

BANK PROFITABILITY AND ECONOMIC PERFORMANCE NEXUS IN NIGERIA: A PANEL ANALYSIS

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Abstract: The study examined the nexus between economic performance and profitability of banks in Nigeria using annual panel data spanning the period of 2005 – 2017. Specifically, it examined the relationships between macroeconomic variables and bank profitability in Nigeria; the magnitude of impact between traditional and alternative measures of economic performance on bank profitability measures in Nigeria. The study employed the fixed effect panel regression technique and the panel Granger causality test to achieve the objectives. Findings revealed that there exists a weak correlation between macroeconomic variables and bank profitability. It was equally found out that a uni-causal relationship exists between foreign direct investment net inflow growth rate (FDIG) and Return on Assets (ROA), ROA and inflation rate (INF). Also, it was found that interest rate (IR) had a significant impact on return on asset, whereas operational efficiency (OPE) and EXR were found to be negatively related to return on asset. Capital adequacy ratio (CAD) was also found to be significant and positively related to ROA. Based on the size of the coefficients, FDIG, OPE and IR was found to exert more impact on bank profitability in Nigeria, than the alternative measure (MCAPG) and other traditional measures of economic performance. Thus, based on the findings it was recommended that government through fiscal and monetary policy measures should ensure that FDI driven policies are pursued and optimal interest rate that is appealing to both lenders and borrowers implemented.

Keywords: Economic Performance; Market Capitalization; Fixed effect panel regression.

JEL: Classification: C21, C23, E02, G21

1. INTRODUCTION

Banks act as agents of economic development by mobilizing funds on behalf of the federal, state and local governments via the sales of bonds and treasury bills. They

provide loans to businesses, organizations and individuals. They hold securities, which they term as “asset”. They also borrow from other banks and corporate organizations and carry out money market transactions, this they term “liabilities”. They earn the bulk of their revenue from performing these intermediation functions by way of interest margin. Thus, in order to ensure that their assets exceed their liabilities, they employ risk assets management techniques, human capital and operational efficiency and monitor the economy closely; as failure to do so results in poor returns, bad and non-performing loans, which can have serious consequences, as well as impair depositors (savings and fixed deposit) whom they pay returns to, as opportunity cost for their savings.

Also, banks act as a conduit for monetary policy transmission. They provide a veritable platform for monetary policy implementation, such as exchange rate policies, credit policies and other policies related to the financial sector. A frail and weak financial sector will significantly impair economic growth and vice versa. When repressed, the banking sector can retard economic growth, especially when its deposit vehicles are repressed. Moreover, a profitable banking sector can withstand negative shocks and contribute to the stability of the financial system.

A major motivation to undertake this study stems from the economic performance and bank profitability controversies and lack of clarity. The financial reports by banks in Nigeria revealing that banks make profits even in worse conditions have made it increasingly difficult to pinpoint the relationship that subsists between the banking sector and the economy. Thus, one cannot state categorically that economic performance Granger causes bank profitability and vice versa. On the other hand, some studies link the profitability of banks to internal economic factors, arguing that bank profitability is not closely tied to external macroeconomic conditions alone. However, the massive downsizing in recent time in the banking sector which has overtime earned the reputation of the highest annual recruitment sector, employing skilled, semi-skilled and unskilled individuals respectively is an indication or a reflection that external macroeconomic factors may have a gross impact on the sector. Poor economic condition is adjudged to reduce the rate of deposit, and since deposits are transformed into loans, which earn interest, poor economic conditions are likely to affect the overall deposits, loans and invariably the profitability of banks.

Also, recent 2018 half-year economic review by CBN, which revealed that the macroeconomic conditions reflected in decreasing rate of inflation, steady exchange rate and gradual rise in GDP (1.9% and 1.5% growth rate of GDP recorded in the first and second quarters respectively), translated to a slight improvement in the banking sector. A significant development in liquidity ratio, capital adequacy ratio, and asset quality was observed, as the industry was able to meet the industry capital adequacy

ratio threshold of 15.0% for internationally authorized banks and 10.0% for nationally or regionally authorized banks. The 5.0% threshold for the ratio of non-performing loans to total loans and the 30.0% minimum regulatory liquidity ratio for commercial banks, 20.0 per cent for merchant banks, and 10.0 per cent for non-interest banks was observed. The average industry capital adequacy ratio (CAR) of 12.8%, improved compared to 11.51% and 10.23% in 2017; June and December respectively, while the non-performing loans to total loans ratio fell to 12.45% in June 2018, compared to 15.02% and 14.80% at the end of June and December 2017 respectively (Komolafe and Adegbesan, 2018).

