BANK SPECIFIC, INDUSTRY SPECIFIC AND MACROECONOMIC DETERMINANTS OF BANK PROFITABILITY IN NIGERIA

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Abstract

This study investigates the impact of bank-specific, industry-specific and macroeconomic indicators on bank profitability in Nigeria over the time period from 1998 to 2012, using random-effect model. Bank profitability is proxied by return on assets (ROA) return on equity (ROE) and net interest margin (NIM). Findings suggest the existence of positive and significant effect of capital adequacy, bank size, productivity growth and deposits on profitability. Credit risk and liquidity ratio have a negative and significant effect on bank profits. However, no evidence is found in support of the effect of industry-specific variables. Finally, as expected, inflation rate and interest rate are negatively and significantly related to bank profitability.

Keywords: Bank profitability, Nigeria, random-effects model

Introduction

The two major functions of a commercial bank are the mobilisation of deposits and the extension of credits Adekanye, 1986). As financial intermediary, bank collect deposits and paying interest on them, making loans and advances and charging the borrowers higher rates of interest. In rending this service to borrowers and depositors, banks have an expectation of achieving targeted rates of returns. Apart from granting loans, banks also generate profit from investments. In a bid to maximise their earnings, every bank attempts to structure its assets and liabilities in a way as to yield the highest returns, bearing in mind the risk involves and subject to some constraints.

The assets held by banks may be categorised into two broad classes; the earning assets and the non-earning assets. The earning assets are loans and investment, while the non-earning assets consist of fixed assets, total reserves of banks, vault cash and non-interest earning deposit with the Central Bank. Profits are often generated by the earning assets.

Most of the banks' liabilities are payable on demand, but it is known by banks that on the average, customers will usually demand for a small proportion of the funds deposited at any given time. Hence, provided adequate provision is made to cover such withdrawals, the balance of the deposits can be given as loan to credit-worthy customers of the bank. The bulk of the profits made by banks arise from the difference between the costs of funds deposited by customers and the charges on Loans to borrowers. Generally, depositors receive lower rates of interest in comparison to the rate charged on loans. Based on the foregoing, we can say that the more money banks are able to lend the higher their profit.

As financial intermediaries, banks play a pivotal role in the economic activities of most nations. The efficiency of banks financial intermediation roles play a significant role in economic growth. Profitable banks are in better position to contribute positively to the Gross Domestic Product of a nation.   Besides, Banks liquidation usually provoke systemic economic crisis.   Therefore, it is important to study the determinants of Bank's profitability.

The Nigerian banking industry occupied an important position in the country financial system, serving as mechanism to finance economic growth. The banking sector in Nigeria has undergone various reforms, one of which led to the establishment of Asset Management Corporation of Nigeria (AMCON). Before its establishment, some banks were getting excellent ratings, while sitting on non-performing loans running into over 40 per cent. The purchase of the non-performing Assets of the banks by AMCON has returned most of the banks to the path of real profit making.

Linkages between bank profitability and failure and its external and internal determinants depend upon which factors in the micro and macro economy are most strongly linked to the banking industry.   As macroeconomic, social and legal environment changes, determinants of banking sector profitability might also change. Hence, this paper attempts to study the determinants of bank profitability in Nigeria from 1998 to 2012.

The remainder of the paper is organized as follows: section 2 discusses the existing literature on the determinants of bank profitability. Section 3 describes the model specification, estimation techniques. The results of the empirical analysis are presented in section 4, while section 5 concludes the paper.

Review of Related Studies

Generally, literatures consider bank profitability as a function of both internal and external determinants. The internal determinants are micro or bank specific variables that are products of bank business activities and are affected by bank level management. Such as capital adequacy, liquidity ratio, asset quality, cost efficiency, size and risk management. The external determinants on the other hand, are not linked directly to bank management activities but are products of social, economic and legal environment that affects the operation and performance of banking industry. Those that can be linked to the banking sector are termed industry specific variables, examples of which are Ownership and Concentration (Athanasoglou, Brissmis and Delis, 2005). While those not peculiar to the industry are macroeconomic factors. This include; Inflation, Economic Growth and Market Interest Rates.

An extensive body of literature have examined the determinants of banks' profitability in many countries around the world. The first group of studies were provided by Haslem (1968), Short (1979), Berger, Hanweck and Humphrey (1987) and Bourke (1989).

