

Bank Size and Financial performance of Deposit Money Banks in Nigeria

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Abstract

This study investigated corporate size and financial performance of deposit money banks in Nigeria for the period 2010 to 2019. The study employed ex post facto and correlational research design and the population comprised of all banks listed on the Nigerian Stock Exchange for the period under review. The sample consisted of ten (10) banks after data filtration using simple random sampling technique. The study collected data from secondary sources mostly the sampled banks financial statements and Central Bank of Nigeria Statistical Bulletin. The secondary data obtained was analysed with descriptive and inferential statistics. The inferential statistics employed multiple regression analysis (parsimonious error correction model). The result showed a positive and significant relationship between bank size and return on assets of deposit money banks in Nigeria. The paper concluded that banks size positively influences the financial performance of deposit money banks. Therefore, the paper recommended amongst others that deposit money banks in Nigeria should improve their assets and level of capitalization so as to improve their lending capability and hence financial performance.

Keywords: *Bank Size, ROA, Deposit Money Banks, Financial Performance, GDP*

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I. Introduction

Deposit money banks in any given economy play a significant role in supporting financial markets and have a substantial bearing on the success of an economy (Nzotta, 2014; Appah & Tebepah, 2018). The core function of deposit money banks is to help the movement of funds to the borrowers from the savers. Ongore and Kusa (2013) noted that deposit money banks are regarded as the main channels of allocating funds from savers to investors. This is in addition to managing financial risks and exposures. Therefore to continue with their financial intermediation functions without much interruption, deposit money banks need to be sound, stable and profitable (Onuonga 2014). Also, according to Sufian (2011), the profitability, soundness and stability of deposit money banks is critical to the well-being of a country's general economy at large due to their significant roles in capital accumulation, firms' growth and economic advancement. Deposit money banks need to conduct stress testing in order to survive future dynamics, threats and opportunities (Alex & Ngaba, 2018). The banking sector all over the world acts as the life blood of modern trade and economic development and through being a major source of finance to economy (Ongore & Kusa, 2013).

The size of a bank is relevant in relation to the profitability of banks. Almazari (2014), Teimet & Lishenga (2019) opined that the capacity to sustain profits over time remain the first bank's line of defense as it absorbs unexpected losses, strengthens banks capital base and in addition, used to improve future performance through re-investment of the retained earnings. Teimet & Lishenga (2019) bank size plays a significant role in the prediction of financial performance when economies of scale are considered. A bank may leverage on average cost reduction per unit while enhancing efficiency, capital base and market share. According to Babalola and Abiola (2013), larger bank is more influential in the strategic decision and have more influence upon its stakeholders, competitors, efficiency and in addition, more profitable relative to a small bank. Bank size uniqueness in terms of assets, capital, deposits and loans influence the quality of decisions on the activities undertaken by a bank, which in effect, affects the strength of financial performance (Olowokure, Tanko & Nyor, 2015).

The nexus between bank size and financial performance of commercial banks in Nigeria is thus, necessary. Moreover, most of the empirical studies including Demirgüç-Kunt and Huizinga (2013), Obamuyi (2013), Saira, Jamil & Abdul (2011), Hoffmann (2011), Curak, Poposki et al. (2011), Berger, Klapper & Turk-Asis (2009), Kamau and Were (2013), Onuonga (2014) and Turk-Ariss (2010); Eyigege (2018); Alex & Ngaba (2018) are mixed at best on their findings on the effect of bank size on financial performance. Hence, a further study on bank size and financial performance of deposit money banks in Nigeria will not only help in the formulation of effective policies to ensure the sustained stability of the country's banking sector but also bridge the gaps in the literature. Therefore the main objective of this paper is to investigate corporate size on the

financial performance of banks in Nigeria. To achieve the objective of this paper, the following research questions were answered in the study:

1. What is the effect of bank size on the financial performance of deposit money banks in Nigeria?
2. What is the effect of loan ratio on the financial performance of deposit money banks in Nigeria?
3. What is the effect of capital ratio on the financial performance of deposit money banks in Nigeria?
4. What is the effect of deposit ratio on the financial performance of deposit money banks in Nigeria?
5. What is the effect of capital employed on the financial performance of deposit money banks in Nigeria?
6. What is the effect of inflation on the financial performance of deposit money banks in Nigeria?
7. To what extent does gross domestic product affect the financial performance of deposit money banks in Nigeria?

The following hypotheses were tested:

Ho₁: Bank size does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₂: Loan ratio does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₃: Capital ratio does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₄: Deposit ratio does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₅: Capital employed does not have positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₆: Inflation does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

Ho₇: Gross domestic product does not have a positive and significant effect on return on assets of deposit money banks for the period 2010 to 2019 in Nigeria.