More so, prior to the recession of 2016, banks in Nigeria were the major employers of labour in the financial sector. However, the economic recession of 2016, with its negative growth in four consecutive quarters, resulted in the retrenchment of several bank employees. The overall effect of the recession resulted in the loss of seven million nine hundred thousand jobs cumulatively (Nigeria Bureau of Statistics, 2018). The financial crisis of 2008 and the economic recession of 2016 with a spill-over effect to 2017 affirm the fact that banks are sensitive to macroeconomic conditions. Just as macroeconomic factors affect substantially the profitability of banking institutions, so also is the effect on the overall banking sector (a bi-directional relationship). Thus, understanding and monitoring the impact of a deteriorating or weak economy on the health of the banking industry is very important for bank regulators, policymakers and investors at large.

However, in contemporary literature, there have been astonishingly sparse studies concentrating on the effects of alternative measures of economic performance on bank profitability in Nigeria vis-à-vis the traditional measures. However, in contrast to Nigeria, proof of this aspect of literature is typically founded on developed market economies (Sheefeni, 2015; Moussa, 2012; Mamatzakis and Remoundos, 2003). Adekola (2016), Osamwonyi and Michael (2014) are among scholars who have conducted researches on the subject matter in Nigeria, though they employed only the traditional measures of economic performance (GDP growth rate, inflation rate and Interest Rate), without recourse to other modern alternative measures. However, the impact of some alternative economic indicators such as human development index and stock market performance (market capitalizations) on profitability are still unexplored as economists place so much emphasis on GDP which has met stiff criticism as a result of being a lagging indicator. According to Blanchard (2000) some economists are of the conclusion that stock prices or market capitalizations reflect the performance of the economy. He observed that the Dow Jones industrial index between the year 1990 to 1999 and the economy moved in alignment.

The study seeks to investigate the relationship between economic performance and the profitability of banks in Nigeria. The rest of the paper is organised as follows; Section II reviews both theoretical and empirical literature. Section III discusses the methodology. Section IV presents and discusses the findings, while section V concludes the study.

2. LITERATURE REVIEW

2.1. Theoretical Framework

Several theories/models attempt to explain the nexus between economic performance and bank profitability. Nevertheless, the theoretical underpinning for this paper follows the Financial Repression Hypothesis by McKinnon and Shaw (1973), Endogenous Growth Model by Arrow (1962) and Romer (1986).

Financial Repression Hypothesis is attributed to the works of McKinnon (1973) and Shaw (1973). They recognized the important role played by financial institutions in fostering economic growth through qualitative and quantitative service delivery. They hypothesized that the more efficient a country's financial system, the more likely for development to be attained through effective allocation of capital. They argued that uncompetitive financial system results in lower investment and savings. Many countries both developing and developed have restricted financial competition through government interventions and regulations.

McKinnon and Shaw see financial repression to be caused by some set of government laws, restrictions and regulations that prevent the operators in the financial sector from working at full capacity. They hypothesized that interest rate ceilings, capital controls, liquidity ratio, high cash reserve requirements credit restrictions, and government ownership of banks are some policies that cause financial repression and impairs growth.

McKinnon (1973) put forward a hypothesis based on the assumption that the greater the real interest rate, the higher the money balances accumulation and enticement to invest. The model, as presented by equation 1, shows that mathematically real demand for money is linked to the investment ratio of output and real output. The presentation is:

$$\left(\frac{M}{p}\right)d = f\left(\frac{1}{Y}, \frac{Y}{p}, d - p^*\right) \quad (1)$$

Where: $\left(\frac{M}{p}\right)d$ is the real demand for money; $\frac{1}{Y}$ is the ratio of investment to output; $\frac{Y}{p}$ is the real output; and $d - p^*$ is real interest rate on deposits.

This hypothesis by McKinnon leads to policy assumption that inflationary finance and deposit rates of interest result to fast-tracking development. Shaw (1973) hypothesis is similar to that of McKinnon, but it does not assume that money and physical capital complement each other. He believed that removing financial repression by raising the real interest rate would provide greater incentives for saving and investing, leading to more efficient resource allocation.

The Endogenous growth theory postulates that human capital investment, knowledge and innovation significantly contribute to growth. The endogenous theory of growth mainly holds that an economy's long - term growth rate depends on policy actions. The theory also poses that economic growth can result from externalities and a positive spill over effects. The role financial intermediation play in achieving economic growth is central to this theory. The earliest endogenous model, the AK models, simply anticipated constant returns to capital or the set of production factors that can be accumulated, such as capital.

Mishra (2016) noted that Endogenous growth theories assume that:

- i) There are a lot of companies in a market.
- ii) Knowledge or advancement in technology is a non - rival good.
- iii) There are increasing returns to scale to all factors taken together and constant returns to a single factor, at least for one.
- iv) Technological progress is based on new ideas.