Empirical Studies on the determinants of bank profitability could be divided into those that focus on a single and specific country and those carried out using panel of countries. Among those that concentrated on a single country are; Berger Hanweck and Humphrey (1987), Berger (1995), Angbazo (1997), Neely and Wheelock (1997), Afanasieff, Lhacer and Nakane (2002), Mamatzakis and Remoundos (2003), Ben (2003), Athanasoglou, Brissimis and Delis (2005), Ben and Goaied (2008), Heffernan and Fu (2008), Dietrich and Wanzenried (2011), Lui and Wilson, (2010), Deger and Adem (2011), Ameur and Mhiri (2013). The list of those that concentrated their studies on specific or individual country's banking system include; Haslem (1968), Bourke (1989), Molyneux and Thornton (1992), Demirguc-Kunt and Huizinga (1999), Abreu and Mendes (2002), Hassan and Bashir (2003), Stakouras and Wood (2004), Athanasoglou, Delis and Stakouras (2006), Pasiouras and Kosmidou (2007).

Berger, Hanweck and Hunphrey (1987) investigated the relationship between size and profitability using USA Banking industry. They suggest that only small cost saving can be achieved by increasing the size of a banking firm. This means that size expansion will not significantly reduce the cost of banking operations.

In USA, Berger (1995), examined the profit structure relationship in banking firm. The study centred on the effect of managerial and scale efficiency on concentration and profit. The finding suggest that increased managerial and scale efficiency will increase market share and hence increase concentration and profit.

Also, Angbazo (1997) investigated the determinants of bank profitability using a sample of banks in USA with data from 1989-2003 time period. He concluded that opportunity cost of non-interest bearing reserves, leverage, management efficiency and default risk are positively related to bank interest margin.

In Malaysia, Guru, Staunton and Balashanmugam (2002), studied the determinants of bank performance using a sample of seventeen commercial banks from 1986-1995 time period. They concluded that efficient expenses management is one of the most significant explanatory variables of high bank profitability. Also, inflation is found to relate positively with bank performance, while interest ratio have a negative relationship with bank performance. They also suggest that banks usually transfer their overheads to depositors in terms of lower deposit rates and to borrowers in terms of high lending rates.

The research carried out in Brazil by Afanasieff, Lhacer and Nakane (2002), investigated the determinants of banks interest spreads using micro and macro economic variables. They established that macro economic variables have more impact on bank interest spread than micro economic indicators.

Mamatzakis and Remoundos (2003), examined the determinants of bank profitability in Greece. The findings of their study shows that bank strategic planning variables, like; loans to assets ratio, equity to asset ratio and personnel expenses, are the major determinants of bank profitability. They also emphasised that economic of scale play a significant role in bank profitability.

A study conducted by Ben (2003) in Tunisian, investigated the impact of financial structure, banks characteristics and macro economic variables on banks profitability, using data from 1983 to 2000 period. He found that banks with large capital and overheads are associated with high profitability. The findings of his study also reveal an inverse relationship between concentration, inflation, economic growth and bank profitability.

A further study by Ben and Goaied (2010) in Tunisia, indicated a negative relationship between bank size and profitability. Contrary to the findings of Ben and Goaied (2010), Smirlock (1985), Sinkey and Greenawalt (1991), Demerguc-Kunt and Huizinga (1999), Dietrich and Wanzenried (2011) in their studies, concluded that because of economies of scale, larger banks are more profitable than the smaller ones. Based on their findings, better capitalized banks seem to have higher market power and hence more profit. This results confirm markets-power hypothesis which suggests that firm with large market shares tend to be more profitable.

Athanasoglou, Brissimis and Delis (2005) examined the effect of bank-specific, industry-specific and macroeconomic determinants of bank

profitability in Greece, using an empirical framework that incorporated the traditional market-power hypothesis. The findings of their study shows that business cycle significantly affects bank profits.   Also, inflation is established to positively and significantly affect profitability. Starting from Revell (1979), who concluded that the relationship between inflation and bank profitability depends on whether banks' operating expenses increase than the rate of increase in inflation, the relationship (between inflation and profits) has been a controversy. In line with the finding of Athanasoglou, Brissimis and Delis (2005), Molyneux and Thornton (1992), Guru, Staunton and Balashanmugam (2002) established positive relationship between inflation and bank profitability. Contrariwise, Ameur and Mhiri (2013) established a significant negative relationship between inflation and net interest margin. Also, the studies conducted by Abreu and Mendes (2000) in Europe and Ayadi and BoujeIbene (2012) in Tunisian found a negative relationship between inflation and bank profitability. Ben (2003), Zeitun, Tian and Keen (2007), revealed an insignificant negative relationship between inflation and firm profitability. Also Aper and Anbar (2011) concluded that inflation and GDP growth rate have no important effect on bank profitability. Athanasoglou, Delis and Stakouras (2006) examined the effect of selected set of determinants of banks profitability in Europe from 1998-2002 time period. They concluded that inflation has a significant impact on profitability and concentration is positively correlated with bank profitability, while a non-significant relationship exist between real GDP per capital and banks profitability.

