bank is 18.160 and ranges from the minimum of 0.000 to the maximum of 47. NPLR is averaged 0.099 and ranges from 0.023 to 0.970. LOTA has a mean value of 0.516 with the minimum of 0.032 and the maximum of 4.538. LASSET has a mean value of 20.74 and ranges from 17.876 to 22.416. INTE has a mean value of 0.165 with the minimum of 0.140 and the maximum of 0.184. INFR is averaged 0.119 with the minimum of 0.080 and the maximum of 0.184. Finally, GDPG is averaged 0.133 with the minimum value of -0.053 and the maximum of 0.830.

Table 4.1 *Summary of Descriptive Statistics*

	ROA	LIQ	CAR	AGE	NPLR	LOTA	LASSET	INTE	INFR	GDPG
Mean	0.010	0.211	0.143	18.160	0.099	0.516	20.74	0.165	0.119	0.133
Median	0.014	0.191	0.144	15.00	0.050	0.495	20.74	0.165	0.119	0.133
Maximum	0.120	0.622	0.804	47.00	0.970	4.538	22.416	0.184	0.165	0.830
Minimum	-0.105	0.012	-0.402	0.000	0.023	0.032	17.876	0.140	0.080	-0.053
Std. Dev	194.995	9.024	1661.506	11.857	1777.069	24790.3	4.407	6.021	5.558	198.97
Observations	100	100	100	100	100	100	100	100	100	100

Source: Researchers' computation (2019) using E-views 9

Table 4.2 *Correlation Matrix*

	ROA	LIQ	CAR	AGE	NPLR	LOTA	LASSET	INTE	INFR	GDPG
ROA	1.000000									
LIQ	0.253706	1.00000								
CAR	0.660986	0.12330	1.00000							
AGE	0.104402	0.1302	-0.119	1.00000						
NPLR	-0.132321	-0.370	-0.223	-0.122	1.000000					
LOTA	0.416220	-0.070	0.630	0.054	-0.085	1.000000				
LASSET	0.253267	0.645	0.077	0.390	-0.319	-0.241	1.000000			
INTE	0.064340	-0.100	0.071	-0.024	0.196	0.045	-0.145	1.000000		
INFR	0.035883	-0.104	0.0497	-0.025	0.202	0.048	-0.004	-0.262	1.000000	
GDPG	0.013209	0.094	0.001	0.051	-0.055	-0.025	0.144	-0.680	0.488	1.000000

Source: Researchers' computation (2019) using E-views 9

The correlation table above shows that liquidity, capital adequacy, age loan to total asset, size, interest rate, inflation rate and GDPG rate are all positively associated with profitability while only nonperforming loan has negative association with profitability. Also, none of the variables' coefficient is above 0.8 implying that there is no autocorrelation problem.

The value of the F-Statistic for the model is significant at 1% (prob value = 0.000). It implies the the fitness of the variables in the model. The Durbin Watson value of 1.491363 shows the absence of serial autocorrelation as the value is within the acceptable threshold of 1 (Gujarati, 2003, Asaeed, 2005 and Gujarati and Porter, 2009).

Table 4.3 *Pooled OLS Regression Results*

Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.107408	0.082669	-1.299250	0.1974
LIQ	0.024227	0.020713	1.169627	0.2454
CAR	0.148079	0.026409	5.607189	0.0000
AGE	0.000250	0.000185	1.350092	0.1806
NPLR	0.019162	0.015525	1.234246	0.2205
LOTA	0.003248	0.006852	0.474121	0.6366
LASSET	0.003581	0.003485	1.027455	0.3071
INTE	0.074624	0.247270	0.301790	0.7635
INFR	0.001716	0.086217	0.019900	0.9842
GDPG	0.000601	0.013151	0.045709	0.9636
R-squared	0.509343			
Adjusted R-squared	0.457391			
F-statistic	9.804119			
Prob(F-statistic)	0.000000			
DW	1.491363			

Source: Researchers' computation (2019) using E-views 9

Table 4.4 *Fixed Effect for Determinants of Profitability*

FIXED EFFECT				
Dependent Variable: ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.762012	0.242618	-3.140793	0.0024
LIQ	0.024754	0.022322	1.108923	0.2710
CAR	0.171725	0.024418	7.032593	0.0000
AGE	-0.004454	0.002013	-2.212867	0.0299
NPLR	0.045809	0.014699	3.116592	0.0026
LOTA	0.016082	0.008085	1.989264	0.0503
LASSET	0.038119	0.012580	3.030114	0.0033
INTE	0.114841	0.217111	0.528949	0.5984
INFR	-0.000419	0.074881	-0.005597	0.9955
GDPG	0.004691	0.011658	0.402385	0.6885
R-squared	0.684564			
Adjusted R-squared	0.609855			
F-statistic	9.163115			
Prob(F-statistic)	0.000000			
DW	1.984220			

Source: Researchers' computation (2019) using E-views 9

Table 4.5 *Fixed Effect for Determinants of Profitability*

RANDOM EFFECT				
Dependent Variable: ROA				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.107408	0.070099	-1.532228	0.1292
LIQ	0.024227	0.017564	1.379361	0.1714
CAR	0.148079	0.022393	6.612653	0.0000
AGE	0.000250	0.000157	1.592187	0.1151
NPLR	0.019162	0.013165	1.455567	0.1492
LOTA	0.003248	0.005810	0.559139	0.5775
LASSET	0.003581	0.002955	1.211695	0.2290
INTE	0.074624	0.209672	0.355906	0.7228
INFR	0.001716	0.073107	0.023469	0.9813
GDPG	0.000601	0.011152	0.053905	0.9571
R-squared	0.509343			
Adjusted R-squared	0.457391			
F-statistic	9.804119			
Prob(F-statistic)	0.000000			
DW	1.491363			