II. Literature Review

Conceptual Review

Bank Size: The size of a bank is used to capture economies and diseconomies of scale in the banking industry. The size of a bank is computed as the logarithm of total assets. Bank size plays an important role in the prediction of profitability when economies of scale are considered. A bank may leverage on average cost reduction per unit while enhancing efficiency, capital base and market share. Babalola and Abiola (2013) opined that a larger bank is more influential in the strategic decision and have more influence upon its stakeholders, competitors, efficiency and in addition, more profitable relative to a small bank. Bank size uniqueness in terms of assets, capital, deposits and loans influence the quality of decisions on the activities undertaken by a bank, which in effect, affects the strength of financial performance (Olowokure, Tanko & Nyor, 2015). The largeness of a bank can be decomposed into; vertical on activities and products; or horizontal on the supply of a product or service across several entities. Thus, a puzzled endless debate on the optimal bank size, management complexity and exposures associated with activities ranges. Larger banks engage more in market activities outside their traditional lending, which of late, has escalated and grown significantly (Teimet & Lishenga, 2019). This paradigm shift of activities in the developed world has warranted restriction to reduce bank size exposure (Vinals et al., 2013). Accordingly, larger banks tend to have lower capital base, less-stable funding, engaging in more-market based activities as well as more complex than the small banks. However, the failures associated with the larger banks tend to be more disruptive to the financial system than failures of small banks (Laeven, Ratnovski, & Tong, 2014). Muhindi & Ngaba (2018) used a panel data from 2012 to 2016 to assess the influence of bank size on the financial performance of Kenyan banks using; the number of branches, capital base, number of customer deposit, loans and advances as the key variables. The study found a positive relationship between bank size and financial performance and revealed that larger banks exhibit higher ROA relative to medium and small.

Loan Ratio: This ratio measured the liquidity risk of a bank. It arises when the bank is not able to accommodate declines in its obligations or to finance increases in loan demand. This variable is a major contributing factor of

bank performance because the market for loans particularly credit to firms and individuals is precarious and therefore holds higher expected returns than other asset portfolio for instance, government securities.

Capital Ratio: This ratio measured the total equity (total shareholders fund) to total bank assets or a ratio of capital reserves to total bank assets. It is expected that banks with high capital adequacy ratio will experience minor financial hardships during a financial crisis which will lead to higher profits. Onuonga, (2014) study of the performance of Kenyas top six commercial banks with internal factor analysis using Generalized Least Square method found out that capital adequacy had a positive impact of bank performance.

Deposit Ratio: Alex & Ngaba (2018) stated that studies have shown a relationship between deposit ratio and the financial performance of banks. According to Arsew et al (2020), banks with large total assets do have the leverage to provide credit to borrowers in sufficient quantity so as achieve better performance (Alper, et al, 2011). Kisman (2017) noted that the size of a bank's loan to deposit ratio influences the profitability of a bank. Arsew et al (2020) stated that the higher the loan deposit ratio of a bank influences the profitability of banks. Kisman (2017) further stated that loan deposit ratio significant and positively affects the return on assets of banks.

Gross Domestic Product: It refers to the value of a country's overall output of goods and services during one fiscal year at market prices excluding net income from abroad. A higher GDP is an indication of increase in purchasing power and for that matter the ability of investors increase to invest in stocks. It measures the overall health of the economy. The reason is that with economic growth, business environment is improved and barriers to entry are lowered, this leads to high competition which causes profitability reduction (Tan and Floros, 2012).

Inflation: Inflation can either be anticipated or unexpected. If it is anticipated, bank management will have a chance to adjust interest rates appropriately which enhances financial performance. An unexpected inflation causes cash flow problems to borrowers leading to abrupt abrogation of loan arrangements negatively affecting bank profitability. Pervan *et al.*, (2015) in their study of profit persistence and factors determining bank profitability in Croatia found out that inflation had a negative influence on bank performance.

Financial Performance: The financial performance of deposit money banks has critical implications for the economic growth of any given country. Appah & Inini (2019) stated that financial performance of corporations construct has two different perspectives, namely, growth and profitability, and each of these perspectives might be operationalized by using one or more indicators. Firm financial performance is commonly reflected in the calculation of financial ratios that show the link between numbers in the financial statement. The financial ratios may include the computation of the profitability, efficiency, liquidity, gearing, and investment of a particular firm. Moreover, firm financial performance generally may also be reflected in market-based (investor returns) and accounting-based (accounting returns) measures. Examples of market-based indicators to measure firm financial performance are price per share and Tobin's Q which indicate the market value or the share of the firm as well as the financial prospect of the firm in the future. Financial performance depends on various factors. Some of them are Capital Adequacy, Asset Quality, Management Efficiency, Liquidity, Gross Domestic Product etc. Therefore, in order to ensure sound financial performance banks should focus on the factors likely to affect profitability and the extent of their influence. The performance deposits money banks can be affected by internal and external factors (Al-Tamimi, 2010). These factors can be classified into bank specific (internal) and macroeconomic variables. The internal factors are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks Teimet & Lishenga (2019). The empirical results of the researches (Raza, Farhan & Akram, 2011) explained that a company, which has better efficiency, it does not mean that always it will show the better effectiveness. Alam, Raza & Akram (2011) study concludes that ranking of banks differ as the financial ratio changes. The ability to support the present and future operations of a bank depends on the quality of its earnings and profitability profile (Shar, Shah & Jamali, 2011). Kolapo & Ayeni (2012) carried out an empirical investigation into the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010). The results showed that an increase in non-performing loan and loan loss provision reduce profitability (ROA) of banks while an increase in total loan and advances lead to increase profitability. The determinants of bank performance can be put into three groups: variables that are induced by management decision and policy objectives (bank-specific factors), variables that capture the industry structure and market growth (industry-specific factors) and elements that reflect the economic atmosphere under which the bank operates (macroeconomic factors). Appah and Inini (2019) stated that financial performance of corporations construct has two different perspectives, namely, growth and profitability, and each of these perspectives might be operationalized by using one or more indicators. Profitability, for example, can be measured by variables such as return on equity (ROE), return on assets (ROA), or even the return on investments (ROI), while growth can be measured by increase in sales.