Haslem (1968), short (1979) Bourke (1989), Molyneux and Thornton (1992) , in their cross-country studies on the determinants of banks profitability, emphasized the significant impact of size to profitability. They suggest a positive link between bank size and capital base. They concluded that an increase in the size of small and medium banks increases profitability. Using 18 European countries banks, Molyneux and Thorton (1992) established a significant positive relationship between interest rates, concentration, government ownership, better quality/management and return on equity. Also, a significant negative relationship is found between level of liquidity and profitability.

In their study using 80 developed and developing countries banks, from 1988-1995 time period, Demirguc-Kunt and Huizinga (1999) examined the determinants of bank profitability using a set of macroeconomic indicators and bank specific variables. Their findings reveal a positive relationship between capital ratio and bank performance.

Abreu and Mendes (2002), investigated the determinants of bank profitability in some European countries. The results indicated that well-

capitalized banks have less corporate insolvency costs and in better position to earn more profits.

Hassam and Bashir (2003) examined the relationship between bank loan and profitability, using Islamic banks from 21 selected countries. It is found that higher loan ratio have negative impacts on profitability.

In their study on the impact of macroeconomic indicators on bank performance, Staikouras and Wood (2003) found growth of GDP and the variability of interest rate to have negative effect, while the level of interest rate have positive impact on bank performance. On the contrary, Pasiouras and Kosmidou (2007) found a positive association between economic growth and financial sector profitability.

On the whole, the existing literature reveal a comprehensive account of the determinants of bank profitability, but literature describing the profitability determinants of the Nigerian banking sector is sparse. With reference to the banking system examined, Nigerian banks operate in a different economic, social and legal environments. Since both data sets and environments differ, the empirical results might vary significantly. Also, Nigerian banks are currently undergoing series of reforms. One of which is consolidation occasioned by an increase in the capital base, which resulted in availability of more funds which could be channelled to lending for profitable ventures. It also brought challenges ranging from the sustenance of the growth in the system, compliance with international standard of operations which has further exposed the Nigerian banks to a globalised business environment.   Hence the need to examine the bank-specific, industry-specific and macroeconomic factors affecting bank profitability in Nigeria.

Data, Variables, Estimation Technique and Model Specification
Data

To investigate the determinants of bank profitability in Nigeria, we collected data on 10 Deposit Money Banks (DMBs) over the period of 15 years from 1998-2012, involving 150 observations. Bank specific data used for the empirical analysis are collected from annual reports of each of the banks selected, while the industry and macroeconomic data are sourced from the Publications of the Central Bank of Nigeria. On the whole, since all the banks selected are observed for the entire period equally, the data are arranged into a balanced panel for the empirical analysis.

Variables

The available literature provides a comprehensive account of variables affecting bank profitability. In order to analyze the determinants of bank profitability in Nigeria, we include sixteen relevant variables, divided

into three categories. Three of which are dependent variables, often used as measure of bank profitability. The rest are the explanatory variables which include, eight bank specific, two industry and three macroeconomic variables.   The variables, definitions, notation and expectation are summarised in Table 1 below.

