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Department of Economics
Nnamdi Azikiwe University

Journal of Economic Studies

Volume 14

No. 1

March 2017

**Published by Department of Economics,
Nnamdi Azikiwe University, Awka.**



MICROECONOMIC AND MACROECONOMIC DETERMINANTS OF BANK PROFITABILITY IN NIGERIA

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Abstract

Development of the banking sector and increasing importance of banks' role in the economy has significantly led to an increase in bank-focused literature. To this end, this study investigated microeconomic (bank specific and industry-specific) and macroeconomic determinants of bank profitability in 16 Nigerian commercial banks for the period 2010 - 2014. Using the pooled ordinary least square regression method, microeconomic factors such as credit risk, capital adequacy, cost management efficiency, liquidity, size and market structure as well as macroeconomic factors such as gross domestic product and inflation rate were regressed against two measures of bank profitability (net interest margin and return on average assets). The results indicated that size, cost management efficiency, bank liquidity and market structure are significant microeconomic determinants of Nigerian commercial banks' profits while gross domestic product and inflation are the significant macroeconomic determinants with microeconomic factors having a higher explanatory power. Based on the findings, the study recommended that for Nigerian commercial banks'



earnings to improve, they should maintain a low cost profile, low liquidity level as well as growth in their operations. For policy makers and regulators in the industry, we recommended the sustaining of a low inflationary environment as well as growth in the economy for bank earnings to increase.

Keywords: Commercial banks, macroeconomics, Nigeria, panel data, profitability,

JEL Code: G21; O16

1.0 Introduction

Following banking sector development and an increase in the role played by banks in an economy, recent banking literature has focused more on factors that determine banks' profitability (Athanasoglou, Brissimis, & Delis 2008; Flamini, McDonald, & Schumacher, 2009; Chronopoulos, Liu, McMillian & Wilson, 2013; Dietrich & Wanzenried, 2011, 2014). The increase in literature on bank profitability was intensified further with the recent financial crisis (specifically the global financial crisis of 2007/2008) that had affected most banks globally. Commercial banks in Nigeria were not excluded from the global contagion effect of the crisis. For instance, profit before tax of Nigerian commercial banks in 2000 was 80.8% and rose to 287.62% in 2007. However, by the end of 2008, it had declined to 49.14% (Obamuyi, 2013). One of the reasons put forward for the decline by Obamuyi (2013) was the worsening effect of the financial crisis. The implication of a reduction in bank profit (subsequently growth and survival) is that it will eventually have an effect on the economic growth of an economy as postulated by finance-growth literature (Beck & Levine, 2004; Levine, 2005; Djalilov, & Piesse, 2011; Hassan, Sanchez, & Yu, 2011; Murinde, 2012). Hence, the need to investigate determinants of Nigerian commercial banks' profits taking into consideration the post financial crisis period and using recent data.

The present study goes further in the Nigerian banking literature by including a previously excluded industry-specific variable (market structure). Previous studies such as Ani, Ugwunta, Ezeudu, and Ugwuanyi, (2012); Babalola, (2012); Kolapo, Ayeni and Oke, (2012); Oladele, Sulaimon, and Akeke, (2012); Obamuyi, (2013); on Nigerian banks' profit determinants did not examine the effect of market structure on bank profitability thereby leaving out the effect of industry market share on profits. We also examined two profit



measures in one single study: Net interest margin and the more commonly used measure, return on average asset unlike previous studies examining only one measure.

The rest of the study is structured as follows; Section 2 gives a brief review of existing literature on determinants of bank profitability. Section 3 outlines the methodology employed in the study which covers the theoretical and empirical framework. Section 4 presents empirical results and discussion while Section 5 concludes with relevant industry and policy recommendations.

2.0 Literature Review

Early literature on bank profit determinants can be traced to Short (1979) who investigated the profitability of banks in Canada, Western Europe and Japan. Follow-up research has subsequently focused on cross-country (Demirguc-Kunt & Huizinga, 1999; Goddard, Molyneux & Wilson, 2004; Staikouras & Wood, 2004; Micco et al., 2007; Pasiouras & Kosmidou, 2007; Flamini et al., 2009; Dietrich & Wanzenried, 2014) and country-specific studies (Molyneux & Thornton, 1992; Naceur & Goaied, 2003; Park & Weber, 2006; Athanasoglou et al., 2008; Kosmidou, 2008; Liu & Scully, 2008; Sufian, 2009; Alper & Anbar, 2011; Dietrich & Wanzenried, 2011). These studies identified important determinants of bank profitability categorised into endogenous (bank and industry specific) and exogenous (external variables that reflect the type of environment in which banks operate) variables.

