Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Nigeria

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Abstract

The study examines the bank-specific and macroeconomic determinants of banks profitability in Nigeria analyzing audited financial reports of selected sixteen (16) commercial banks over the period of 2010 to 2015 making up to 96 observations. The study identified that existing studies are sketchy in developing economies even though many studies have emerge in developed economies. The bank profitability is measured by return on assets and return on equity as function of bank-specific and macroeconomic determinants. Using the balanced panel data set, the empirical results of the study shows that capital adequacy and liquidity have a positive and significant effect on bank profitability. However, efficiency ratio have a negative and significant effect on bank profitability. With regards to macroeconomic variable, GDP growth also have a positive and significant impact on banks profitability. The empirical results of the study suggested that banks can improve their profitability through increasing capital and liquidity, decreasing operating cost with conscious effort to maintain transparency in their operations. In addition, a good economic environment for financial institutions foster increase in bank profitability. Hence, the study recommends that further studies can expand the scope while extending to other industries as well.

Key Words: *Bank-specific, Macroeconomic, Commercial bank, Profitability, financial institutions.*

JEL classification: *C3; G2; G3*

Introduction

In the last few years, various literatures have revealed that there is still no clear consensus whether the determinants of profitability of commercial banks are banks specific and or macroeconomic driven in Nigeria as studies in this extent are really sketchy. Even though it has been measured and conceptualized in many different ways, mostly in developed economies, the link still remains a challenging construct in emerging economies. In other words, there have been several presentations in different fora, these are largely theoretical and not empirical. Hence, this study aims to investigate the profitability determinants in Nigerian banking sector.

The commercial banks are the most dynamic financial intermediaries who perform crucial financial functions in diverse economies of the world; they engage in risk transfer, deals with complex financial instruments and markets, provide market transparency, offer a payment mechanism in its operations, match supply and demand in financial markets and also perform risk management functions. Despite the fact that new avenues for commercial banks have opened up, especially in product development, market penetration strategy and provision of bundles of different services, they have also brought with it new risks as well, which banks are expected to manage and overcome (Kenny, Jumoke, & Faderera, 2014).

The efficiency of financial intermediation can also affect the economic growth of any country and its long-term sustainability, because as financial intermediaries with complex functions, banks play a crucial role in the operation of most economies. Besides, any economies that have a versatile banking sector are better able to withstand negative shocks and contribute to the stability of the financial system, and hence, insolvencies of banks can result in a systemic crisis (Athanasoglou, Brissimis, & Delis, 2008). Therefore, it is imperative to understand the determinants of profitability in the banking sector.

The Nigerian banking system has traditionally undergo various reforms in the past few decades including the era of universal banking system that legally authorizes commercial banks to service various kinds of activities in financial markets. Most of the transactions and activities in the money and capital markets are carried out by banks, and the banking sector is one of the most vital mechanism to finance economic growth in Nigeria.

The commercial banks in Nigeria became more exposed to different kinds of risks particularly as a result of remarkable change over the years with respect to the number of institutions, ownership structure and control, and the degree of operations (Olalere and Wan, 2016). The deregulation of the financial sector influences the changes in the sector, which ushered in numerous opportunities (Olusanmi, Uwuigbe, & Uwuigbe, 2015; Suleiman & Abdullahi, 2011). Consequently, the technological advancement, adoption of regulatory guidelines and the globalization of operation in the sector that conforms to international standard are the far-reaching change that also influences changes in the sector. As a result of various financial risks, bank crisis and failures in 2005 and 2011 occurred and they showed the important of risk management in financial institutions and the businesses in the real sector.

As macroeconomic environment changes, profitability determinants of banking sector might also change as well. This paper attempts to examine the determinants of the profitability of commercial banks over the period 2010-2015, in Nigeria.

Literature Review

The concept of profitability determinants

Early studies on bank profitability were provided by (Short, 1979 & Bourke, 1989), and more recently by Alper and Anbar (2011). Then, in order to identify the determinants of bank profitability, copious empirical studies were held. Even in most recent literature, the determinant of bank financial performance is defined as a function of internal and external determinants. The internal determinants are often related to bank management and termed micro or bank specific determinants of profitability (Gungor, 2007). The external determinants are often reflecting the economic and legal environment that affects the operations and performance of banks. With regards to the nature and purpose of each study, different variables could be

employed. Among the internal determinants, there are bank specific financial ratios representing capital adequacy, cost efficiency, liquidity, asset quality, and size. The ownership, market interest rates, inflation and economic growth are mostly the external determinants that affect bank financial performance.