Table 1: Variables, Proxies, Notation and Expected Sign

	Variable	Proxy/Measurement	Notation	Expected Sign
Dependent Variable	Profitability	Return on Assets: Ratio of Net Profit to Total Assets	ROA	
		Return on Equity: Ratio of Net Profit to Total Equity	ROE	
		Net Interest Margin: Ratio of Net Profit to Total Assets	NIM	
Bank – Specific Variables	Capital Adequate	Ratio of Regulatory Capital to Risk-Weighted Assets	RCRA	+
	Asset Quality	Credit Risk: Ratio of Non-Performing Loans to Total Gross Loan	NPLTL	-
	Size	Natural logarithm of Total Assets	Log A	+
	Liquidity	Ratio of Liquid Assets to Short-term Liabilities	LASL	-
		Ratio of Liquid Assets to Total Assets	LATA	-
	Productivity	Ratio of Total Income to number of employees	TIE	+
	Operating Expenses Management	Ratio of Operating Expenses to Total Assets	OETA	-
	Deposits	Ratio of Total Deposit to Total Assets	TDA	+
Industry Specific Variable	Concentration	Ratio of Assets held by Four Largest Banks to Total Assets of ten Banks	ATA	-
	Industry Growth	Ratio of the Bank Total Assets to GDP	AGDP	-
Macroeconomic Variable	Economic Growth	Real Growth Rate of GDP	RGDP	+
	Inflation Rate	Annual Inflation Rate	INFR	-
	Interest Rate	Real Interest Rate	INTR	-

Estimation Technique

To investigate the determinants of bank profitability in Nigeria, we adopt a panel data regression model. The technique is chosen because it take heterogeneity explicitly into account by allowing for individual-specific variables. It gives more variability, less collinearity among variables, more degrees of freedom and more efficiency (Baltagi, 2005).

The two most prominent techniques of estimating panel data are the fixed effects model (FEM) and the random effects model(REM) or error

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components model (ECM). In FEM, the intercept in the regression model is allowed to differ among individuals to account for the fact that each individual, or cross-sectional unit may have some special characteristics of its own.

In REM, it is assumed that the intercept of an individual is a random unit, drawing from a much larger population with a constant mean value. The individual intercept is then equated to the constant mean value. REM is economical in degrees of freedom and is appropriate in situations where the (random) intercept of each cross-sectional unit is uncorrelated with the regressors (Gujarati, 2006).

The next issue is the choice between FEM and REM. To choose, we used Hausman (1978) test, with a null hypothesis that FEM and REM estimators do not differ significantly. With the asymptotic X^2 distribution, the results reveal that the null hypothesis could not be rejected. Hence, our conclusion is that FEM is not appropriate and that we are better off using REM. In our data, since each cross-sectional unit has the same number of time series observations, then we have a balanced panel.

Model specification

For the purpose of our empirical analysis, the following model is specified:

$$\pi_{it} = \beta_{1i} + \beta_2(BSV)_{it} + \beta_3(ISV)_{it} + \beta_4(MEV)_{it} + U_{it} \qquad ...…..(1)$$

Where, β_{1i} is a random variable with a mean value of β_1. The intercept value for an individual bank can be expressed as:

$$\beta_{1i} = \beta_1 + \varepsilon_i \quad i = 1, 2, 3, \qquad ….N \qquad ....(2)$$

Where, ε_i is a random error term with a mean value of zero and variance of δ_ε^2,

What we are essentially implying is that the ten (10) banks included in our sample are drawn from a larger population of twenty one (21) Deposit money banks in Nigeria, and that they have a common mean value for the intercept (β_1) and the individual differences in the intercept values of each bank are reflected in the error term ε_i. Substituting equation (2) into equation (1), we obtain:

$$\pi_{it} = \beta_1 + \beta_2(BSV)_{it} + \beta_3(ISV)_{it} + \beta_4(MEV)_{it} + \varepsilon_i + U_{it} ....(3)$$

$$\pi_{it} = \beta_1 + \beta_2(BSV)_{it} + \beta_3(ISV)_{it} + \beta_4(MEV)_{it} + Z_{it} \qquad ....(4)$$

Where;

π_{it} is the probability of banking i at time t, with i = 1, 2, -----N; t = 1, 2 ----T, β_1 is a constant term, β_2 ……........ β_3 are the coefficients of the explanatory variables, BSV, represent the bank-specific variables, ISV, the industry-specific variables and MEV, the macroeconomic variables, Z_{it} is the composite error term.

$$Z_{it} = \varepsilon_i + U_{it} \qquad\qquad\qquad ......(5)$$

The composite error term Z_{it} consists of two components; ε_i which is the cross-section, or individual-specific error component, and U_{it}, which represent the combined time series and cross-section error component.