Bank-specific determinants include credit risk, capital adequacy, bank size, cost management efficiency, liquidity, managerial ability and other factors that originate from bank operations. Exogenous factors include market (financial) structure and macroeconomic conditions such as inflation rate, interest and exchange rates, gross domestic product among others that are usually due to regulatory and monetary authorities. For example, Athanasoglou et al. (2008); Kosmidou (2008) identified a positive relationship between inflation, gross domestic product and bank profitability for banks in Greece.

Regarding market structure and according to structure-conduct-performance (SCP) (market-power) hypothesis, monopoly profits are made from an increase in market power (Dietrich & Wanzenried, 2014). Empirical evidence observed in Liu and Scully (2008):



Molyneux and Thornton (1992); Demirguc-Kunt and Huizinga (1999) support this view with the studies identifying a statistically positive significant relationship between market structure and profitability. Nonetheless, Naceur and Goaied (2003); Park and Weber (2006) in contrast to the SCP hypothesis, identified a significant and negative relationship between market structure and bank profitability for Tunisian and Korean banks respectively. It is important to note that results obtained from these several cross-country and country-specific studies vary due to differences in datasets, financial and macroeconomic environments and method of analysis used. Nevertheless, they have been able to highlight important variables that affect bank profitability and can be generalised to economies with similar institutions/operating environments.

Studies on determinants of bank profitability in the Nigerian context include Obamuyi (2013); Babalola (2012) who investigated the effect of bank-specific and macroeconomic variables on bank profit. Obamuyi (2013) analysed the effect of bank capital, bank size, expense management, interest income and the economic condition on banks' profitability in Nigeria. The study found that improved bank capital, interest income, efficient expenses management and a favourable economic condition, are important determinants of Nigerian banks' profits. Babalola (2012) identified capital adequacy ratio as the only determining factor for banks' profitability in Nigeria. Investigating only bank-specific variables, Ani et al. (2012) showed that bank size, capital and asset composition are important determinants of bank profitability in Nigeria. Similarly, Oladele, Sulaimon and Akeke (2012) found that operating expense, the cost to income ratio and equity to total assets significantly affects bank profitability in Nigeria. Focusing on credit risk aspect of endogenous determinants, Kolapo, Ayeni and Oke (2012) provided empirical evidence showing that increased credit risk negatively affects bank profitability.

A common feature revealed during the review of the above-mentioned Nigerian literature on bank profitability is the use of return on average assets as the proxy for bank profit. The present study builds on extant literature by investigating two measures at the same time namely net interest margin and return on average assets (the difference between these two are highlighted in Section 3.2.1). Furthermore, in addition to commonly used variables, we include market structure (excluded in previous studies) as an industry-specific variable to investigate the determinants of bank profit in Nigeria.

3.0 Methodology

3.1 Theoretical Framework

The present study is hinged on three theories. These include structure-conduct-performance (SCP), capital buffer and market efficiency theories. The SCP theory links the market structure of the bank to profits. It asserts that increased market power yields monopoly profits. Furthermore, only firms with large market shares and well-differentiated products are able to exercise market power and earn non-competitive profits (Athanasoglou et al., 2008; Berger, 1995; Dietrich & Wanzenried, 2014). To explain the effect of bank capital and liquidity on profits, the capital buffer theory is applied. On one hand, Diamond and Rajad (2000) argued that increased bank capital ratio inhibits the liquidity position of banks which in turn lowers profit (Dietrich & Wanzenried, 2011). On the other hand, banks with high capital ratios are viewed as relatively safer banks thereby increasing deposit liabilities which can be lent out as loans with interest income earned thereby increasing profits (Kosmidou et al., 2008). The efficient structure theory is applied to cost management efficiency and predicts an inverse relationship with bank profit because improved management of expense increase efficiency and therefore raise profits i.e. the lower the expense, the higher the profit (Athanasoglou et al., 2008).

3.2 Variable Selection

Drawing from the theoretical framework, we describe the variables used in the study in terms of microeconomic (bank-specific and industry-specific) and macroeconomic variables. Table 3.1 presents a summary of the various variable definitions and source.

3.2.1 Dependent Variables

We use net interest margin (NIM) and return on average assets (ROAA) as proxies for profitability of the banks and as dependent variables. The use of these variables enables us to compare and determine whether the determinants of the proxies are similar or different. The first measure of profitability, NIM is measured as yearly net interest income divided by average earning assets and focuses on income earned from interest activities (Dietrich & Wanzenried, 2014). It also helps to gauge the cost of financial intermediation (Brock & Suarez, 2000). The second proxy, ROAA, emphasises capability of bank management to earn income from bank's assets. In addition, it shows income earned per unit of asset and



indicates how well the assets are managed to earn income (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2014). We measure ROAA as annual pre-tax profit divided by average assets.