In literature, few empirical studies on the determinants of banks profitability have focused on a specific country, while others have concentrated on a panel of countries. For instance, the studies that aimed at explaining bank profitability in a single country include the United States (Berger, 1995; Angbazo, 1997), Columbia (Barajas et al., 1999), Malaysia (Guru, Staunton and Balashanmugam, 2002), Brazil (Afanasieff et al., 2002), Greece (Mamatzakis and Ramoundos, 2003; Kosmidou, 2006), Tunisia (Naceur, 2003), India (Badola and Verma, 2006), China (Heffernan and Fu, 2008), Taiwan (Ramlall, 2009), Switzerland (Dietrich and Wanzenried, 2009), Pakistan (Javaid, Anwar, Zaman and Gafoor, 2011), Japan (Lui and Wilson, 2010), and Korea (Sufian, 2011). However, to lesser extent, empirical studies in Nigeria are sketchy and not much study have examined the determinants of banks performance.

One of the earliest study by Berger (1995) investigates the relationship between the return on equity and the capital asset ratio for a sample of US banks for a the 1983-1992 time period and find positive relationship between two variables. Also, Angbazo (1997) examines net interest margin for a sample of US banks for the 1989-2003 time period and find that management efficiency, default risk, opportunity cost of non-interest bearing reserves and leverage are positively associated with bank interest margin.

In the case of Colombian, Barajas et al. (1999) examines the effects of financial liberalization on banks' interest margin. After liberalization, it is found that loan quality increased and overall spread has not declined, the relevance of the different factors behind the bank spreads are affected by such measures. Furthermore, Guru et al. (2002) studies on a sample of seventeen commercial bank 1986-1995 time period in Malaysia. In this study, it is found that efficient expenses management is one of the most significant in explaining high bank profitability, high interest ratio is associated with low bank profitability and inflation is found to have positive effect on bank performance.

The study of Mamatzakis and Remoundos (2003) show that the key variables that are directly related to the strategic planning of the banks (i.e. personnel expenses, loans to assets ratio, equity to assets ratio) are the ones that mainly explain profitability. They reported that economies of scale play a significant role in the market, and has a positive impact on profitability. In the study, Mamatzakis and Remoundos also find that the size of the market, an external variable, defined by the supply of money, significantly influences profitability.

Also, Afanasieff et al. (2002) examines the determinants of banks interest spreads using macro and micro variables in Brazil and find that macroeconomic variables have the most impact on bank interest spread in Brazil. Naceur (2003) investigates the impact of banks characteristics, final structure and macroeconomic indicators on bank's net interest margin and profitability in Tunisian Banking Industry for the 1983-2000 period. High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital, and with large overheads. Naceur finds that inflation and growth rates have negative and stock market development has positive impact on profitability and net interest margin.

The research in Switzerland, Dietrich and Wanzenried (2009) find that significant differences in profitability between commercial banks and these differences can to a large extent be explained by the factors included in analysis. It is found that, better capitalized bank seem to be more profitable. Also, in case that a bank's loan volume is growing faster than the market, the impact on bank profitability is positive. They find that banks with a higher interest income share are less profitable. The most important factors are the GDP growth variable, which affects the bank profitability positively, and the effective tax rate and the market concentration rate, which both have a significantly negative impact on bank profitability in Switzerland.

In Pakistan case, Javaid et al. (2011) find that higher total assets may not necessarily lead to higher profits due to the diseconomies of scale and higher loans contribute towards profitability but their impact is not significant. Also it is found that equity and deposits have significant impact on profitability.

Some other studies have also aimed at analyzing bank profitability in groups of countries, such as Molyneux & Thorton (1992), Demirguc-Kunt and Huizinga (1999, 2001), Abreu & Mendes (2001), Bashir

(2000), Hassan and Bashir (2003), Athanasoglou, Delis and Stakouras (2006).Most importantly, the study of Molyneux and Thorton (1992) were the first to investigate a multi-country setting by examining the determinants of bank profitability for a panel of 18 European countries for the 1986-1989 time period. It is found that significant positive association between the return on equity and the level of interest rates in each country, bank concentration and government ownership.

The study of Demirguc-Kunt and Huizinga (1999) also examine the determinants of bank profit and net interest margins, using a comprehensive set of bank specific characteristics, as well as macroeconomic conditions, taxation, regulations, financial structure and legal indicators for 80 countries, both developed and developing, in the 1988-1995 period. It is found that foreign banks have higher profitability than domestic banks in developing countries, while the opposite holds in developed countries. Nevertheless, their overall results show that there is a positive relationship between the capital ratio and financial performance.The study is followed by Abreu and Mendes (2001), and examines the determinants of bank's interest margins and profitability for some European countries. It is found that well-capitalized banks have lower expected bankruptcy costs and better profitability.In the other multi-country studies, Bashir (2000), Hassan and Bashir (2003) examine the determinants of Islamic banks' performance. Bashir (2000) reports that higher leverage and large loans to asset ratios. It is found that taxation has negative, macroeconomic setting and stock market development have positive impact on banks profitability.