The traditional Arrow's model can be simplified as follows

$$Y_t = A(K) F(K_p, L_t) \quad (2)$$

$$Y_t = F(K, L) \quad (3)$$

Where: Y_t is Output at time t ; K is Capital Stock; L is Labour; K_t = human and physical capital stock and L_t = unskilled labour.

2.2. Empirical Literature

A number of empirical studies including Alkhazaleh, (2017); Combey and Togbenou, (2016); Adekola, (2016); Joseph and Tabitha, (2016)); Etale et al., (2016); Duraj and Moci, (2015) have attempted to examine the link between bank profitability and economic performance.

Alkhazaleh (2017) studied the influence of banking sector performance on economic growth using data from 2010 to 2015. The study revealed that bank performance had a positive impact on economic growth (measured by GDP). The study recommends that policymakers should augment and stimulate the banking sector to ensure inclusive growth.

Combey and Togbenou (2016) investigated the impact of macroeconomic environment on banking sector performance in Togo, using data spanning the period of 2006-2015. The findings showed that real GDP and exchange rate affect ROE and ROA negatively and significantly, but inflation had no effect on profitability. The study recommends that policy makers should use proactive measures to stimulate the economy.

Adekola (2016) reviewed the effects of banks profitability on growth in Nigeria using data spanning the period of 2005 to 2014. Ordinary least square (OLS) technique was employed in the study. Findings showed that a significant negative relationship existed in Nigeria between bank profitability and gross domestic product. The study recommends that the CBN take more decisive steps to tighten the Nigerian banking sector's risk management framework so as to impact the sector positively and profitably.

John (2016) studied the effects of exchange rate fluctuations on commercial banks financial performance in South Sudan. Correlation analysis and OLS was adopted in the study to explain the ROA, inflation rates, spread of interest rates, bank size and exchange rates relationship. Employing semi-annual data covering 2006 to 2015, the study found that there was a weak negative association between exchange rate fluctuations and ROA. The study recommends that South Sudan central bank should take adequate action to safeguard the domestic currency's value.

Joseph and Tabitha (2016) examined the effect of capital on the financial performance of Kenya's commercial banks. Employing annual time series data spanning the period of 2010 to 2014, the result revealed that the core capital to the total risk and weighted assets for the Tier 1 banks shrank between 2010 and 2014. The study recommends that commercial banks be allowed to set their own capital adequacy ratio benchmarks beyond the central bank minimum capital requirement.

Etale *et al.* (2016) studied the impact of non-performing loans on bank performance in Nigeria. The study employed multiple regression techniques to analyse data covering the period 1994 -2014. The results revealed that a high level of non - performing loans would reduce banks long term performance. Also, a negative relationship was found to exist between non-performing loan and bank performance. The study recommended strengthening credit reporting agencies and supervisory authorities to reduce the high NPL level.

Shuremo (2016) Investigated bank profitability determinants in Ethiopia using data set from 2002 to 2012. Using the OLS technique, he found that economic growth, interest rates and exchange rates have a statistically significant and positive relationship with profitability of banks. The study recommends that bank managers, directors, and all stakeholders be concerned not only with internal structures and policies, but also with the external environment to enhance and sustain profit.

Duraj and Moci (2015) examine the factors affecting the profitability of the bank in Albania using data set covering the period 1999 – 2014. They found out using multiple regression technique that deposit/Loans ratio, GDP were significant and related positively to ROE but inflation was negatively related. The result also revealed that NPL was not significant and does not explain the changes in bank profitability.

Alemu (2015) examined commercial banks' profitability determinants in Ethiopia using annual data spanning 1987-2008. With the aid of panel regression, the study found out the size of the bank, capital adequacy and GDP have a positive profitability relationship. While liquidity risk, operational efficiency, cost financing, and development of the banking sector have a negative and significant profitability relationship. The study recommends government and policy makers should focus on reengineering banks in conjunction with key internal profitability drivers.

Mainstream studies on bank profitability and economic performance, adopted the traditional measures of economic performance. The weakness and lagging nature of traditional measures of economic performance calls for alternative measures. Thus, key alternative measures of economic performances which are considered more appropriate and plausible for a study on bank profitability and economic performance was adopted for the present study. This becomes more fitting as the empirical works revealed no conclusive evidence and did not consider major stylised fact outside regression analysis.

3. METHODOLOGY

This study adapted the Financial Repression Hypothesis to critically examine the relationship between economic performance and the profitability of banks in Nigeria.