3.2.2 Independent Variables

Bank-specific variables: We select five bank-specific variables namely credit risk, capital adequacy, cost management efficiency, bank liquidity and size from previous research on determinants of bank profitability (Demirguc-Kunt et al., 2004; Pasiouras & Kosmidou, 2007; Athanasoglou et al., 2008; Dietrich & Wanzenried, 2014).

i. **Credit Risk:** Credit risk is proxied with loan loss provisions (LLRGL) measured as the annual ratio of loan loss reserves to gross loans. LLRGL indicates the portion of loan portfolio that has been provided for but not written off. Inferring from the risk-return hypothesis, high (low) ratios with good (poor) asset quality in place suggests a positive (negative) relationship with profitability (Kosmidou, 2008). The Theory similarly suggests that an increased credit risk exposure is associated with reduced bank profitability (Dietrich & Wanzenried, 2014).

ii. **Capital Adequacy:** Capital adequacy is proxied by the ratio of equity to total assets (ETA) and indicates bank's capital strength. Generally, banks with high capital ratios are considered safer than those with low capital ratios and thus more operations to earn higher income (Athanasoglou et al., 2008; Dietrich & Wanzenried, 2014). Accordingly, we expect a positive relationship between equity to assets ratio and bank profitability. In addition, because banks with higher equity-to-assets ratios usually have reduced external funding requirements, we also expect a positive relationship with profitability.

iii. **Cost Management Efficiency:** We proxy cost management efficiency with the ratio of cost to income (CIR) and is calculated as annual operating costs divided by total income earned by the bank. CIR reflects the efficiency of bank management on profitability (Pasiouras & Kosmidou, 2007). Consequently, we expect a negative relationship between profitability and CIR.

iv. **Bank Liquidity:** We use the ratio of net loans to deposits (NLDP) as the proxy for bank liquidity and it reflects the relationship between loans and sources of funding (e.g. deposits and short-term funding). Deposits provide liquidity and funding to banks

without which banks may become technically insolvent. Therefore, in insolvency, banks will hold liquid assets (Passouras & Konnidon, 2007). (lower) ratios of NLDP suggest lower (higher) liquidity levels. However, liquid assets are often associated with reduced profits, we expect a positive association between NLDP and bank profit. In the case of specialized lending, research suggests higher NLDP may indicate the use of informational advantages which may reduce intermediation costs and increased profitability (Fomara, Chronopoulos et al., 2015). Similarly, banks with a higher proportion of deposits may be unable to invest in assets that yield high returns in line with the maturity mismatch hypothesis. This implies reduced profit for the banks. Thus, the expectation of bank profit with bank liquidity is not clear.

v. **Bank Size.** We use bank total asset to proxy bank size and it is calculated as the natural logarithm of total assets (LNTOT). The expectation is that bank profit increases with size due to economies of scale and cost reduction suggesting a positive relationship. Nonetheless, banks that become too big may be faced with diminishing returns, bureaucratic and management problems (Athanasoglou et al., 2008; Demirgüç-Kunt et al., 2004). In addition, smaller banks may charge higher interest rates for loans to more risky customers and translates to higher profitability (Chronopoulos et al., 2015). These two scenarios imply a negative relationship with bank profitability.

vi. **Industry-specific variable:** The industry-specific variable used is market structure. We proxy market structure with bank concentration ratio (CON) and it is calculated as the ratio of the three largest banks' assets to the assets of all banks in the market. This ratio reflects the extent to which few big banks dominate the banking industry (for Weber, 2006). The Structure-Conduct-Performance (SCP) hypothesis suggests that banks in highly concentrated markets tend to face less competition, set prices that are less favourable to customers and collude therefore earning monopoly profits (Areeda & 1984). Conversely, the hypothesis explains that efficient banks incur lower costs thereby earning higher revenue. Consequently, such banks are able to grow their market share making the banking industry more concentrated. Nevertheless, bank concentration may be due to intense competition in the industry, implying an inverse relationship between profitability and bank concentration (Bartlett & Weigand, 2008).

Macroeconomic Variables: To capture the effect of macroeconomic indicators on



profitability, we use two commonly used variables in previous research namely: gross domestic product and inflation.

- i. **Gross domestic product:** Gross domestic product (GDP) captures overall economic activity and business cycle fluctuations in an economy. We use annual growth rate of real gross domestic product as our proxy for GDP. A booming economy should translate into higher bank profit and vice-versa thus implying a positive relationship between GDP and bank profit. Similarly, during periods of bad economic conditions, loan quality may deteriorate and may lead to credit losses, which lower bank's profits (Athanasoglou et al., 2008; Bikker & Ha, 2002).
- ii. **Inflation:** Anticipation of inflation by banks and making timely adjustments to interest rates ensure that operating expenses do not increase faster than inflation rate thus improving profits profitability (Bourke, 1989; Molyneux & Thornton, 1992; Pasiouras & Kosmidou, 2007). The reverse is the case with non-anticipation of inflation because costs increase faster than income.