Theoretical Framework

This study was guided by different theories to explain the relationship between corporate size and financial performance. The study is anchored on the growth of firm theory and agency theory.

Growth of Firm Theory: This theory was propounded by Penrose (1959) who offered durable principles governing the growth of corporations and the rate at which corporations can grow efficiently and be profitable. Corporations with huge resources and attract the best management are expected to perform better than their peers according to the growth of the firm theory. Olawale, Bamidele & Lawal (2017) stated that in the growth theory of corporations Penrose stated that management is a team effort in which each employee deploys specialized, functional skills as well as more highly-efficient team-specific skills, which enable them to individually and collectively coordinate the many activities of the corporation in a coherent manner. Eyigege (2018) noted that Penrose provided a wider explanation of the relationship between resource-based relationship and corporate level performance. The current knowledge bases and underutilized resources of the corporation determine the direction of corporate growth. Penrose (1959) in Eyigege (2018) not only explains why and how these drivers shape the rate and direction of growth, but also argued that ignorance of these limiting factors results in inefficiencies and loss of competitive advantage. Penrose (1959) in Eyigege (2018) also provided causal relationship between resources and the generation of productive opportunities for growth and innovation. The experience of managers with each other and other resources in the corporation influences their image of the unique productive opportunities available for their corporations. Managers function as a catalyst in the conversion of firm's resources into firm capabilities and new product applications. In the spirit of dynamic capabilities, new combinations of resources lead to innovation and economic value creation (Eyigege, 2018).

Agency Theory: This theory was postulated by Berle & Means (1932) but reviewed by Jensen & Meckling (1976) to explain the agency problem inherent in modern companies. This theory of Jensen & Meckling (1976) assumes that every corporation has a form of principal-agent relationship within the walls of its structure. Jensen and Meckling (1976) defined the agency relationship as a contract under which one or more persons (the principal) engage another person (the agent) to perform some service on behalf which involves delegating some decision-making authority to the agent. The theory of agency relationship mirror the basic structure of a principal and an agent who are engaged in cooperative behaviour, but have differing goals and attitudes towards risk. The theory further assumes that principals because of information asymmetry cannot adequately observe actions that agents are taking in their benefit (Appah, 2017). According to Appah (2017), agency theory provides that managers are usually motivated by their own personal gains and work to exploit their own personal interests rather than considering shareholders' interests and maximizing shareholder value. This study anchored on the agency theory because corporate size is vital to the effective discharge of their duties, which ultimately affects the financial performance of the organization (Kajola & Onaolapo, 2017).

Previous Empirical Literature

A number of empirical studies have been done on bank size and financial performance. This section of the study provides a review of prior research and gap due of time, methodology and location.

Arsew, et al (2020) carried out a study of loan to deposit ratio, non-performing loans and capital adequacy ratio on return on assets with good corporate governance in Indonesia for the period 2014 to 2018. The study employed quantitative method and the population consisted of 45 banks and purposive sampling technique was utilized to arrive at a sample size of 10 of the best banks. The study collected data from secondary sources mostly from the published financial statements of sampled banks for the period under review. The study dependent variable was return on assets while the independent variable was loan to deposit ratio, non-performing loan, capital adequacy ratio, and the intervening variable was corporate governance perception index. The data obtained from the financial statements was analysed using diagnostic test of normality, multicollinearity, and heteroscedasticity and path analysis. The path analysis result revealed that loan deposit ratio and non-performing loan influence good corporate governance negatively and significantly while capital adequacy ratio showed a positive and significant influence. The second model suggested a positive and significant relationship between non-performing loan, capital adequacy and corporate governance on return on assets while loan deposit ratio showed no significant influence.