Drawing from the financial repression theory (Equation 1), the structural modification of the model can be specified thus:

$$\text{Bank Profitability} = F(\text{interest rate, investment ratio, real output}) \quad \text{Equation 4}$$

To reflect the peculiarities of modern economic realities, the study further employed the modified models of Kanwal and Nadeem (2013) and Ameer (2015), with little structural modification to reflect the peculiarities of the Nigerian economy. To this end, the researchers employ the purposive sampling method in choosing the banks used in this study. Variables relevant to the study are adapted to increase efficiency obtainable when time-series and cross-section data are combined. Thus, ROA is stated as functions of selected macroeconomic variables used as proxies for bank profitability and economic performance respectively. Consequently, the implicit Panel Regression Model is specified as:

$$Y_{it} = \alpha D_{it} + \beta_{xt} X_{it} + \beta_{zt} Z_{it} + e_t \quad \text{Equation 5}$$

Where: Y is the bank profitability variable of interest and D are relevant dummies of the banks. X are relevant measures of macroeconomic performance, Z is a set of control variables and the subscripts i denote the cross sections (banks) and t denote the time, respectively.

The fixed effect regression model is specified as:

$$Y_t = \alpha_0 + \alpha_1 D_1 + \beta_1 GGR_t + \beta_2 IR_t + \beta_3 INF_t + \beta_4 EXR_t + \beta_5 MCAPG_t + \beta_6 FDIG_t + \beta_7 NPL_t + \beta_8 OPE_t + \beta_9 CAD_t + \beta_{10} GTD_t + e_t \quad \text{Equation 6}$$

Where: D_1 = Bank Dummy variables, while all the other variables are as defined in Table 1. Since the study is concerned with both the within effect and collective effect.

The pooled and fixed effect model is appropriate. FEM reduces selection bias in the estimation of causal effects. That is, it removes the pernicious effect of omitted variable bias (Wooldridge 2010). When using FEM, it is assumed that the predictor or outcome variables can be affected or bias and thus the need to control for this. This is the rationale for assuming the correlation between the error term of the entity and the variables of the predictor. FEM removes the effect of time-invariant characteristics so that the net effect of the predictors on the result variable can be assessed. More so, when the cross-sections are small relatively to the time, random effect becomes unfeasible and FEM preferable (Gujurati and Porter, 2009). Since Pooled model does not make difference between periods and cross section, the changes in cross sections are observed using dummy variables. The Redundant fixed effect is used to decide whether to accept the fixed effect result or pooled.

3.1. Variables in the Models

The definitions and notations of the variables in the model are presented in Table 1.

Twenty-one (21) commercial banks are operating in Nigeria. The target population therefore are the twenty-one (21) banks (that is, ten commercial banks with international authorization in Nigeria, nine commercial banks with national authorization: and two commercial banks with regional authorization). Thus, a sample of eight banks; comprising commercial banks with international and national authorization are selected for this research by means of purposive sampling technique. However, none of the commercial banks with regional authorisation were used because they are relatively new and have no relevant data considering the scope of the study. The deliberate choice of these banks is due to the specific qualities they possess as opined by Tongco (2007 cited in Addael *et al.* 2014).

Table 1: Definitions and notation of the variables of Bank profitability and Economic Performance

	<i>Variable</i>	<i>Measure</i>	<i>Notation</i>	<i>Hypothesized relationship with profitability</i>
Dependent variable	Profitability	Net profits/ Total Assets	ROA	N/A
Independent	Inflation	Consumer price index	INF	+/-
“	Economic Growth	GDP Growth Rate %	GGR	+
	Interest Rate	MPR Proxy for interest rate	IR	+
“	Exchange Rate	Average Exchange Rate	EXR	+/-
Alternative Measure	Stock Market Performance.	Stock market capitalization Growth rate	MCAPG	+
Control Variables	Foreign Direct investment net inflow	Foreign Direct investment net inflow (Growth rate)	FDIG	
	Operational efficiency	Operational efficiency (Ratio of operating expenses to operating income)	OPE	+
	Credit risk	Non-Performing loan	NPL	-
	Capital Adequacy	Equity/Total Assets	CAD	+
	Growth in total Deposit		GTD	+

Source: Computed by the researchers using 2005-2017 Annual Reports of Banks

The panel dataset for the eight banks namely, First Bank, Zenith Bank, UBA, GTB, Fidelity, Ecobank, Diamond Bank, and Access Bank covers the period 2005 - 2017. The data set on banks profitability was sourced from the annual statement of accounts of each bank, while the data on economic performance was sourced from CBN Statistical Bulletin (2017), NBS (2018). The eight banks selected have survived the financial distress and consolidation crises and have the available financial report to gauge their performance over the period under study.

4. DATA, RESULTS AND DISCUSSION

4.1. Some stylized facts on bank performance in Nigeria

Figure 1 to Figure 3 is used to explain the average return on asset (ROA), the average capital adequacy ratio and the average growth of deposit ratio of each of the selected bank over the study period.