Hassan and Bashir (2003) investigate profitability for a sample of Islamic banks from 21 countries. They show that a higher loan ratio actually impacts profits negatively. Athanasoglou, Delis and Stakouras (2006) have analyzed the effect of selected set of determinants on banks profitability in the South Eastern European region over 1998-2002 period. It is found that concentration is positively correlated with bank profitability and inflation has a strong effect on profitability while bank's profits are not significantly affected by real GDP per capita fluctuations. In the literature on determinants of banks profitability in Turkey, there are some studies. According to the study by Kaya (2002), equity to assets affects ROA ratio positively while it affects ROE negatively. Furthermore, real interest rate, ratio of securities to total assets, share of the bank in total assets of the sector and open foreign currency position have positive impact on ROE while budget deficit of the public sector and ratios of credits and liquid assets to total assets affect both ROA and ROE positively. On the other hand, net non-performing loans affects ROA negatively while ratios of staff expenditures and deposits to total assets affect both ROA and ROE negatively.

In the same vein, the study of Tunay and Silpar (2006) investigates profitability of the Turkish banking sector in the period of 1988-2004. It is found that the ratios of equity, non-interest expenditures to total assets, national income and concentration ratio have positive impact on ROE and that the ratio of deposits to stock market capitalization have negative impact on both ROE and ROA.

Atasoy (2007) examines profitability determinants and expenditure-income structure of Turkish banking sector between 1990 and 2005. Atasoy determines that ROA is affected positively by the ratio of equity and total assets and inflation rate positively and negatively by concentration ratio in the banking sector, ratio of banking sector asset size to national income and ratios of fixed assets and special provisional costs to total assets.

Sayilgan and Yildirim (2009) investigates the relationship between the return on assets and the return on equity ratio for a sample of Turkish banks for the 2002-2007 time period using monthly data. The profitability of the banking sector seems to have increased along with declining inflation rate, consistently increasing industrial production index and improving budget balance. It is found that profitability positively affected by capital adequacy and negatively by growing off-balance sheet assets.

The results of the studies differ significantly due to the variation of the environment and data included in the analysis. However, there are common factors influencing profitability identified by several researchers. Summarizing the results from numerous studies, various measures of costs are generally negatively correlated with profits. Larger bank size, greater dependence upon loans for revenue, higher market concentration, greater GDP growth and higher proportion of equity capital to asset have generally been associated with greater profitability. Higher liquidity, greater provisions for loan losses and more reliance on debt have been lower indicative of lower bank profits (Olson and Zoubi, 2011).

Methodology

Variables

The empirical study analyzes the determinant of commercial bank profitability which includes ten variables namely the dependent and the explanatory variables. The independent variables are categorized into bank-specific and macroeconomic determinants of bank profitability.

Dependent Variables

Typically, banks profitability are measured by return on assets (ROA), return of equity (ROE), and the net interest margin (NIM). ROA is defined by the net income divided by total assets and is often expressed in percent. ROE is the internal performance of shareholders value, and it is the most popular measure of performance. ROE is net income divided average total equity. However, NIM is a performance metric that examines the success of a firm's investment decision as contrasted to its debt situations (Olalere and Wan, 2016). NIM is the net interest income divided average interest earning assets.

Therefore, in this study, we use two measures of banks profitability: return on assets (ROA) and return on equity (ROE). Return on assets (ROA) is one of the general measure of banks profitability which often reflects the ability of banks to achieve return on its sources of fund to generate profits. The second measure ROE is also expressed in percent which reflects how firms utilize its shareholder's wealth to generate revenue (Olalere and Wan, 2016).

Bank-Specific Independent Variables

The bank specific determinants as internal factors are determined by the decisions of banks management and policy objectives, such as asset size, capital adequacy, asset quality, liquidity, efficiency, bank ownership, deposits and income-expenditure structure. This study will use the following eight bank-specific variables as internal determinants of bank profitability:

Asset size: Mostly in finance literature, total assets of the banks are often used as a proxy for banks size. It is represented by the natural logarithm of total asset (log A). The effect of bank size on profitability is generally expected to be positive (Smirlock, 1985).