Teimet and Lishenga (2019) investigated the effect of banks size on the profitability of 42 commercial banks in Kenya covering the period 2009 to 2018. The regressions analysis showed the direction and magnitude of the relationships while the autoregressive distributed lag model was used to establish the equilibrium steadiness as well as the speed of adjustment to equilibrium. The results showed that banks size had a positive significant effect on returns on assets. Their study concluded that the size of a bank is associated with profitability and as such, banks consolidation and other expansion strategies enhance bank profitability as evidenced by bidirectional causality between the variables.

Edison, et al (2019) examined capital adequacy, loan to deposit ratio, operational costs and return on equity in Indonesia for the period 2014 to 2016. The study employed quantitative research method and the population consisted of 43 banks and purposive sampling method was employed to derive a sample size of 40 banks. The study obtained secondary data from the published financial statements of sample banks for the period under review. The secondary data was analysed using multiple regression analysis. The dependent variable was return on equity while the independent variable was capital adequacy ratio and loan to deposit ratio, operational costs. The results revealed a positive and significant relationship between capital adequacy ratio and loan to deposit ratio on return on equity.

Teshome, et al (2018) examined the determinants of financial performance of commercial banks in Ethiopia for the period 2007 to 2016. Their investigation employed ex post facto research design and secondary data for eight commercial banks. The data for this study was obtained from the published financial statements of the sampled commercial banks with return on asset and return on equity as theselected dependent variables while non-performing loan, capital adequacy ratio, bank size, leverageratio, credit interest income ratio, loan loss provision ratio and operation cost efficiency were theindependent variables and the data obtained were analysed with correlation and multiple linear regressionsof the panel data. The findings of the investigation revealed that capital adequacy ratio (CAR), credit interest income (CIR)and size of the bank (SIZE) have positive and statistically significant effect on financial performance whilenon-performing loans (NPLs), loan loss provision (LLP), leverage ratio (LR) and operational costefficiency (OCE) have negative and statistically significant effect on banks' financial performance.

Hapsari, (2018) conducted a study of loan to deposit ratio and non-performing loan on banking financial performance in Indonesia for the period 2012 to 2016. The study employed quantitative and descriptive research method. The population of the study consisted of 116 banks and purposive sampling method was used to obtain a sample size of 13 banks for the period under review. The dependent variable was return on assets and the independent variables were loan deposit ratio with non-performing loan while size was used as a moderation variable. The study collected data from the published financial statements of sample banks. The data collected from the sample banks were analysed with multiple regression with absolute difference method. The result from the regression analysis suggested that loan to deposit ratio showed a positive influence on return on assets; non-performing loan negatively affect return on assets while size does not moderate the effect of the relationship between loan to deposit and non-performing loan on return on assets.

Muhindi and Ngaba (2018) used a panel data from 2012 to 2016 to assess the influence of bank size on the financial performance of Kenyan banks using; the number of branches, capital base, number of customer deposit, loans and advances as the key variables. The study found a positive relationship between bank size and financial performance and revealed that larger banks exhibit higher ROA relative to medium and small. However, an earlier study by Mulwa and Kosgei (2016) found a negative relationship between bank size and financial performance, which conflict.

Eyigege (2018) analysed the influence of firm size on financial performance of banks quoted on the Nigeria Stock Exchange. The study employed ex post facto research design with secondary data obtained from the published financial statements of the five banks. The independent variable was firm size measured by log of total assets while the dependent variable was financial performance measured by return on asset. The model of the study was analysed using pooled ordinary least square regression and fixed effect/random effect regression with the aid of STATA for panel regression. Also descriptive statistics and correlation analysis were computed. The results suggest that firm size insignificantly and negatively influences financial performance of banks as a result of diseconomies of scale.

Akex and Ngaba (2018) examined firm size on financial performance of commercial banks in Kenya for the period 2012 to 2016. The study utilized descriptive survey research design and the data was collected from the published financial statements of the sampled banks. Also correlation analysis was applied in data analysis and the findings revealed that a positive association between firm size and financial performance of commercial banks in Kenya.

Kajola, et al (2017) carried out a study of corporate board size and financial performance of listed firm in Nigeria for the period 2003 to 2014 using ex post facto and correlational research designs. The study used secondary data obtained from the financial statements of sampled listed companies. The data obtained was analysed with panel regression analysis and the result suggest a positive and significant association between board size and financial performance (return on assets and return on equity) of listed non-financial firms in Nigeria.

Olawale, et al(2017) also investigated the effect of firm size on the performance of firms in Nigeria using panel data set of 12 non-financial firms operating in Nigeria in the period of 2005-2013 and analyzing the panel data using a pooled regression model, fixed effect model and random effect model to identify the relationship between firm size and the performance of firms listed on the Nigeria stock exchange. The result of

the study reveals that firm size in terms of total asset has a negative effect on performance while in terms of total sales firm size has a positive effect on performance.