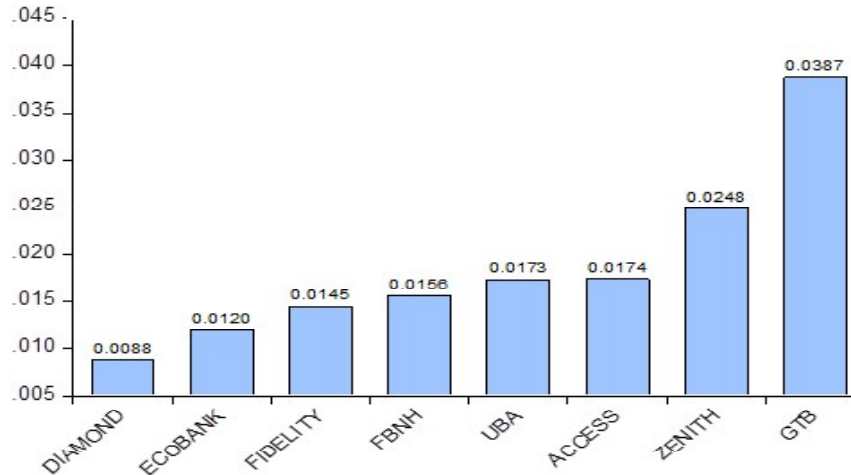


Figure 1: Mean ROA of Banks in Nigeria

Source: Computed by the researchers using 2005-2017 Annual Reports of Banks

Figure 1 depicts the average return on asset of each bank selected for the study. The Figure shows that diamond bank's average return on asset was the lowest while UBA, ACCESS, ZENITH and GTB had the highest return on asset respectively within the study period. Interestingly, diamond bank's weak financial position led to the technical merger with access bank.

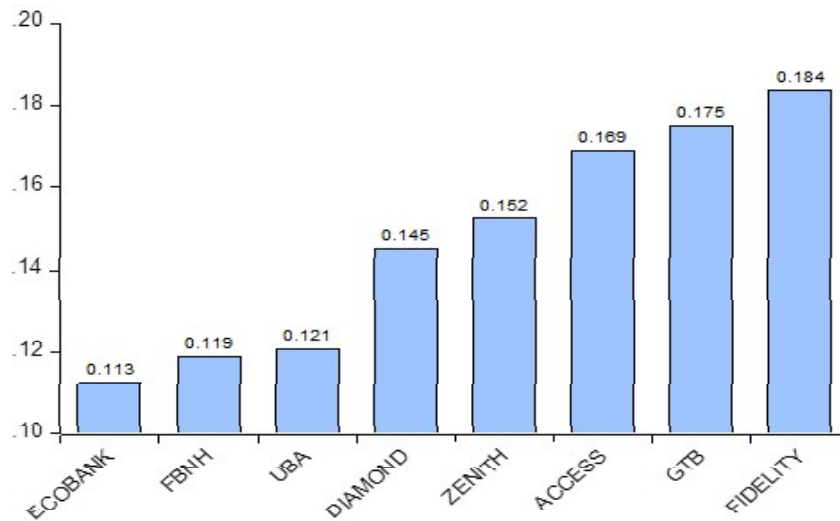


Figure 2: Mean CAD of Banks in Nigeria

Source: Computed by the researchers using 2005-2017 Annual Reports of Banks

Figure 2 depicts Capital adequacy (CAD). The Figure shows that Ecobank had the least average CAD followed by FBNH on the average while, GTB, Fidelity had the highest average capital adequacy within the study period respectively. Since capital is held in order to absorb potential losses and meet depositor's demand. It shows that Access bank, GTB and Fidelity can withstand potential losses. Hence it is not surprising that Access bank could absorb Diamond bank in what was referred to as technical merger.