Table 3.1: Variable Definition and Sources

	Definition	Source	Expected Relation
<i>Dependent Variables</i>			
Net Interest Margin (NIM)	Annual net interest income divided by average earning assets (%)	Bankscope Database	
Return on Average Assets (ROAA)	Annual pre-tax profit divided by average assets (%)	Bankscope Database	
<i>Bank-specific Variables</i>			
Loan Loss Provisions (LLRGL)	Annual ratio of Loan loss reserves to gross loan (%)	Bankscope Database	+ / -
Equity to Total Assets (ETA)	Annual ratio of equity to total assets (%)	Bankscope Database	+ / -
Costs to Income Ratio (CIR)	Annual overheads incurred divided by total income (%)	Bankscope Database	-
Net Loans to Deposits (NLDP)	Annual ratio of net loans to customer deposits and short-term funding (%)	Bankscope Database	+ / -
Size (LNTOT)	Natural log of annual total assets of bank	Bankscope Database	+ / -
<i>Industry-specific Variable</i>			
Concentration (CON)	Annual ratio of the three largest banks' assets to the assets of all banks in the study (%)	Authors' Calculation from values obtained from Bankscope Database	+ / -
<i>Macroeconomic Variables</i>			
Gross Domestic Product (GDP)	Annual growth rate of real gross domestic product (%)	World Bank Development Indicator Database	+ / -
Inflation (INF)	Annual inflation rate (%)	World Bank Development Indicator Database	+ / -

Source: Authors' Compilation



3.3 Model Specification and Technique of Analysis

Drawing from the theoretical framework and variable selection, bank profit is modelled as a function of various microeconomic and macroeconomic determinants as shown in equation 3.1

$$Z_{it} = \beta_0 + \beta_1 LLRGL_{it} + \beta_2 ETA_{it} + \beta_3 CIR_{it} + \beta_4 NLDP_{it} + \beta_5 LNTOT_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \beta_8 CON_{it} + \varepsilon_{it} \quad 3.1$$

Where Z is the dependent variable (NIM and ROAA), β_0 is the intercept of the slope, $\beta_1 - \beta_8$ are coefficients of variables outlined in Table 3.1, i and t refers to individual bank and time respectively, ε is the error term.

Noting that the data consists of both cross-sectional and time series value (panel data), our choice of research method to estimate the determinants of bank profitability for Nigerian commercial banks is between pooled ordinary least squares (POLS) and generalised least squares (GLS) estimator. Consequently, we run the Breush Pagan (BP) or Lagrangian Multiplier (LM) test to determine whether to use POLS or GLS. We report the F-statistics to show the joint significance and model fit of the regressors in the equation. Thereafter, we run the Hausman test to decide whether to use random effects or fixed effects estimation procedure. Robustness checks are conducted to rule out the possibility of the results being driven by extreme values (such as outliers) in both microeconomic and macroeconomic data (Dietrich & Wanzenried, 2014). This is done through the re-estimation of equation 3.1 by separately regressing the dependent variables (NIM and ROAA) against microeconomic and macroeconomic determinants as shown in equations 3.2 and 3.3 respectively.

$$Z_{it} = \beta_0 + \beta_9 LLRGL_{it} + \beta_{10} ETA_{it} + \beta_{11} CIR_{it} + \beta_{12} NLDP_{it} + \beta_{13} LNTOT_{it} + \beta_{14} CON_{it} + \varepsilon_{it} \quad 3.2$$

$$Z_{it} = \beta_0 + \beta_{15} GDP_{it} + \beta_{16} INF_{it} + \varepsilon_{it} \quad 3.3$$

Where Z is the dependent variable (NIM and ROAA), β_0 is the intercept of the slope, $\beta_9 - \beta_{16}$ are coefficients of the variables, i and t refers to individual bank and time respectively, ε is the error term. We compare the two results to determine if both are quantitatively and qualitatively similar. If the results are similar, we may then conclude that the results are robust to different specifications of profitability measures for the present study.

3.4 Data

The data set consists of an unbalanced panel of 16 Nigerian commercial banks whose annual financial statements are available in Bankscope Data base. Annual macroeconomic variables are sourced from World Bank Development Indicator Data base. The data period is guided by data availability in Bankscope which started from 2010 for Nigerian Banks and ended in 2014. This gives 80 annual bank-level observations. Bank and industry-specific data are obtained from consolidated statements in Bankscope to remove duplicate information that may be due to mergers and acquisitions suggesting that not all banks enter the sample at the same time during the period of study. To guard against small cross-sectional variations, we follow the approach of Vithessonthi (2014) and include only banks with at least three years observation.