Lemma and Rani (2017) analyzed the determinants of financial performance of commercial banks in Ethiopia data from two public and seven private banks for the years that were considered for the study. Return on assets was used as proxies of financial performance while the internal and external factors were considered to analyze the factors. Descriptive, correlation and regression analysis were used to analyze the data and the findings revealed that liquidity and earnings ratio have positive relation with return on assets. The findings further revealed that CAR, the ratio of non-performing loan to total loans, and industry growth has negative relation with profitability.

Abel and Roux (2016) evaluated the relationships among efficiency, bank size and performance of banks in Zimbabwe between 2009 and 2014. The study found that efficiency relates positively to financial performance and economic stability. The study suggested that an increase in economic activities increases the demand for financial services, which increases efficiency. Gemechu (2016) also researched on determinants of profitability of bank industry in Ethiopia for the years 2002 to 2012 using return on assets and net interest margin as measure of performance. The finding revealed that loan to advances, efficiency and productivity, have positive effect on both return on assets and net interest margin. Liquidity risk and exchange rate have positive effect on return on assets but have no effect on net interest margin.

Isik and Ince (2016) carried out a study of board size and board composition on performance of 30 commercial banks for the period 2008 to 2012 in Turkey. The study employed ex post facto and correlational research design. Secondary sources of data collection were employed from the sampled banks and panel regression analysis was used for data analysis. The independent variable used was bank size with several control variables such as credit risk, liquidity risk, net interest margin and non-interest income while the dependent variables include return on assets, and operating return on asset. The panel fixed effects regression result revealed that board size has a significant positive effect on bank's performance (return on assets and operating return on assets).

Munyradadzi and Nirupa (2016) investigated the effect of board composition and board size on financial performance of companies listed on the Johannesburg stock exchange in South Africa. The study employed ex post facto research design and correlational research design. The data for the study was collected from the financial statements obtained from the sampled companies. Panel multiple regression analysis was applied for the purpose of data analysis. The empirical result suggests that board size is not significantly associated with Tobin's Q and ROE (performance measures) while board size is found to be positively associated with return on assets (ROA).

Using panel data analysis, Pervan, et al (2015) studied profit persistence and factors determining bank profitability in Croatia within the period 2002 to 2010 and realized a positive and significant association between bank size and profitability. Total assets were log transformed to capture bank size and applied the GMM estimation technique. Their results postulate that banks should make use of their size to exploit cost advantages whose realization together with improved management would contribute to further increases in efficiency which would result into higher profitability.

Onuonuga (2014) that investigated the impact of the internal bank specific factors on the profitability of the top six commercial banks in Kenya over a six year period as from 2008-2013. The generalized least square method was used to estimate the impact of bank assets, capital, loans, deposits and asset quality on banks profitability. The paper used return on assets (ROA) as a measure of profitability. The findings revealed that bank assets, capital strength, ownership, operations expenses and diversification do significantly influence profitability of the sampled banks. Similarly, Kamau and Were (2013) carried out a study on the factors behind the impressive banking sector performance in Kenya between 1997-2011. The study made use of structure conduct (SCP) literature that postulates that structure and efficiency play a role in determining performance measured by log of net interest margin (NIM) and the log profit before tax. Data envelopment analysis (DEA) was used to derive both the scale and technical efficiency scores. The efficiency scores were then incorporated into the main equation to test the four hypotheses in SCP literature. The results suggested that the source of superior performance in the Kenyan banking sector is structure/collusive power and not efficiency hence supporting SCP hypothesis. Among the control variables, the study found bank size to have a significant positive relationship with performance.

Akinyomi and Olagunju (2013) examined the effect of firm size on the profitability of Nigerian manufacturing sector. Panel data set over the period of 2005 to 2012 was obtained from the audited annual reports of the selected manufacturing firms listed in the stock exchange. Return on asset was the proxy for profitability while log of total assets and log of turnover were used as proxies for firm size. The results of the study revealed that the firm size both in terms of total assets and in terms of total sales has a positive effect on the profitability of Nigerian manufacturing companies.

Obamuyi (2013) investigated the effects of bank capital, bank size, expense management, interest income and the economic condition on banks' profitability in Nigeria as measured by the banks' return on assets (ROA). The fixed effects regression model was employed on a panel data obtained from the financial statements of 20 banks as from 2006 to 2012. The results indicate that improved bank capital and interest income, as well as efficient expenses management and favourable economic condition, contribute to higher banks' performance in Nigeria. Nonetheless, the relationship between bank size and profitability was found to be negative but statistically significant.

In addition, Curak, et al (2011) analyzed the bank-specific, industry-specific and macroeconomic determinants of bank profitability. Dynamic panel analysis was applied on the sample of 16 banks in the Macedonian banking system in the period between 2005 and 2010. Their results revealed that operating expense, solvency risk, GDP, concentration, and liquidity risk are significantly related to bank profitability, whereas, both bank size and loan to asset ratio had statistically, insignificant negative effect.