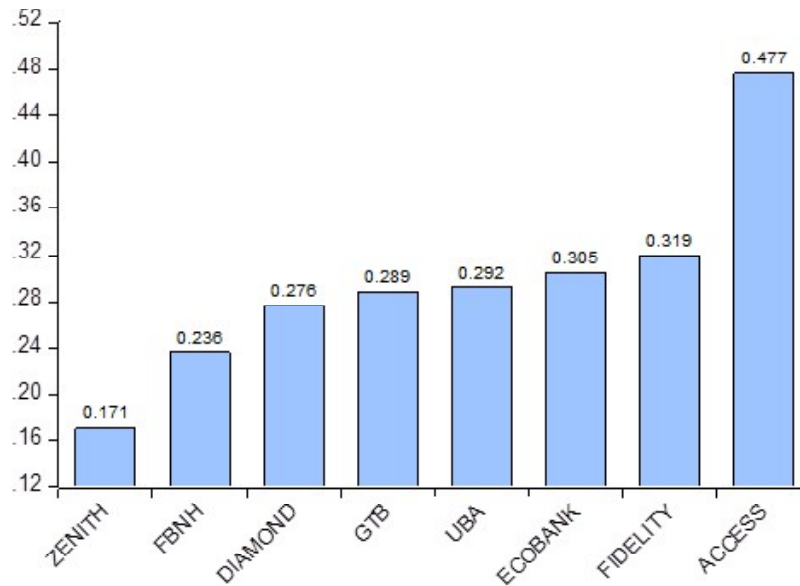


Figure 3: Mean GTD of Banks in Nigeria

Source: Computed by the researchers using 2005-2017 Annual Reports of Banks

Figure 3 depicts growth in total deposit (GTD): The Figure shows that Zenith, FBNH and Diamond bank had the least average GTD while UBA, Ecobank, Fidelity and Access banks had the highest average growth of deposits. This is not surprising as the low GTD of Zenith, FBNH, and Diamond can be attributed to the implementation of TSA which took majority of government deposits away from these banks.

4.2. Test for Stationarity

Formal testing for stationarity is done on the residual using the Levin, Lin and Chu, Im, Pesaran and Shin W-stat, and ADF - Fisher Chi-square unit root test for panel data as shown in Table 2. The test is shown to be stationary as the p-values are lesser than 0.05.

Table 2: Unit root test results in levels and difference

	<i>Levin Lin and Chu at level (Prob- value)</i>	<i>Levin Lin and Chu at diff.</i>	<i>Im, Pesaran and Shin W-stat at level</i>	<i>Im, Pesaran and Shin W-stat at diff. (Prob- value)</i>	<i>ADF-Fisher Chi-square at level</i>	<i>ADF-Fisher Chi-square at diff. (Prob- value)</i>	<i>Order of co-integration</i>
ROA	-6.19536 (0.0000)		-3.05990 (0.0011)		-2.98771 (34.9661)		I(0)
ROE	-7.19381 (0.0000)	-	-2.98771 (0.0014)	-	35.2895 (0.0036)	-	I(0)
GGR	-7.86280 (0.0000)	-	-3.41731 (0.0003)	-	36.8890 (0.0022)	-	I(0)
IR	-6.01823 (0.0000)	-6.41845 (0.0000)	-1.40540 (0.0800)	-2.04678 (0.0203)	21.3854 (0.1642)	28.3226 (0.0289)	I(1)
INF	2.71911 (0.9967)	-4.86031 (0.0000)	-0.81996 (0.2061)	-3.67701 (0.0001)	18.3018 (0.3065)	38.8457 (0.0011)	I(1)
EXR	8.27158 (1.0000)	-8.49493 (0.0000)	8.43523 (1.0000)	-3.76586 (0.000)	0.01736 (1.0000)	39.2347 (0.000)	I(2)
MCAPG	-12.6668 (0.0000)	-	-6.70717 (0.0000)	-	61.4611 (0.0000)	-	I(0)
FDIG	-9.79699 (0.0000)	-	-5.40223 (0.0000)	-	53.8590 (0.0000)	-	I(0)
NPL	-4.66419 (0.0000)	-4.82767 (0.0000)	-1.46251 (0.0718)	-2.51867 (0.0059)	25.3459 (0.0640)	53.5242 (0.0117)	I(1)
OPE	-9.08786 (0.0000)	-	-4.13841 (0.0000)	-	52.1881 (0.0000)	-	I(0)
CAD	-4.16977 (0.0000)	-9.53382 (0.0000)	-7.80494 (0.1002)	-5.45917 (0.0000)	26.3138 (0.1308)	54.8217 (0.0000)	I(1)
GTD	-9.63511 (0.0000)	-	-7.80494 (0.0000)	-	72.7561 (0.0000)	-	I(0)

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

After testing for stationarity, the variables were found to be stationary at level but CAD, NPL, IR and INF were stationary at first difference while EXR was stationary at 2nd difference in every test except Levin Lin and Chu at 5% level of significance as shown in Table 2, thus the results from the estimation of the model are likely to be unbiased and consistent.

4.3. Granger Causality

The Pairwise Panel Causality Tests was carried out to ascertain causal relationship between macroeconomic variables and bank profitability in Nigeria. The result in model

one (Table 3), shows evidence of causality between FDIG and ROA, as well as ROA and INF. The results imply that a change in foreign direct investment granger causes changes in ROA and not the other way round, thus implying a unidirectional causality. Also, changes in ROA granger causes changes in inflation rate and not the other way round. This clearly shows the potential of FDIG, as a key determinant of profitability.