Capital adequacy: One of the basic ratio for capital strength is the ratio of equity to total assets (CA). It is expected that the higher this ratio, the lower the need for external funding and then higher the profitability of the bank. Usually, it shows that the bank has the ability to absorb losses and handle risk exposure with shareholder. The equity to total assets ratio is expected to have a positive relationship with financial performance that a well-capitalized bank face a lower costs of going bankrupt which reduces their costs of funding and risks (Berger, 1995; Bourke, 1989; Hassan and Bashir, 2003; Alper and Anbar, 2011).

Asset quality: With respect to asset quality, the study will use the loan to total assets (LA) ratio. Loans to total assets ratio is a measure of income source of banks and it is expected to affect profitability positively unless bank takes on unacceptable level of risk (Alper and Anbar, 2011). The higher the ratio, the poorer the asset quality and therefore the higher the risk of the loan portfolio will be.

Liquidity: The ratio of liquid assets to total assets (LQD) is used in this study as a measure of liquidity. The higher this percentage the more liquid the bank is. Thus, one of the major causes of banks failures is insufficient liquidity. However, there is an opportunity cost of higher return while holding liquid assets. The study of Bourke (1989) finds a positive significant link between bank liquidity and profitability. Therefore, banks often mitigate risk during times of instability by choosing to increase their cash holding. Unlike the study of Bourke (1989), Molyneux and Thorton (1992) come to a conclusion that a negative correlation exist between liquidity and profitability.

Deposits: The major source of banks funding are the deposits, and are often the lowest cost of funds. The more deposits are transformed into loans, the higher the interest margin and profit. Therefore, deposits have a positive impact on profitability of the banks.

Efficiency: This ratio indicates how successfully banks manage internally their assets and liabilities in hedging against their risk dimensions. In this study, total operating expense to total assets will be used to measure the efficiency of the banks.

Income-expenditure structure: In this study, the ratio of net interest income to total assets will be used regarding the income-expenditure structure. The net interest margin measures a bank's net interest spread, and it focused on the profit earned on interest activities which is an important measure of bank efficiency.

Macroeconomic Independent Variables

Usually, banks profitability is expected to be sensitive to the macroeconomic variable and the common macroeconomic variables used in the literature in terms of external determinants are: Annual real gross domestic product growth rate (GDP), annual inflation rate (INF) and the real interest rate (RI). The economic activities (GDP) in Nigeria has dwindle most recently which is expected to affect the performance various sectors such as the banking sector. Therefore, this study only look into how the downward trend of GDP growth affects the profitability of commercial banks.

Annual real GDP growth rate: The annual GDP growth rate is a measure of the total economic activity and it often adjusted for inflation. It is expected to have an impact on numerous factors related to the demand and supply for banks deposits and loans. According to the literature on the associated between economic growth and financial sector profitability, GDP growth is expected to have positive relationship on bank profitability (Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Alper and Anbar, 2011). Therefore, in the context of this study, we expect a positive relationship between bank profitability and GDP.

Data and Research Method

This study observed the sample of balanced panel dataset of 16 commercial banks over the period of 2010 – 2015 consisting of 96 observations. The commercial banks whose shares are traded in the Nigerian Stock Exchange (NSE) from 2010 – 2015 are included in the study due to the bank-specific variables for the banks in the entire period. The bank-specific variables are derived from the annual financial report and balance sheet of commercial banks. Therefore, the financial statement data is collected from the websites of the banks and Nigerian Deposit Insurance Corporation. With regards to the macroeconomic variables, the data of economic growth is obtained from the Nigerian Bureau of Statistics and the World Bank economic database. To examine the determinants of banks profitability, this study use panel data. Panel data or longitudinal data often comprises of both time series and cross-sectional elements. Usually, in panel data models, the data set consist of n cross-sectional units, denoted i = 1….N, observed at each of T time periods, t = 1….T. Therefore, the total observation is n*T in the data set. Hence, the basic framework for the panel data is defined with respect to the following regression model (Brooks, 2008).

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \qquad \dots . (1)$$

Where y is the dependent variable, α is the intercept term, β is the coefficient of explanatory variables, and x represents the independent variable where i is the cross-sectional unit, t is the time period and μ is the error term of the model. Panel data models are usually estimated using either fixed effects or random effects models. In the fixed effects model, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables. The rationale behind random effects model is that, unlike the fixed effects model, the individual specific effect is a random variable that is uncorrelated with the independent variables included in the model. The fixed effects model is an appropriate specification if we are focusing on a specific set of N firms and our inference is restricted to the behavior of these sets of firms (Baltagi, 2005). Also, in order to find which of these models is the most appropriate, the Hausman test can be conducted.