4.0 Empirical Results and Discussions

4.1 Descriptive Statistics

A review of Table 4.1 shows that over the period of the study, the average of the net interest margin (NIM) was higher at 7.031% than that of average assets (ROAA) for the sample of banks at 1.486%. Furthermore, NLDP was the most volatile of all the variables at 28.46% while the least volatile was CON at 4%. This is not surprising because NLDP is an indicator of the relationship between loans and sources of funding. The LLRGL variable which indicates the quality of the credit portfolio, has a mean of 6.65% with a standard deviation of 7.09%, a value lower than the NLDP. The mean and volatility value of CIR which stands at 79.85% and 27.37% implies the likelihood of CIR impacting heavily on profits consistent with the assertion of Dietrich and Wanzenried (2014) that banks in low-income countries do not have cost advantages. We do not observe much variation in the standard deviation of the macroeconomic variables; GDP and INF; given as 1.07% and 2.02% respectively. We note that issues common to corporate finance studies such as non-normality of data, heteroscedasticity and outliers (observed from the minimum and maximum values) may be present in our data. To minimise the effect of these issues, we estimate the regression equation with robust standard errors (Frank & Goyal, 2008; Verardi & Croux, 2009).

¹Bankscope is a global financial database that reports comprehensive financial statements for banks worldwide including ratings, country risk, detailed bank structures and country finance reports among other financial reports. The list of banks used in this study is in Appendix 1.



Table 4.1: Descriptive Statistics, 2010-2014 (%)

Variable	Mean	Standard Dev.	Minimum	Maximum
NIM	7.031	2.477	1.805	12.198
ROAA	1.486	2.523	39.316	173.744
LLRGL	6.648	7.089	0.19	43.64
ETA	13.759	6.948	-12.08	29.67
CIR	79.847	27.373	39.316	173.744
NLDP	49.129	28.456	5.566	228.463
LNTOT	8.564	0.999	6.167	10.1
GDP	5.493	1.072	4.279	7.84
INF	10.258	2.023	8.057	13.72
CON	0.479	0.041	0.448	0.591

This table reports summary statistics for the sample of banks in the study over the period 2010 -2014.

See Table 3.1 for variable description and measurement.

To test for multicollinearity, we use results obtained from the pairwise correlation analysis reported in Table 4.2. Coefficients of variables in the pairwise correlation analysis showed that the explanatory variables have values that are below 0.80 in both Panels A and B suggesting that multicollinearity does not pose a problem in this study. According to Studenmund (2006), values that exceed 0.80 indicate the possibility of multicollinearity.

Table 4.2: Pairwise Correlation Analysis

Panel A									
Variables	NIM	ROAA	LLRGL	ETA	CIR	NLDP	LNTOT	GDP	INF
NIM	1.000		0.181	-0.017	-0.127	0.049	0.473***	0.061	0.066
ROAA	0.168	1.000	-0.404***	0.401**	-0.559***	0.063	0.158	0.087	-0.063
Panel B									
Variables	LLRGL	ETA	CIR	NLDP	LNTOT	GDP	INF	CON	
LLRGL	1.000								
ETA	-0.290**	1.000							
CIR	0.452**	-0.389**	1.000						
NLDP	-0.156	-0.068	-0.283**	1.000					
LNTOT	-0.289**	-0.122*	-0.241*	0.350***	1.000				
GDP	0.019	0.054	-0.053	0.114	0.167	1.000			
INF	0.249**	-0.133	0.019	0.083**	-0.018	-0.082**	1.000		
CON	0.104	0.006	-0.052	0.139	0.167	0.536***	0.273**	1.000	

Panel A of this table presents results of pairwise correlation analysis between the dependent and independent variables as defined in Table 3.1 while Panel B presents results of pairwise correlation analysis between the independent variables. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.

4.2 Panel Regression Results

Having confirmed the absence of multicollinearity through an examination of coefficients pairwise correlation analysis, we run POLS regression for equation 3.1. Table 4.3 presents empirical results of the POLS regression for variables defined in Table 3.1. Concerning diagnostic tests for the model, the explanatory power (adjusted R^2) of the NIM model 0.274 is observed to be lower than the ROAA model at 0.846. Nonetheless, F-statistics (Wald test) testing the model fit and joint significance of variables in the two models are significant at 1% level of significance suggesting that regression coefficients are non-zero and jointly significant. The coefficient of Ramsey reset test for omitted variable is not significant in both models indicating that they do not suffer from omitted variable bias. Results in Table 4.3 also indicate that the determinants of NIM and ROAA differ for the banks in the study. For example in terms of bank-specific variables, bank size (LNTOT) is the only significant factor for NIM while cost-to income ratio (CIR) and net loans to deposits (NLDP) are important determinants for ROAA. Concentration (CON) is a significant industry factor that affects bank profits. For the macroeconomic variables, we observe that gross domestic product (GDP) and inflation (INF) are important determinants for ROAA.