Table 3: Pairwise Dumitrescu Hurlin panel causality tests (ROA Model)

<i>Null Hypothesis:</i>	<i>Obs</i>	<i>F-Statistic</i>	<i>Prob.</i>
EXR does not Granger Cause ROA	88	0.53952	0.5851
ROA does not Granger Cause EXR		0.29529	0.7451
FDIG does not Granger Cause ROA	88	5.81400	0.0043
ROA does not Granger Cause FDIG		1.19094	0.3091
GGR does not Granger Cause ROA	88	2.36202	0.1005
ROA does not Granger Cause GGR		0.16223	0.8505
INF does not Granger Cause ROA	88	1.56191	0.2158
ROA does not Granger Cause INF		5.06095	0.0084
IR does not Granger Cause ROA	88	6.49598	0.2158
ROA does not Granger Cause IR		0.32481	0.7236
MCAPG does not Granger Cause ROA	88	1.25097	0.2916
ROA does not Granger Cause MCAPG		0.16675	0.8467
OPE does not Granger Cause ROA	88	0.14709	0.8634
ROA does not Granger Cause OPE		0.55172	0.5781

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

In order to select the appropriate model which provides consistent estimates for this study, the Redundant Fixed Effects test was employed as suggested by Brooks (2008). Table 4, presents the Redundant Fixed Effects test which suggests the fixed effects model was better than pooled effect model as the p-value (0.000), is lesser than 0.05 significant level, which imply that the pooled effect model should be rejected and thus, the analysis is based on the fixed effects estimates.

Table 4: Redundant fixed effects tests (ROA Model)

<i>Redundant Fixed Effects Tests</i>			
<i>Effects Test</i>	<i>Statistic</i>	<i>d.f.</i>	<i>Prob.</i>
Cross-section F	10.220584	(7,86)	0.0000

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

4.4. Fixed-Effect Panel Model Results

The result of the fixed effect panel model is presented in Table 5. A close examination of the regression results in Table 5 shows that the explanatory variables explained about 60.2% of the systematic variation in bank profitability.

The F-statistic, which is a measure of the overall significance of the model, is 7.66 with the corresponding probability value of 0.000, is statistically significant at 5%. The implication of this is that the explanatory variables have a joint significant effect on economic growth. The Durbin-Watson statistic of 1.82, which is approximately two (2), using the rule of thumb, indicates that the result is not spurious and free from serial correlation as further confirmed by the panel serial correlation test. Of all the dummy variables used to capture banks, only the dummies of Zenith and GTB were significant. After critical analysis of the relationship between economic performance and banking sector profitability in Nigeria, it was discovered that Average Exchange Rate (EXR) is negatively related to return on asset at 10% level of significance. The coefficient of Average Exchange Rate (EXR) is $-7.03E-05$ (P-value=0.0586). A devaluation or a decrease in the value of the exchange rate leads to a decrease in ROA by $-7.03E-05$ units. The coefficient of interest rate (IR) was significant and positively related to return on asset at the 5% level of significance. The coefficient of interest rate (IR) is 0.002066 (P-value = 0.0018). An increase in interest rate increases the profitability (ROA) of banks by an average of 0.002066 units.

Findings from the study reveal a significant and positive relationship between Capital Adequacy ratio (CAD) and Return on Asset (ROA) at 5% level of significance. The coefficient of Capital Adequacy ratio (CAD) is 0.099598 (P-value = 0.0029). An increase in Capital Adequacy ratio increases the profitability (ROA) of banks by an average of 0.099598 units. Also, the coefficient of operational efficiency used as a proxy for human development (OPE) was significant and negatively related to return on asset at the 5% level of significance. The coefficient of OPE is -0.013308 (P-value = 0.0004). A decrease in operational efficiency decreases the profitability (ROA) of banks by an average of -0.013308 units. The coefficient of GDP growth rate, inflation rate, stock market performance growth rate non-performing loan, foreign direct Investment growth rate and growth in total deposit were all insignificant in the model.