Empirical Findings and Discussion

Data Preliminaries

The analysis of results starts with the display of data preliminaries which shows tha pattern of the data during the period of study. The data preliminaries are depicted in Fig. 1 to 5 below.
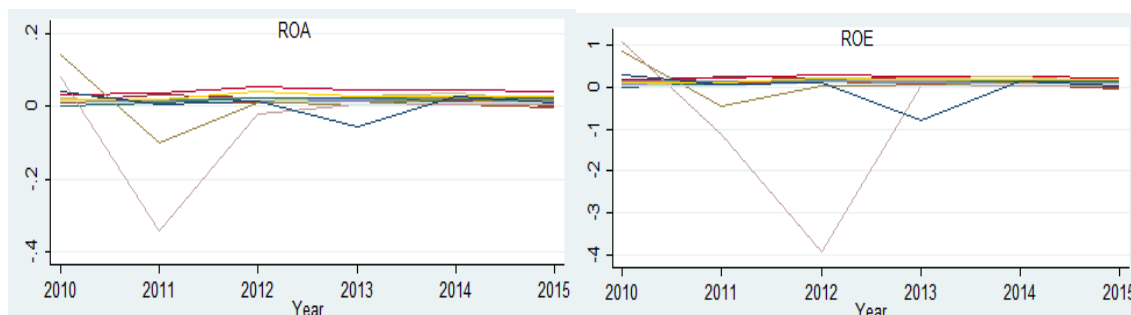

Figure 1 Financial Performance of selected banks in Nigeria for the period of 2010 to 2015 (Return on asset (ROA) and Return on equity (ROE))

As depicted in Figure 1 above, at initial stage, the return on asset (ROA) and return on equity (ROE) of the selected banks is time invariant during the period under study. This implies that there no difference between commercial banks in Nigeria in terms of return on asset and return on equity. Simply put, the study suggest that return on assets and return on equity do not change over time.
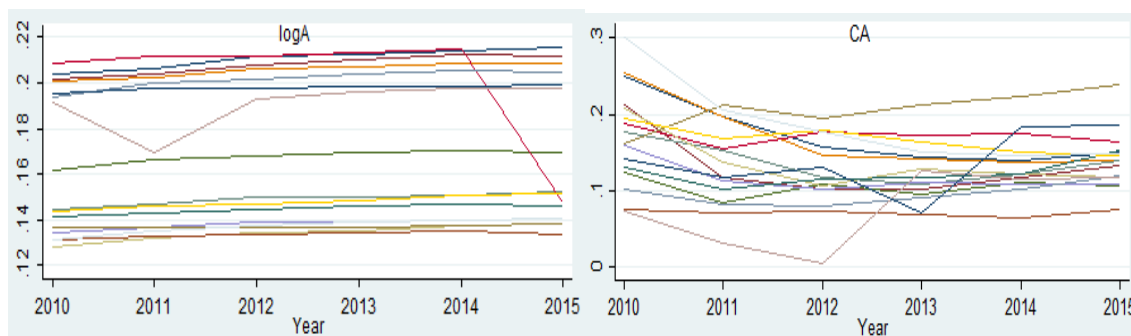

Figure 2 Bank Specific determinants variables of selected banks in Nigeria for the period of 2010 to 2015 (Bank size and Capital adequacy)

As depicted in figure 2 above, at initial stage, the bank size and the capital adequacy of selected banks is time variant during the period of study. This implies that there is a different between commercial banks in Nigeria in terms of size and capital adequacy. In other words, the study can posit that bank size and capital adequacy change over time.
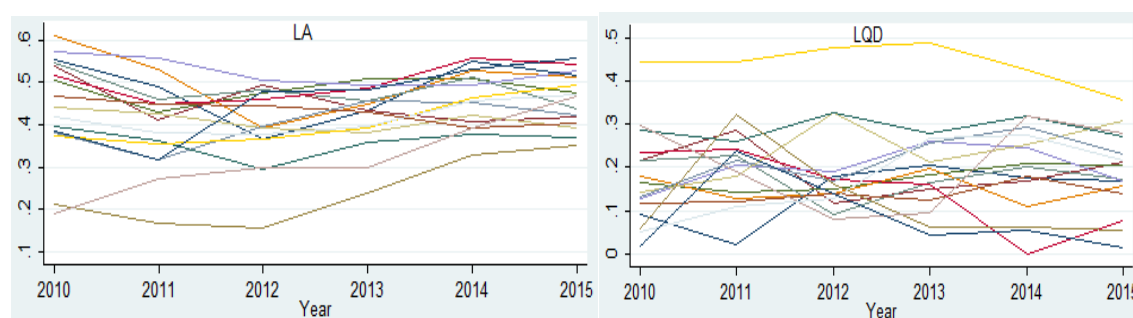