The positive and statistically significant effect of bank size (LNTOT), which is the only important determinant for NIM, suggests that Nigerian commercial banks use economies of scale to increase profitability. This is consistent with previous studies assertion and our expectation that bank profit increase with size due to economies of scale and cost reduction (Obamuyi, 2013; Athanasoglou et al., 2008; Pasiouras & Kosmidou, 2007). For the ROAA dependent variable, cost-to-income ratio and net loans to deposits ratio are both negative and statistically significant in line with studies that show that increased costs and lower loans to deposits reduce bank profits (Athanasoglou et al., 2008; Obamuyi, 2013; Dietrich & Vanzenried, 2011; 2014). The inverse relationship between cost-to-income and profitability further confirms the efficiency hypothesis that efficiently managed banks incur fewer costs which improves profit position unlike inefficiently managed ones. Likewise, the negative and statistically coefficient for the liquidity variable (NLDP) is in line with our expectation that higher liquidity lowers bank profit. These results are in line with the theoretical expectations (structure-conduct-performance (SCP), capital buffer and market efficiency theories).

Table 4.3 shows that macroeconomic variables are only significant in the regression equation for ROAA. Gross domestic product and inflation have negative and statistically significant coefficients, while that of concentration ratio is positive and statistically significant. The negative effect of gross domestic product confirms declining economic conditions, which lower bank profits and may be due to declining loan quality. Furthermore, the non-anticipation of inflation rate over the study period by the banks in the study implies that costs increased faster than bank revenue also supporting the result of a decline in economic activity. It is also worthy to note that over the period of the study, gross domestic product in Nigeria was on a decline while inflation rate increased. These results are consistent with previous research such as Ongore and Kusa (2013) for a sample of Kenyan banks, another developing economy in Africa. Market structure (CON) indicates the presence of monopoly profits as observed in the positive and statistically significant coefficient of concentration ratio, consistent with the structure-conduct-performance hypothesis. We do not find the result of the positive relationship surprising given the nature of the banking landscape in Nigeria. Over the years, the industry has been dominated by a few big banks (First Bank Plc, United Bank for Africa, Guaranty Trust Bank and Zenith Bank) thus having a larger fraction of the Nigerian banking industry shares.

Table 4.3: Pooled OLS Regression Results

Dependent Variable	NIM	ROAA
Constant	-112.792 (128.236)	-145.657** (66.169)
LLRGL	0.029 (0.083)	0.050 (0.031)
ETA	0.003 (0.060)	0.029 (0.028)
CIR	-0.006 (0.013)	-0.087*** (0.009)
NLDP	-0.001 (0.012)	-0.016*** (0.004)
LNTOT	1.219*** (0.292)	0.048 (0.106)
GDP	-19.705 (23.344)	-27.947** (12.117)
INF	-3.733 (4.519)	-5.510*** (2.351)
CON	536.529 (631.089)	758.269** (327.050)
Adjusted R ²	0.274	0.846
Ramsey Reset	2.43	0.67
F-statistics	3.03***	39.56***
Banks Included	16	16
Observations	80	80

Robust standard errors are reported in parentheses. ** and *** denote significance at 5% and 1% levels respectively.

4.3 Robustness Test: Microeconomic Versus Macroeconomic Variables

We present the results for the robustness test in Tables 4.4 and 4.5 where we ran separate regression equations for microeconomic and macroeconomic variables. The results when compared to those in Table 4.3 showed that signs and coefficients of variables in both tables are quantitatively similar. The similarity in the results indicates the robustness of the regression equations as earlier explained in the model specification. An important



observation in Tables 4.4 and 4.5 is the higher explanatory power (adjusted R^2) of microeconomic variables over macroeconomic variables. Overall, the results suggest that endogenous determinants affect bank profitability more than exogenous ones.

Table 4.4: Robustness Test for Microeconomic Variables

Dependent Variable	NIM	ROAA
Constant	-2.816 (3.298)	7.311*** (1.599)
LLRGL	0.029 (0.078)	0.031 (0.034)
ETA	0.018 (0.058)	0.039 (0.028)
CIR	-0.007 (0.013)	0.086*** (0.010)
NLDP	-0.010 (0.012)	-0.015*** (0.004)
LNTOT	1.229*** (0.293)	0.044 (0.108)
CON	464.142 (694.058)	1669.261** (726.948)
Adjusted R^2	0.258	0.823
F-statistics	4.95***	38.73***
Banks Included	16	16
Observations	80	80

Robust standard errors are reported in parentheses. *** denotes significance at 1% level.

Table 4.5: Robustness Test: Macroeconomic Variables

Dependent Variable	NIM	ROAA
Constant	-89.691 (140.008)	336.349** (146.809)
GDP	-16.906 (25.730)	-61.624** (26.918)
INF	-3.176 (4.978)	-11.984** (5.222)
Adjusted R ²	0.021	0.094
F-statistics	0.70	1.96*
Banks Included	16	16
Observations	80	80

Robust standard errors are reported in parentheses. *, ** denote significance at 10% , 5% levels respectively.