Source: Researchers' computation (2019) using E-views 9

Table 4.6 *Hausman Specification*

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	42.216991	9	0.0000

Source: Researchers' computation (2019) using E-views 9

4.5 Discussion

The result of the Hausman test implies that fixed effect is the appropriate model for testing the hypotheses. In the model above, liquidity as the first proxy for determinants of profitability is found to positively influence profitability, however, it was found to be insignificant. This implies that as liquidity increases, profitability also increases. This finding is in contrast with the *a priori* expectation of the study because in the banking sector, there is a tradeoff between liquidity and profitability as banks that choose to be liquid may keep substantial part of their deposit so as to fulfill short term withdrawal obligations of customers. This in return reduces the amount of loan they advance to customer and in return, income and profitability are negatively affected. This outcome is in line with the findings of (Idowu *et al*., 2017; Lartey, Antwi, and Boadi, 2013; Premalatha and Nedunchezhian, 2015 and Abdullah & Jahan, 2014). Arising from our findings, we fail to reject the null hypothesis (H_{01}) that liquidity management has no positive significant effect on profitability.

Capital adequacy ratio is found to positively and significantly influence profitability which implies that banks with sufficient capital are able to make more profit. This is so because bank will have sufficient funds to finance loan advances, invest in new technology, and increase banks ability to withstand risk, as well as increase size, which propels banks to enjoy economies of scale. Also, this enables them to withstand competition, offer better service to customers and employ better human resources. This finding is corroborated by earlier findings by (Kipruto, *et al*., 2017; Agbeja *et a*l., 2015 and Asikhia & Sokefun, 2013). We therefore reject the null hypothesis (H_{02}) that capital adequacy has no significant positive effect on profitability.

Banks listing age has been found to negatively but significantly influence profitability. This is in line with the findings of (Majumdar, 1997; Dogan, 2013 and Coad, Segarra & Teruel, 2007) who found negative associations between age and profitability but in contrast with that of Halil and Hasan, 2012; Papadogonas, 2007, and Ilaboya & Ohiokha 2016). We therefore reject the null hypotheses (H_{03}) that age has no significant negative effect on profitability.

Nonperforming loan has been found to positivelyand significantly influence profitability. This may be so as the reported profit of banks is based on accrual basis which recognizes profit when made and not when cash is received. This outcome is in line with the findings of (Kajola *et al*., 2018; Okere *et al*., 2018 and Alshatti, 2015) that established significant positive effect of nonperforming loan on the profitability of banks. Contrary to this empirical outcome is the study of (Annor and Obeng, 2017; Muriithi *et al*., 2016; Kani, 2017; Uwuigbe *et al*., 2015 and Aykut, 2016). The study therefore rejects the null hypothesis (H_{04}) of no significant positive effect of nonperforming loan on profitability.

Loan to Total Asset has been found to positively and significantly affect profitability. It implies that the proportion of liquid asset to total asset does not matter for profitability. This outcome is in line with the findings of Ani *et al.,* (2012). Null hypothesis (H_{05}) of no significant positive effect of loan total asset on profitability is hereby rejected.

The study further found that size has significant positive effect on profitability implying that larger firms are able to earn more profit. This may be due to the economies of scale enjoyed by larger firms as they are able to spread their fixed cost over large level of activity. These findings are in line with those of (Muhindi and Domnic, 2018; AlGhusin, 2015 and Rahman *et al*., (2015)that found significant and positive effect of size on

profitability. The null hypothesis (H_{06}) of no significant positive effect of size on profitability is therefore rejected.

As to the macroeconomic variables (INTE, GDPG) and INF), none has been found to individually exert significant effect on profitability. Both GDPG and INTE have positive but no significant effect on profitability, while INF exerts negative and insignificant effect on profitability. The findings imply that macroeconomic variables have no significant effect on profitability of DMBs in Nigeria. Arising from the findings, we fail to reject null hypotheses (H_{07}, H_{08} and H_{09}) of no significant positive effect of macroeconomic indicators (GDPG, INFR and INTE) on profitability of DMBs in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

This study empirically investigated the determinants of profitability of ten listed DMBs in Nigeria. The findings indicated that only banks specific variables are the significant determinants of profitability of Nigerian DMBs. Specifically, capital adequacy, age, nonperforming loan, loan to total asset and size are the factors that matter for banks profitability while the finding could not establish significant effect of all the proxies for macroeconomic variables on profitability.

Arising from the empirical outcome, the study recommends that banks' finance managers and top management should in their attempt to earn sufficient profit be aware of and properly manages and monitor their capital, age, nonperforming loan to total asset and size. Also, government should make and implement economic policies that will improve banks performance.

Finally, the study recommends that future research efforts should increase the time frame of the study by considering more years and also consider other factors that can influence profitability. Also, future studies should be conducted in other sectors or subsectors of Nigerian economy. They may include proper management of the economy in a way that will improve national output, reduce inflation, and set realistic interest rate.

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