Our model is based on the following assumptions;

$\varepsilon_i \ \sim\ N(O,\delta\varepsilon^2)$

$U_{it} \sim\ N(O,\delta\varepsilon^2)$

$E(\varepsilon_i\,U_{it}) = O\ E(\varepsilon_i\,\varepsilon_j) = O\ (i \neq j)$

$E(U_{it}\,U_{ir}) = E(U_{it}\,U_{jt}) = E(U_{it}\,U_{jr}) = O\ (i \neq j;\ t \neq r)$

Results and Analysis
Results of Descriptive Statistics

Table 2 presents the descriptive statistics for all the variables in our model. The Table (Table 2) shows the characteristics of the variables used by revealing the statistical mean, standard deviation, minimum and maximum values.

Table 2: Descriptive Statistics for the variables

Variable	Mean	Standard Dev.	Minimum	Maximum
ROA	0.6103	0.3520	-8.4112	3.8134
ROE	0.2443	0.3422	-3.5811	0.8215
NIM	2.6431	1.1524	0.5322	5.4112
RCRA	0.4214	0.2431	-1.4821	3.2113
NPLTL	0.4156	0.3312	-4.0122	3.0214
Log A	21.5812	6.3324	16.1143	20.1341
LASL	0.4212	0.1432	0.2814	0.6131
LATA	0.2892	0.1314	0.0261	0.4321
TIE	0.8152	0.5241	0.3413	0.6213
OETA	0.3461	0.1723	0.0352	0.7321
TDA	0.6974	1.1629	0.2682	6.3482
ATA	0.7622	2.4323	0.4432	2.8431
AGDP	0.9034	1.2531	-2.3413	3.0142
RGDP	3.0438	2.4131	-1.8512	4.3211
INFR	0.4012	0.7321	0.2633	0.8821
INTR	0.2182	0.2634	0.0414	0.2432

From Table 2, the descriptive statistics of the variables reveal the following; The Nigerian banks have ROA of 61%, ROE of 24% and NIM of 26% over the period from 1998 to 2012. The standard deviation of 35%, 34% and 115% for ROA, ROE and NIM respectively, show that there are large variations in the profitability of the Nigerian banks with minimum values of -841%, -358%, 53% and maximum values of 381%, 82% and 541% for ROA, ROE and NIM respectively. On the bank-specific variables, the average liquidity of the banks represented by LASL and LATA are 42% and 28% respectively. The standard deviation of LASL (14%) and LASL

(13%), with minimum and maximum values of LASL (28%, 61%) and LATA (2.6%, 43%), show the existence of wide variation in the Nigerian bank liquidity position. The liquidity ratio of some of the banks fell below the 30% stipulated by the Central Bank of Nigeria, which caused the distress witnessed in the industry. When the mean of capital adequacy ratio (RCRA) is 42%, the minimum and maximum values are -148% and 321% respectively. On the average, the ratio of Non-performing loans to total loans which describes the level of credit risk in the industry is 42%. With a standard deviation of 33%, minimum and maximum values of -401% and 302% respectively, there are large differences in the assets quality of the Banks. This shows that some of the banks were sitting on an extremely high non-performing loans before the establishment of the Assets Management Company of Nigeria. The mean values of TIE (82%), OETA (35%), TDA (70%), ATA (76%) and AGDP (90%), reveal that they all have positive averages, with their standard deviations showing high volatility over the study period. On the average, the ratio of total deposit to total assets of the banks is 70% while the four largest banks hold 76% of entire assets of the ten banks. Also, the descriptive statistics of the macroeconomic variables reported in Table 2, show that RGDP (304%), INFR (40%) and INTR (22%) have positive averages during the period covered by the study.

Correlation Matrix between explanatory variables

Table 3 reveals the correlation coefficient between the independent variables in the models to test the null hypothesis of zero multicollinearity.

Table 3: Correction Matrix

	RCRA	NPLTL	Log A	LASL	LATA	TIE	OETA	TDA	ATA	AGDP	RGDP	INFR	INTR
RCRA	1.0000												
NPLTL	0.2148	1.0000											
Log A	0.3125	-0.0432	1.0000										
LASL	0.1432	-0.0531	0.3215	1.0000									
LATA	0.2123	-0.1236	0.3316	0.4356	1.0000								
TIE	0.2534	-0.0349	0.2148	0.1214	0.3132	1.0000							
OETA	-0.0431	0.3314	-0.1214	-0.0114	-0.2238	0.0152	1.0000						
TDA	0.3014	-0.4138	0.0141	0.1251	0.3414	-0.0155	-0.2731	1.0000					
ATA	0.3314	-0.0124	0.3242	0.2142	0.0538	0.2143	-0.1615	0.2871	1.0000				
AGDP	0.4126	-0.1567	0.2676	0.3166	0.3125	0.4132	-0.0613	0.3415	0.0615	1.0000			
RGDP	0.3144	-0.1768	0.3214	0.2582	0.2817	0.1581	-0.1613	0.3114	0.0134	0.1036	1.0000		
INFR	-0.1432	-0.6643	-0.1814	0.0214	0.0317	0.1254	0.1617	-0.0188	0.0164	0.0613	0.0431	1.0000	
INTR	-0.2167	0.1868	0.0352	0.0442	0.0613	0.1812	-0.0146	0.1481	0.2618	0.1869	0.2434	0.51461	1.0000