4.4 Generalised Least Square Regression Results (Net Interest Margin)

After estimating Equation 3.1 with the POLS, we run the Breusch and Pagan Lagrange multiplier test to determine whether Equation 3.1 is best estimated with POLS or GLS both NIM and ROAA. The results indicate that the null hypothesis of no random effect is rejected at 5% significance level with ROAA (Prob > chi2 = 0.864) while NIM is rejected at 5% level of significance (Prob > chi2 = 0.000). Thereafter, we run the Hausman test to decide on the use of fixed effects or random effects for NIM. Results of the Hausman test indicate the absence of fixed effects through the non-significance of the chi² statistics (Prob > chi2 = 0.163). Consequently, Table 4.6 reports results of the NIM random effects GLS regression equation.



Table 4.6: GLS Regression Results (NIM): Random Effect

Dependent Variable	NIM
Constant	19.519 (82.744)
LLRGL	-0.073 (0.047)
ETA	-0.018 (0.075)
CIR	-0.033*** (0.011)
NLDP	-0.012 (0.012)
LNTOT	0.303 (0.545)
GDP	2.538 (15.143)
INF	0.613 (2.928)
CON	-66.183 (408.912)
Adjusted R ²	0.351
F-statistics	19.52**
Banks Included	16
Observations	80

Robust standard errors are reported in parentheses. ** and *** denote significance at 5% and 1% levels respectively.

Table 4.6 shows that cost to income ratio is the only important microeconomic determinant using random effects method (-0.033***). This implies that increase in cost to income leads to a reduction in bank profitability consistent with previous studies. However, we are unable to compare the results of Table 4.6 with results presented in Table 4.3 for pooled ordinary least square regression due to the different methods employed. Nonetheless, the finding of an inverse relationship between NIM and management cost efficiency is in line with previous studies as detailed in Section 3.2.2.

5.0 Conclusion and Recommendations

The increasing importance of the role played by the banking sector in the economy has led to an increase in research which examines various aspects of the industry. Contributing to extant research, this study examined microeconomic and macroeconomic determinants of bank profitability in the Nigerian banking industry. We utilised annual bank-level, industry-specific and macroeconomic variables over the period 2010 – 2014 for 16 Nigerian commercial banks to determine important factors that affect bank profitability. Results from pooled ordinary least squares regression and robustness tests indicate that management efficiency and bank liquidity are major bank-specific variables that have inverse and significant effects on bank profits. In terms of macroeconomic factors, the economic condition and inflation rate negatively affects bank profitability in Nigeria. However market structure and bank size both have positive and significant effects on bank earnings. In addition, microeconomic variables were found to have higher explanatory powers than macroeconomic variables. These findings reveal important implications for banks and policy makers. The first is that bank management need to maintain a liquidity level that will increase and not decrease profit. In addition banks need to have a low cost profile in order to have increased revenues. On the part of policy makers, the results show that a favourable economic environment and lower inflation rate promotes bank growth and survival through increased earnings. Hence the need to put in place a conducive macroeconomic environment through the design of favourable economic policies. For instance, monetary authorities may implement monetary policy measures such as maintaining the monetary policy rate (MPR) at a level that curbs inflationary pressure in the system. Another measure is to promote growth in the economy to increase the nation's income which may be through increase in exports. In terms of market structure, the study also reveals the need to eliminate monopoly profits as shown by the market structure variable, a variable hitherto excluded in previous studies. This can be done by implementing banking reforms that encourage competition among banks.

Future research may build on the limitations in this study. One is investigating the effects of other macroeconomic variables like money supply, interest and exchange rates on bank profit. Second, a longer time span for the data may be obtained to determine the existence of any co-integration relationship between the variables.



References

- Ani, W., Ugwunta, D., Ezeudu, I., & Ugwuanyi, G. (2012). An empirical assessment of the determinants of bank profitability in Nigeria: bank characteristics panel evidence. *Journal of Accounting and Taxation*, 4(3), 38.
- Athanasoglou, P.P., Brissimis, S.N., & Delis M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions & Money*, 18, 121-136.
- Babalola, Y. A. (2012). The determinants of bank's profitability in Nigeria. *Journal of Money, Investment and Banking*, 24, 6-16.
- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: panel evidence. *Journal of Banking & Finance*, 28(3), 423-442.
- Ben Naceur S. & M. Goaied (2003). *The determinants of the Tunisian banking industry profitability: panel evidence*. Paper presented at the Economic Research Forum (ERF) 10th Annual Conference, Marrakesh-Morocco, 16-19 December.
- Berger, A. (1995). The profit-structure relationship in banking: Tests of market-power and efficient-structure hypotheses. *Journal of Money, Credit and Banking*, 27(2), 404-431.
- Bikker, J., & Hu, H. (2002). Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the new Basel capital requirements. *Banca Nazionale del Lavoro Quarterly Review*, 221, 143-175.
- Boone, J., & Weigand, J. (2000). Measuring competition in the Dutch manufacturing sector: how are cost differentials mapped into profit differentials? *CPB Working Paper No. 131*.
- Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 13, 65-79.
- Brock, P. & Rojas-Suarez, L. (2000). Understanding the behaviour of bank spreads in Latin America. *Journal of Development Economics*, 63, 113-34.
- Chronopoulos, D. K., Liu, H., McMillan, F. J., & Wilson, J. O. (2015). The dynamics of US bank profitability. *The European Journal of Finance*, 21(5), 426-443.
- Demirguc-Kunt, A. & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13, 379-408.