Goddard, et al(2008) used panel data from US credit union covering 993 to 2004 to evaluate the influence of bank size on performance. The research found that a positive indirect exposure effect for large banks outweighed the negative direct exposure effects and found evidence that the relationship between performance and bank size positively correlates with performance through economies of scale and scope. Compared to small banks, large banks tend to have a larger market share because of better bargaining power, superior financing position, and more efficient cost control, thus, larger banks report higher returns.

Lepetit, et al (2008) used a data set from 734 banks for the period between 1996 and 2002. In consideration of banks size effect, they found a positive link with the financial performance for smaller banks. However, they suggested that a larger share of trading activities might not be associated with higher performance for smaller banks, but in some cases.

III. Methodology

Research Design: This study employed ex post facto research design and correlational research design. This is because ex post facto research design is a systematic empirical inquiry in which the scientist does not have direct control of independent variables because they are inherently not manipulated (Appah, 2020). Egbunike and Abiahu (2017) stated that a correlational research design is the measurement of two or more factors to determine or estimate the extent to which the values for the factors are related or change in an identifiable pattern.

Population and Sample of the Study: The population of the study is made up of banks quoted on the Nigerian Stock Exchange as shown on the Nigerian Stock Exchange Factbook for the year 2011 - 2019. The banks are Access Bank Plc, Diamond Bank Plc, Ecobank Transnational Incorporation, First City Monument Bank, Fidelity Bank Plc, First Bank Plc, Guaranty Trust Bank Plc, Skye Bank Plc, Stanbic IBTC, Sterling Bank Plc, United Bank for Africa Plc, Union Bank Nigeria Plc, Unity Bank Plc, Wema Bank Plc and Zenith Bank Plc. This therefore constitutes a finite population, from which the sampling frame is built. Therefore, the sample size of this study is made up of ten banks (First Bank Plc, Guaranty Trust Bank Plc, United Bank for Africa Plc, Union Bank Nigeria Plc, Zenith Bank Plc, First City Monument Bank, Fidelity Bank Plc, Unity Bank Plc, Wema Bank Plc & Access Bank) which were purposively selected on the availability of data during the years 2010 to 2019.

Source of Data Collection and Analysis Technique: The investigation employed secondary sources of data collection mainly from the published audited financial statements of each bank obtained from their website and the Central Bank of Nigeria Statistical Bulletin for the study period to analyse the effect of the independent variables on the dependent variables. The collected data were analyzed using descriptive statistics, diagnostic tests and multiple linear regression analysis of panel data for the years 2010 to 2019.

Variables of the Study: The study employed dependent, independent and control variables. The dependent variable consists of return on assets (ROA) while the independent variable and control variables consists of bank size, loan ratio, capital ratio, deposit ratio, gross domestic product, and inflation. The variables were measured as follows:

Table 1: Measurement of Variables

Variables	Symbol	Measurement	Source
Return on Assets	ROA	Ratio of profit after tax to total assets	Odundo & Orwaru, (2018); Kajola & Onaolapo, (2017); Onuonga (2014), Obamuyi (2013)
Bank Size	BNS	Logarithm of total assets	Odundo & Orwaru, (2018); Turk-Ariss (2010) and Onuonga (2014),
Loan Ratio	LOR	Ratio of loans to total assets	Odundo & Orwaru, (2018); and Onuonga (2014)
Capital Ratio	CAR	Ratio of equity to total assets	Odundo & Orwaru, (2018)
Deposit Ratio	DPR	Ratio of bank deposit to total assets	Odundo & Orwaru, (2018)
Interest Rate	INR	Yearly interest rate	Tam, Trang & Nanh (2017)

Gross Domestic product	GDP	Yearly GDP of the Nigeria	Gautam (2018); Melaku (2016)
Inflation	INF	Yearly rate of inflation	Tomulasa, & Cocris, (2014)

Source: Several Researchers

Model Specification: Gujarati & Porter, (2009) stated that model specification is the determination of the endogenous and exogenous variables to be included in the model as well as the a priori expectation about the sign and the size of the parameters of the function. The following models were developed based on the study variables:

$$\sum ROA = \beta_0 + \beta_1 \sum BNS_{1it} + \beta_2 \sum LOR_{2it} + \beta_3 \sum CAR_{3it} + \beta_4 \sum DPR_{4it} + \beta_5 \sum INR_{5it} + \beta_6 \sum GDP_{6it} + \beta_7 \sum INF_{7it} + \epsilon \dots \dots (1)$$

$\beta_1 - \beta_7$ are the coefficients of the regression, while ϵ is the error term capturing other explanatory variables not explicitly included in the model.