From Table 3, it is evident that the correlation coefficients between the explanatory variables are very low. The correlation coefficient are generally less than an average value of 50% except between, inflation rate and Non-performing loan (66%), real interest rate and inflation rate (51%), which are very moderate. Hence, the null hypothesis of no multicollinearity could not be rejected.

Result of the Panel Data Model

Table 4: Results of the Random-effects Model for Determinants of Bank Profitability

Explanatory Variables	ROA	ROE	NIM
Constant	-0.0185 *** (0.00)	-0.1841 ** (-0.00)	-0.2014 ** (-0.02)
Bank-Specific Variables			
RCRA	-0.0482 (0.3215)	0.2123 *** (0.00)	0.6142 *** (0.00)
NPLTL	-0.4018 ** (0.01)	-0.2514 *** (0.00)	-0.3411 *** (0.00)
LOGA	0.3252 *** (0.00)	0.0824 ** (0.01)	0.1843 * (0.05)
LASL	-0.2815** (0.01)	-0.6168 *** (0.00)	0.4812 (0.42)
LATA	-0.04261 (0.62)	-0.1565 *** (0.00)	-0.6143 *** (0.00)
TIE	0.4211 *** (0.00)	0.8442 ** (0.03)	0.7522 (0.29)
OETA	-0.1143 * (0.06)	-0.4322 (0.30)	-0.0124 (0.43)
TDA	0.3821 *** (0.00)	-0.6241 (0.32)	0.2215 ** (0.02)
Industry-Specific Variables			
ATA	-0.2314 ** (0.03)	-0.4321 (0.32)	0.1438 (0.22)
AGDP	0.0481 *** (0.00)	0.3271 (0.25)	0.1645 (0.41)
Macroeconomic Variables			
RGDP	0.2242 (0.31)	0.0142 (0.22)	0.3353 (0.51)
INFR	-0.1832 ** (0.03)	-0.4564 * (0.08)	0.2477 (0.32)
INTR	-0.1624 * (0.08)	0.4231 (0.42)	-0.0814 *** (0.00)
No. of observation	140	140	140
R-Squre	0.67	0.62	0.72
F-Statistic	(0.00)	(0.00)	(0.00)

Note: *, ** and *** *indicate level of significance at10%, 5% and 1% respectively.*
Probability values in brackets..

Table 4 reports the empirical result of the estimation of model (4) using ROA, ROE and NIM as profitability variables. On bank specific-variables; capital adequacy is highly significant and positively related to profitability at 1% significant level. The negative relationship recorded between RCRA and ROA is not significant. This finding corroborate those of Bourke (1989), Demirguc – Kurt and Huizinga (1999), Athanasoglou, Brissimis and Delis (2005), Ben and Goaied (2010) and Ameur and Mhiri (2013) who suggest that well – capitalised banks have higher margins and profitability. The result is consistence with our expectation and it implies that highly capitalised banks are able to pursue business opportunities more

effectively and have more time and flexibility to address problems arising from unexpected losses, thus realising enhanced profitability.

Credit risk (NPLTL) is negatively related to profitability for all regressions.   The negative relationship is highly significant for all the estimated equations.   The result is consistence with the finding of Athanasoglou, Brissimis and Delis (2005), Alper and Anber (2011) that credit risk is negatively and significantly related to bank profitability. This might be responsible for the risk-averse management behaviour of the Nigerian Bank. Bank size, represented by the logarithim of total assets, is positive and significant in relation to profitability. This result confirms our expectation and corroborate those of Smirlock (1985), Zeitun, Tian and Keen (2007) and Alper and Anbar (2011) that bigger banks usually benefit from higher product and loan diversification opportunities and economies of scale, resulting in increased profitability. Bank liquidity, proxied with the ratio of liquid assets to short-term liabilities (LASL) and the ratio of liquid assets to total assets, has a negative and significant effect on profitability. Although, using net interest margin (NIM) and LASL as proxies of bank profitability and liquidity respectively, we found a positive and non-significant relationship. This finding is in line with our expectation and it corroborate finance theory of a negative relationship, which brought about profitability-liquidity trade-off. If a bank does not invest sufficient funds in current assets, it may become illiquid and therefore, risky. Also, with huge investment in current assets, the bank would lose profitability, as idle current assets would not earn anything. Also, our result confirms a negative correlation between liquidity and profitability by Molyneue and Thorton (1992).