Table 5: Results of the fixed-effects panel model (ROA Model)

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	-0.002899	0.016115	-0.179899	0.8577
CAD	0.099598	0.032503	3.064275	0.0029
EXR	-7.03E-05	3.67E-05	-1.916420	0.0586

contd. table 5

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
FDIG	0.005612	0.003445	1.629258	0.1069
GGR	-4.85E-05	0.000799	-0.060710	0.9517
GTD	-0.002587	0.002291	-1.129629	0.2618
INF	9.35E-05	0.000414	0.225893	0.8218
IR	0.002066	0.000640	3.226744	0.0018
MCAPG	0.000443	0.002011	0.220421	0.8261
NPL	-0.000137	0.000205	-0.671811	0.5035
OPE	-0.013308	0.003595	-3.701584	0.0004
ZENITH	0.015030	0.004868	3.087660	0.0027
GTB	0.020198	0.003722	5.427329	0.0000
UBA	0.006036	0.003980	1.516545	0.1330
FIDELITY	0.001771	0.004176	0.424054	0.6726
DIAMOND	-0.004239	0.003800	-1.115479	0.2678
FBNH	0.001393	0.004084	0.341183	0.7338
ECOBANK	0.003333	0.004110	0.810967	0.4196
R-squared	0.602357			
Adjusted R-squared	0.523753			
S.E. of regression	0.009400			
Sum squared resid	0.007599			
Durbin-Watson stat	1.822098			
F-statistic	7.663192			
Prob (F-statistic)	0.000000			

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

4.5. Post Estimation Test

4.5.1. Model Specification Test

The diagnostic test which includes Wald test, serial Correlation test, Heteroskedasticity test and normality test are presented in Table 6

Table 6: Wald Test: (ROA Model)

<i>Test Statistic</i>	<i>Value</i>	<i>Df</i>	<i>Probability</i>
F-statistic	4.053790	(6, 86)	0.0013
Chi-square	24.32274	6	0.0005

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

The Wald χ^2 was employed to tests whether the regressors explained the variation in the dependent variable. The null hypothesis is that the coefficients of the regressors are jointly zero. The null hypothesis is accepted, meaning that the model is well specified and has a fine goodness of fit.

4.5.2. Normality Test

The normality test result is presented in Table 7

Table 7: Residual cross-section dependence test

<i>Test</i>	<i>Statistic</i>	<i>d.f.</i>	<i>Prob.</i>
Breusch-Pagan LM	42.46260	28	0.0392
Pesaran scaled LM	1.932647		0.0533
Bias-corrected scaled LM	1.599314		0.1098
Pesaran CD	4.138472		0.0000
Normality Test			
Jarque-Bera	5.0584	Probability	0.0797

Source: Computed by the researchers using Eviews 10 Software from data obtained from CBN Statistical Bulletin (2017) and Annual Reports of Banks (2005-2017).

The result reveals that the residual is normally distributed, as the Bera-Jarque statistic has a P-value of 0.0797, which is greater than 0.05.

5. SUMMARY AND CONCLUSION

This study has examined the nexus between economic performance and bank profitability and has brought to the fore the need to examine the impact of alternative measures on bank performance, outside the traditional measures. Thus, using annual panel data spanning the period of 2005 – 2017 and with the aid of pooled OLS, fixed effect panel regression technique regression and the panel Granger Causality Test with further diagnostic test to ascertain the reliability and validity of the result, the study reveals that there exist low correlation between macroeconomic variables and bank profitability and that bank specific variables had higher correlation with bank profitability as compared to macroeconomic variables. It could be also concluded that a uni-causal relationship exists between Foreign Direct Investment Growth Rate (FDIG) and Return on Assets (ROA), ROA and Inflation Rate (INF).

Also, it was found that capital adequacy ratio (CAD), Interest Rate (IR) had significant impact and contributes positively to return on asset, whereas Operational Efficiency (OPE) and Average Exchange Rate (EXR) were found to be negatively

related to return on asset. Also, it can be concluded based on the size of the coefficient that EXR exert more impact than the alternative measures and other traditional measures of economic performance on bank profitability in Nigeria.

Based on the findings of this study, the following recommendations are made:

- i) The coefficient of interest rate (IR) was significant and positively related to return on asset. Policymakers (monetary authorities and monetary policy committee) should formulate policies that promote optimal interest rate that is appealing to both lenders and borrowers.
- ii) The coefficient of operational efficiency was significant and negatively related to return on asset. OPE shows how efficient and effective staffs are in mobilizing funds and ensuring positive profit before tax (PBT). The negative sign may be attributed to the employment of graduates with little or no financial education background. Hence, banks should ensure that a large number of staffs employed to man key sensitive and non-sensitive positions are trained economists, accounting and finance graduates.
- iii) The coefficient of average exchange rate (EXR) was negatively related to return on asset. The central bank should take adequate action to safeguard the domestic currency's value and curtail the excesses of the informal exchange rate window by unifying exchange rates across the three recognized market segments namely, the official, interbank and Bureau de change (BDC).
- iv) Though insignificant, the coefficient of non-performing loan was negatively related to return on asset. The government should strengthen credit reporting agencies and supervisory authorities in order to reduce the negative impact of non-performing loan. Also, banks should improve their capacity in credit analysis and loan administration, while regulators should pay more attention to compliance by banks.

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