IV. Results and discussions

Table 1: Descriptive Statistics

	ROA	BNS	LOR	CAR	DPR	CAP	GDP	INF
Mean	44.05744	297323.6	167299.3	855156.2	181814.9	214378.3	106177.4	63291.23
Median	43.00000	46200.00	59416.00	164300.0	87900.00	47100.00	39882.60	15218.08
Maximum	56.00000	1836473.	634857.7	3201000.	817264.0	802965.0	465301.2	296442.8
Minimum	36.20000	403.0000	3.900000	3746.900	1616.000	4100.000	155.8100	41.31000
Std. Dev.	5.302811	456214.4	230267.8	1036659.	216390.3	274203.6	144249.5	89837.61
Skewness	0.608795	1.620364	1.083766	0.880801	1.289587	1.035277	1.224701	1.287664
Kurtosis	2.517312	4.883309	2.373760	2.394594	3.973720	2.512042	2.985487	3.220099
Jarque-Bera	2.787708	22.82991	8.271847	5.638357	12.35044	7.353609	9.749647	10.85623
Probability	0.248117	0.000011	0.015988	0.059655	0.002080	0.025304	0.007636	0.004391
Observations	100	100	100	100	100	100	100	100

Source: Author's computation using e-views, 2020

Table 1 shows the descriptive statistics of the variables included in the model. The descriptive statistics was carried out for the variables involved in our model from 2010 to 2019. It shows that the mean value of ROA, BNS, LOR, CAR, DPR, CAP, GDP and INF as 44.05744, 297323.6, 167299.3, 855156.2, 181814.9, 214378.3, 106177.4 and 63291.23 respectively. The standard deviation of ROA, BNS, LOR, CAR, DPR, CAP, GDP and INF from their respective long-term mean values every year point at 5.302811, 456214.4, 230267.8, 1036659, 216390.3, 274203.6, 144249.5 and 89837.61 respectively. The probability value of Jarque-Bera statistics for all variables shows their distribution level at mean zero and constant variance. It suggested that the variables in the model were normally distributed. The variables are positively skewed.

Table 2: Augmented Dickey Fuller Unit Root Test

Variables	Level	1 st Difference	Order of Integration
ROA	-0.369255	-2.352215	I(1)
BNS	1.031225	-6.219344	I(1)
LOR	-0.289652	-6.335816	I(1)
CAR	-0.793137	-6.533519	I(1)
DPR	-0.842407	-6.066187	I(1)
INR	-0.947537	-8.430607	I(1)
GDP	-1.800958	-7.803040	I(1)
INF	-1.341944	-10.17095	I(1)

Critical Value @ 5% **-1.950117**

Source: Author's Computation using e-views, 2020

Table 2 reveals the Augmented Dickey Fuller Unit Root test for variables stationarity. The variables in the model were integrated variables; which explains that all the variables attained stationarity after first difference. The null hypothesis of non-stationarity of the variables in the model is rejected after differencing at 5 percent level of significance.

Table 3: Johansen Co-Integration Test

Date: 01/10/21 Time: 15:01
 Sample (adjusted): 2010 2019
 Included observations: 98 after adjustments
 Trend assumption: Linear deterministic trend
 Series: ROA, BNS, LOR, CAR, DPR, CAP, GDP, INF
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.803178	203.7560	159.5297	0.0000
At most 1 *	0.691603	143.6142	125.6154	0.0025
At most 2 *	0.562423	100.0886	95.75366	0.0243
At most 3	0.498807	69.50800	69.81889	0.0529
At most 4	0.394768	43.94972	47.85613	0.1110
At most 5	0.348465	25.37043	29.79707	0.1486
At most 6	0.207844	9.518737	15.49471	0.3196
At most 7	0.023974	0.897836	3.841466	0.3434

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using e-views, 2020

Table 3 shows the Johansen Co-Integration Test. The co-integration result reveals three co-integrating equation at 5 percent significance level. This means that, there is the probability of a long run equilibrium relationship among the variables in the model. Thus, the error correction model can be run, to ascertain the long run relationship.

Table 4: Parsimonious Error Correction Model

Dependent Variable: ROA
 Method: Least Squares
 Sample (adjusted): 2010 2019
 Included observations: 98 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.393119	0.989719	2.417979	0.0298
BNS	0.018850	0.008131	2.320129	0.0035
LOR	0.175768	0.068563	2.563585	0.0225
CAR	0.044113	0.022848	1.930691	0.0740
DPR	0.014304	0.031192	0.458589	0.6536
INR	0.108077	0.044390	2.434715	0.0482
GDP	0.217622	0.104271	2.087080	0.0350
INF	-0.250210	0.082010	-1.875175	0.2312
R-squared	0.733296	Mean dependent var		3.793326
Adjusted R-squared	0.733241	S.D. dependent var		0.110052
S.E. of regression	0.044941	Akaike info criterion		-3.089167
Sum squared resid	0.028276	Schwarz criterion		-2.121461
Log likelihood	77.60501	Hannan-Quinn criter.		-2.751412
F-statistic	9.327801	Durbin-Watson stat		2.216152
Prob(F-statistic)	0.000050			

Source: Author's computation using e-views, 2020

Table 4 shows the error correction results between ROA (proxy for corporate financial performance) and BNS, LOR, CAR, DPR, INR, GDP, INF (proxy independent and control variables).