Figure 3 Bank Specific determinants variables of selected banks in Nigeria for the period of 2010 to 2015 (Asset quality (LA) and Liquidity (LQD))

Similarly, as depicted in figure 3 above, at initial stage, the asset quality proxy by loan to asset ratio and the liquidity of selected banks is time variant during the period of study. This implies that there is a different between commercial banks in Nigeria in terms of asset quality and liquidity. In other words, the study can posit that the asset quality of commercial banks and liquidity changes over time.
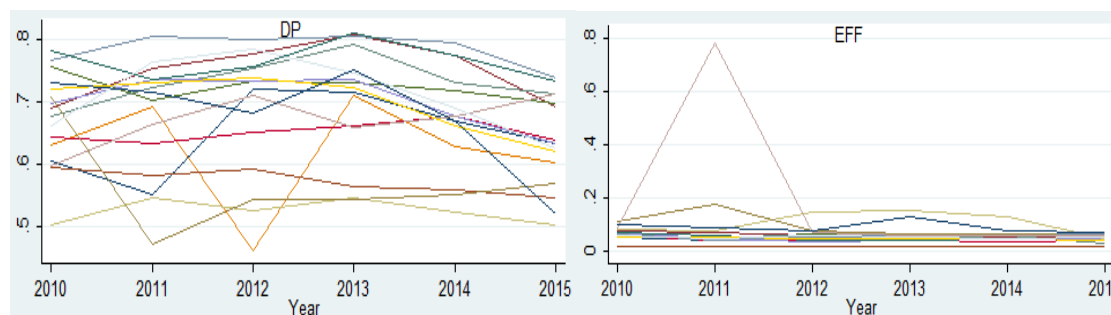

Figure 4 Bank Specific determinants variables of selected banks in Nigeria for the period of 2010 to 2015 (Deposits and Efficiency)

Similarly, as shown in figure 4 above, at initial stage, the deposits ratio of selected banks is time variant during the period of study. This implies that there is a different between commercial banks in Nigeria in terms of deposits. In other words, the study can posit that the deposits of commercial banks changes over time. On the contrary, the efficiency of selected banks is time invariant during the period of study, implying that there is no difference between commercial banks in Nigeria in terms of efficiency.
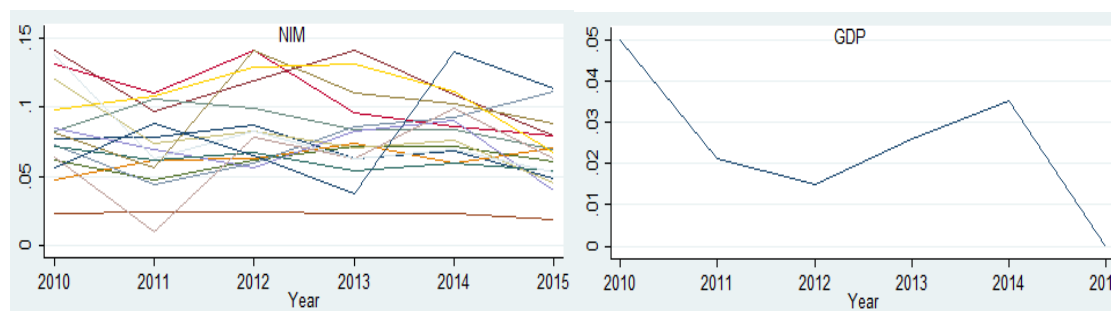

Figure 5 Bank Specific and Macroeconomic determinants variables of selected banks in Nigeria for the period of 2010 to 2015 (Net Interest Margin and Gross Domestic Product)

As depicted in figure 5 above, at initial stage, the net interest margin of selected banks is time variant during the period of study. This implies that there is a different between commercial banks in Nigeria in terms of net interest margin. In other words, the study can posit that the net interest margin of selected commercial banks changes over time. However, the trend of GDP growth in Nigeria have frequently toppled during the period of study.

Descriptive Statistics

The basic descriptive statistics of the variables are presented in Table 1. Preferably, for each variable, Table 1 shows the mean, standard deviation, minimum and the maximum value. On average, the selected banks in the sample have a return on assets ROA of 1.2% and return on equity ROE 6.7% over the period of study. The mean of ROA and ROE varies greatly across the selected banks and periods, with the standard deviation of ROA been 4.3% and ROE been 47% while the minimum and maximum values are - 34% and 14% for ROA, and -394% and 109% for ROE, respectively. Furthermore, the mean of bank size (LogA) is 17%, while the minimum value is 13% and maximum value is 22%. The average of capital adequacy (CA) is 14% with minimum value of 0.5% and maximum value of 30%. The mean of loans to assets ratio is approximately 43% with minimum and maximum value of 15% and 61% respectively. Liquidity ratio is one of the most important ratio that determines the profitability of banks, it is 19% on average, while the minimum and maximum value varies between 0.008% and 49%. The deposits to assets ratio amount to 67% on average, implying an averagely high rate of deposit in the selected banks. The

efficiency amount to 7% on average and net interest margin (NIM) amounts to 8% on average, for the selected commercial banks in the study. On the other hand, Table 1 reports the mean of macroeconomic variable over the period of 2010 to 2015. The average growth rate of GDP is approximately 2.4%, minimum value of -0.009% in 2010 and maximum value of 4.9% in year 2015.