- Demirguc-Kunt, A., Laeven, L., and Levine, R. (2004) Regulations, market structure, institutions, and the cost of financial Intermediation. *Journal of Money, Credit and Banking*, 36(3), 593 - 622
- Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, 21(3), 307-327.
- Dietrich, A., & Wanzenried, G. (2014). The determinants of commercial bank profitability in low-, middle-, and high-income countries. *The Quarterly Review of Economics and Finance*, 54(3), 337-354.
- Djalilov, K., & Piesse, J. (2011). Financial development and growth in transition countries: a study of central asia. *Emerging Markets Finance & Trade*, 47(6), 4 -23.
- Frank, M. Z., & Goyal, V. K. (2008). Trade-off and pecking order theories of debt. In Eckbo (Ed.), *Handbook of empirical corporate finance*. 2, (135-202) North Holland: Elsevier B.V.
- Freixas, X. (2005). Deconstructing relationship banking, *Investigaciones Economicas*, 3-31.
- Flamini, V., McDonald, C., & Schumacher, L. (2009). The determinants of commercial bank profitability in Sub-Saharan Africa. *IMF Working Paper No. 09/15*.
- Goddard, J., Molyneux, P., & Wilson, J. (2004). The profitability of European banks: A cross-sectional and dynamic panel analysis. *Manchester School*, 72(3), 363-381.
- Hassan, M. K., Sanchez, B., & Yu, J.-S. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance*, 51, 88-104.
- Kolapo, T. F., Ayeni, R. K., & Oke, M. O. (2012). Credit risk and commercial bank performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research*, 2(2), 31-38.
- Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of financial integration. *Managerial Finance*, 34(3), 146-159.
- Levine, R. (2005). Finance and growth: Theory and evidence. *Handbook of Economic Growth*, 1, 865-934.
- Liu, B. & Scully, M. (2008). The impact of securitisation and structural changes of Australian mortgage markets on bank pricing behaviour. *International Journal of Banking, Accounting and Finance*, 1(2), 149 - 167.



- licco, A., Panizza, U., & Yanez, M. (2007). Bank ownership and performance. Does politics matter? *Journal of Banking and Finance*, 31(1), 219-241.
- Polynieux, P., & Thornton, J. (1992). Determinants of European bank profitability: A Note. *Journal of Banking and Finance* 16, 1173-1178.
- Murinde, V. (2012). Financial development and economic growth: global and African evidence. *Journal of African Economies*, 21(1), i10-i56.
- Obamuyi, T. M. (2013). Determinants of banks' profitability in a developing economy: evidence from Nigeria. *Organizations and Markets in Emerging Economies* (2), 97-111.
- Oladele, P. O., Sulaimon, A. A. & Akeke, N. I. (2012). Determinants of bank performance in Nigeria. *International Journal of Business and Management Tomorrow*, 2(2), 1-4.
- Longore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues*, 3(1), 237.
- Mark, K.H. & Weber, L. (2006). Profitability of Korean banks: test of market structure versus efficient structure. *Journal of Economics and Business*, 58, 222-239.
- Asiouras, K. & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21, 222-237.
- Thornton, B. (1979). The relation between commercial bank profit rates and banking concentration in Canada, Western Europe and Japan. *Journal of Banking and Finance*, 3(3), 209-219.
- Asiouras, C., & Wood, G. (2004). The determinants of European bank profitability. *International Business and Economics Research Journal*, 3(6), 57-68.
- Wooldridge, A.H. (2006). *Using Econometrics, A practical Guide, Fifth Edition*. Pearson Addison: Wesley
- Ufian, F. (2009). Factors influencing bank profitability in a developing economy: empirical evidence from Malaysia. *Global Business Review*, 10(2), 225-241.
- Gerardi, V., & Croux, C. (2009). Robust regression in Stata. *Stata Journal*, 9(3), 439-453.
- World Bank
- Withessonthi, C. (2014a). The effect of financial market development on bank risk: evidence from Southeast Asian countries. *International Review of Financial Analysis*, 35, 249-260