The first hypothesis of the relationship between bank size and return on assets revealed a positive and significant association between bank size (natural logarithm of total assets) and financial performance (return on assets) of deposit money banks in Nigeria for the period under review. This result is consistent with the findings of Teshome, et al (2018); Kamau and Were (2013) and Onuonga (2014) that the size of a bank positively and significantly affects the financial performance of deposit money banks. However, several other studies revealed a contrary results Eyigege (2018); Tam, Trang and Nanh (2017), Obamuyi (2013), Saira, Jamil, Khalid and Abdul, (2011) and Hoffmann (2011) found a negative and significant relationship between bank size and profitability. Curak, Poposki and Pepur (2011) study found a negative and insignificant relationship between bank size and profitability while Turk-Ariss (2010) found a positive and insignificant association between bank size and financial performance of deposit money banks.

The second hypothesis of the relationship between loan ratio and return on assets revealed a positive and significant association between loan ratio and return on assets. This result is in line with Odundo and Orwaru (2018), Onuonga (2014), Hoffmann (2011), Turk-Ariss (2010) that loan ratio of deposit money banks positively and significantly affects the corporate financial performance (return on assets) of companies. On the other hand, Curak, Poposki and Pepur (2011), Saira, Jamil, Khalid and Abdul, (2011) found a negative effects between loan ratio and corporate financial performance (return on assets) of banks.

The third hypothesis of the relationship between capital ratio and return on assets revealed a positive and significant association between capital ratio and return on assets. This result is in tandem with the findings of Odundo and Orwaru (2018), Onuonga (2014), Obamuyi (2013) and Saira, Jamil, Khalid and Abdul (2011) that the capital ratio of banks positively and significantly affects the financial performance of banks. On the other hand, Hoffmann (2011) study revealed a negative and significant relationship between capital ratio and return on assets of deposit money banks.

The fourth hypothesis of the relationship between deposit ratio and return on assets revealed a positive and significant association between deposit ratio and return on assets. This result is in line with Odundo and Orwaru (2018), Saira, Jamil, Khalid and Abdul (2011) that deposit ratio positively and significantly affect the financial performance of deposit money banks. On the other hand the result of Hoffmann (2011) suggested a negative and significant association between deposit ratio and financial performance of banks.

The fifth hypothesis of the relationship between interest rate and return on assets revealed a positive and significant association between interest rate and return on assets. This result is consistent with the findings of Tam, Trang and Nanh (2017) that interest rate positively and significantly affects the financial performance of deposit money banks. This is due to the fact of deposit money banks in Nigeria charge a higher rate of interest on loans and advances because of their perceived risk of doing business than paying deposit interest rates to depositors. The higher interest rates benefit the banks in terms of better financial performance but at the expense of the overall economy of the country.

The sixth hypothesis of the relationship between gross domestic product and return on assets revealed a positive and significant association between gross domestic product and return on assets. This result is in agreement with Guatam (2018), Tam, Trang and Nanh (2017) that gross domestic product positively and significantly affects the financial performance of deposit money banks. The positive effect suggests that higher gross domestic product represents improved business opportunities, which ultimately leads to higher performance deposit money banks in Nigeria for the period 2010 to 2019.

The seventh hypothesis of the relationship between inflation rate and return on assets revealed a negative and insignificant association between inflation rate and return on assets of deposit money banks in Nigeria. This result is in tandem with the findings of Naceur and Kandil (2009) that the inflation rate negatively influences financial performance of deposit money banks. On the other hand, Claeys and Vander Vennet (2008), Garcia-Herrerro et al. (2009), found a positive and significant relationship between inflation rate and financial performance of banks.

V. Conclusion, Implication and Recommendations

This study investigated the effects of bank size on financial performance of deposit money banks in Nigeria. The study reviewed several prior empirical studies on bank size and bank profitability and the study anchored on agency theory and growth of firm theory. The secondary data obtained from the published financial statements of sample banks revealed that there is a positive and significant relationship between bank size and the financial performance of banks; positive and significant relationship between loan ratio and return on assets; positive and significant relationship between capital ratio and return on assets; positive and significant relationship between deposit ratio and return on assets; positive and significant relationship between interest rate and return on assets; positive and significant relationship between gross domestic product and return on assets and negative and insignificant relationship between inflation and return on assets. Hence, the paper concluded that the size of a bank positively influence banks' profitability. The implication of this study influences the theoretical, policy and managerial policies for the effective and efficient management of banks for better

performance. Consequently, the paper recommends that: deposit money banks in Nigeria should improve their assets and level of capitalization so as to improve their lending capability and hence financial performance; deposit money banks in Nigeria should minimize their operational cost efficiency and gearing ratio because excess expenditure does have negative and significant impact on banks performance; deposit money banks should leverage on information technology as a means of cost reduction and hence profit improvement; deposit money banks in Nigeria are advised to minimize their non-performing loans through appropriate credit policies and procedures and deposit money banks in Nigeria should consider other quantitative and qualitative approaches of profit improvement than bank size.

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