Table 1 Descriptive Statistics of Variables

	N	Minimum	Maximum	Mean	Std. Dev.
ROA	96	-0.3439	0.1396	0.0125	0.0432
ROE	96	-3.9431	1.0944	0.0675	0.4697
logA	96	0.1282	0.2160	0.1691	0.0314
CA	96	0.0052	0.3015	0.1379	0.0493
LA	96	0.1545	0.6103	0.4296	0.0901
LQD	96	0.00007	0.4897	0.1934	0.1014
DP	96	0.4627	0.8105	0.6752	0.0862
EFF	96	0.0151	0.7803	0.0665	0.0782
NIM	96	0.0095	0.1414	0.0776	0.0300
GDP	96	-0.00009	0.0498	0.0245	0.0157

Sources: Author's Estimation

The study further examine the correlation between the ten variables by employing the Variance Inflation Factor. The result indicates that there is no autocorrelation problem in the analysis; in other words, there is no multicollinearity problem. The Variance Inflation Facto (VIF) is depicted in Table 2 below.

Table 2. Variance Inflation Factor

Variable	VIF	1/VIF
CA	1.70	0.587660
NIM	1.65	0.607669
DP	1.29	0.774857
LogA	1.25	0.799786
LA	1.21	0.825044
LQD	1.18	0.843945
EFF	1.15	0.867477
GDP	1.09	0.919788
Mean VIF	1.32	

Sources: Author's Estimation

Empirical Results from Panel Data Analysis

The study applies panel data analysis for its estimation, which requires special techniques to account for time-series and cross-sectional dimension of the data. Therefore, the study use different techniques for estimation and choose among them based on the specific econometric test to find a model which fits our data best. As a results, Hausman specification was conducted to determine the effects (fixed or random) to be used in the two empirical models.

Table 3 Summary of panel data analysis

Variables	Model 1	Model 2
	ROA	ROE
logA	-0.0634 (0.3537)	0.0475 (1.6228)
CA	-0.0939 (0.0977)	2.7311** (1.2079)
LA	-0.0448 (0.0468)	0.2943 (0.5581)
LQD	-0.0366 (0.0378)	0.8567* (0.4904)
DP	0.0665 (0.0534)	0.0317 (0.6020)
EFF	-0.4981*** (0.0372)	-1.3989**(0.6268)
NIM	0.1091 (0.1296)	-1.6328 (1.9494)
GDP	0.4211** (0.1614)	3.1408 (3.0326)
Cons	0.0319 (0.0762)	-0.4879 (0.5111)
R-square	0.7706	0.4905
Prob > F	0.0000***	0.0168**
No. of Obs	96	96
Hausman test	0.0099 ** (20.12)	0.3526 (8.88)
	Reject H_0	Accept H_0

Notes: Figures in the bracket are standard errors.

***, **, * indicates significant at 1%, 5% and 10% respectively.

Sources: *Author's Estimation*

The results from the specifications test in Table 3 above indicates that fixed effect should be employed for Model 1 of the study proxy by return on assets (ROA) as dependent variable and random effect to be employed for Model 2 of the study proxy by return on equity (ROE) as dependent variable.

Interpretation of the Empirical Model 1

Specifically, the major determining factor of profitability (ROA) during the period of study is efficiency and GDP growth rate. Therefore, based on the coefficient values shown in Table 2 above, the model 1 with return on asset (ROA) as dependent variable produced the following empirical results:

$$ROA_{it} = 0.0319 - 0.063(logA_{it}) - 0.093(CA_{it}) - 0.044(LA_{it}) - 0.036(LQD_{it}) + 0.066(DP_{it}) - 0.498(EFF_{it}) + 0.109(NIM_{it}) + 0.421(GDP_{it}) \qquad ...(2)$$

Vis-à-vis the fixed effect model, the study found that efficiency has a correct negative and significant effect on ROA at 1% level. This implies that an increase in the efficiency of commercial banks leads to decrease in profitability by 4.9%, *ceteris paribus*. Furthermore, GDP growth has a correct positive and significant effect on ROA at 5% level. The implication is that positive economic growth influence the return on asset of banks positively. Therefore, an increase in GDP growth rate by 1% increases profitability ROA by around 4.2%, *ceteris paribus*. However, other bank-specific variables namely, bank size, capital adequacy, loan to asset ratio, liquidity, deposit and net interest margin are found to have no significant effect on banks return on assets.