Our productivity growth indicator (TIE) is positively related to profitability for all regression estimations. It is highly significant when profitability is measured by ROA and ROE. This suggests that labour productivity growth will enhance bank profitability.

Operating expenses management has a negative effect on profitability in all the ROA, ROE and NIM regressions, but only significant at 10% level when ROA is used as proxy for profitability. This negative relationship suggests that an increase in operating expenses in relation to Total Assets would reduce bank profits. Hence, an efficient expenses management is required for improved profitability.

As for deposits volume, measured by TDA, we find a positive and significant effect on profitability in ROA and NIM regressions. The negative effect on profitability in ROE regression is not significant. This finding suggests that Nigerian banks increase their profits by converting the increasing amount of deposit liabilities into save credit facilities and other profitable investment opportunities.

Next, are the industry-specific variables represented by concentration (ATA) and banking growth (AGDP). Concentration (ATA) shows a negative relationship with profitability in ROA and ROE regressions. The negative relationship is significant at 5% level when ROA is proxied for profitability.   This negative relationship between concentration and profitability is in line with our expectation and it corroborate the findings of Berger (1995), Athanasoglou, Brissimis and Delis (2005) and Ameur and Mhiri (2013) that concentration affects bank profitability negatively. On the impact of banking industry growth, our empirical results show that it affects bank profitability positively. Although, net interest margin as proxy for profitability, is negatively and significantly affected by banking growth, the overall positive effect is relatively insignificant. This result contradict our expectation and the findings of Deruirgue-Kunt and Hizinga (1999), Ameur and Mhiri (2013) who support a negative relationship between banking activity and performance. The implication of our finding is that Nigerian banking assets contribution to GDP is low. There exist enough opportunities for the banks to increase their profits by expanding their operations in the rural areas.

Turning to the macroeconomic variables, the coefficient of the real GDP growth rate (RGDP) is positive but insignificant, suggesting that the effect of GDP on bank profitability is not important. This could be due to the fact that GDP growth is usually celebrated in Nigeria without any noticeable improvement in industrial production and the standard of living of the masses. As expected, inflation is negatively and significantly related to bank profitability.   While it is positively and insignificantly related to profitability in the NIM regression, the negative relationship in ROA and ROE are at 5% and 10% significant levels respectively. This suggests that Nigerian banks do not quickly and appropriately adjust their lending rates to reflect the increase in the general price level. As a result, they bear part of the cost of inflation on their profits. Finally, as predicted, interest rate (INTR) has a negative and significant impact on bank profitability. This suggests that an unanticipated increase in interest rate discourages bank customers from borrowing, increases borrowers' interest payments and thereby decreases their repayment ability. This finding is consistent with those of Gordon (1981), Wadhwani (1986) and Zeitun, Tian and Keen (2007) that interest rate has a negative impact on firm performance.

Conclusion

This study has investigated the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability in Nigeria. To achieve our aim, panel data regression is applied to data from central bank of Nigeria publications and the 10 banks' financial statements from

1998 to 2012. In particular, the Hausman test conducted favour the use of random-effects model. Our empirical results show that well capitalised banks have higher profits and that an increased exposure to credit risk reduces profits. Besides, bank size and productivity growth, have positive and significant impact on profitability, showing that increase in bank size and productivity growth will significantly enhanced profitability. Also, we found an evidence of a negative relationship between liquidity and profitability, supporting an established profitability-liquidity trade-off in finance theory. Furthermore, while deposit volume is positively and significantly linked to profitability, operating expenses have negative impact on profitability, implying that an aggressive deposit mobilisation with efficient expenses management are needed to increase Bank profits. Industry concentration and growth are found to have insignificant impact on profitability. Finally, out of the three macroeconomic variables, inflation and interest rate are found to have negative effect on profitability, while GDP growth has insignificant relationship with it.

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