Interpretation of the Empirical Model 2

Precisely, the major determining factor of profitability (ROE) during the period of study is capital adequacy, liquidity and the efficiency ratio. Therefore, based on the coefficient values shown in Table 2 above, the model 2 with return on equity (ROE) as dependent variable produced the following empirical results:

$$ROE_{it} = -0.487 + 0.047(logA_{it}) + 2.731(CA_{it}) + 0.294(LA_{it}) + 0.856(LQD_{it}) + 0.031(DP_{it}) - 1.398(EFF_{it}) - 1.632(NIM_{it}) + 3.140(GDP_{it}) \qquad ...(3)$$

We can make the first inference from the empirical model that capital adequacy has a correct positive and significant effect on profitability ROE at 5% level. The implication is that as capital adequacy increases, ROE also increase by around 27%, *ceteris paribus*. Similarly, liquidity has a correct positive but weak significant effect on ROE at 10% level. This implies that as liquidity increases by 1%, profitability ROE increase by around 8.5%, *ceteris paribus*. However, efficiency has a correct negative and significant effect on profitability ROE at 5% level. This suggests that as efficiency increases by 1%, profitability ROE also

decreases by around 14%, *ceteris paribus*. However, other bank-specific variables namely; bank size, loan to asset ratio, deposits volume and net interest margin show no significant impact on profitability. The macroeconomic variable does not have a significant impact on banks return on equity.

Discussion of Findings

Indeed, facts show that banks are also exposed to a wide array of risks, bank-specific and macroeconomic factors whereby there are stand outs and normally related to each other. The empirical analysis of this study indicates that efficiency has a correct and negative significant effect on profitability ROA. The implication is that any undesirable increase in efficiency leads to decreases in return on assets of banks. It is important to note that the lower the efficiency ratio, the better (50% is generally regarded as the maximum optima ratio). Therefore, an increase in the efficiency ratio indicates either increasing costs or decreasing revenue. No study as look into the efficiency and return on assets in Nigeria. Furthermore, GDP growth rate has a correct positive and significant effect on return on assets. It is with prior expectation that GDP will have a positive effect on profitability because positive growth rate influences profitability, hence opening new avenue for demands of financial services in the sector. This is inconsistent with previous studies (Tafri, Hamid, Meera & Omar, 2009) who found a negative and significant relationship between GDP and return on assets in Malaysia. Other bank-specific variable have no effect on profitability ROA of selected banks. In the second model, capital adequacy has a correct positive and significant effect on return on equity. The implication is that increase in capital of selected banks leads to increase in return on equity, suggesting that banks makes use of shareholder's fund to generate more returns and improves performance. This is consistent with study of (Kenny, Jumoke & Faderera, 2014), but inconsistent with the findings of (Alper & Anbar, 2011) which found a positive but insignificant effect. Liquidity also has a positive but weak significant effect on return on equity. This suggest that the more liquidity banks hold, the more increase in returns as a results of meeting daily and financial demands of customers through lending. This inconsistent with the findings of (Alper & Anbar, 2011) which a positive but insignificant effect. However, efficiency ratio has a correct negative and significant effect on return on equity during the period of study. No study have look into the relationship between efficiency and return on equity in Nigeria. Other bank-specific and macroeconomic variable does not affect the return on equity of commercial banks during the period.

Conclusions

The preceding empirical analysis shed some light on the determinants of banks profitability measures in commercial banks. Therefore, based on the empirical evidence, this study confirms the major bank-specific and macroeconomic determining factors of profitability during the period of study. Profitability is an important criterion to measure the performance of banks, especially in the changing and ever dynamic environment in which banks operate. As a result of this, panel data method (fixed and random effect model) is applied to the data obtained from 16 banks financial reports for the period of 2010 to 2015. As a summary, the study found that the major factor that determines banks profitability return on assets ROA and return on equity ROE during the period are capital adequacy, liquidity, efficiency and the GDP growth rate. However, it would also be of interest if further study can use quarterly data to capture the effects that lag behind in the analysis. It is therefore suggested that future research cover a wider cross-section, a longer and different time period and include a wider range of variables. Albeit, there are still a lot of avenues and opportunities to explore further in this area. As a matter of fact, further study should not be limited to the banking industry but should also extend to other sectors or industries as well.

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