

Determinants of Commercial Banks' Profitability in Nigeria: A Panel Data Approach

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Abstract

This study investigated the determinants of commercial banks' profitability in Nigeria using annual panel data from 2010 to 2022. The annual data for the study were collected from the selected commercial banks' websites and the World Development Indicators (WDI). The study used the growth rate of commercial banks' net profit after tax as the dependent variable and inflation rate, dividend pay-out growth rate, total assets growth rate, exchange rate, and lending rate as the independent variables. The study estimated the specified model using the panel-pooled OLS, fixed effect, and random effect models. The random effect model was more appropriate based on the Hausman test result. The empirical findings revealed that the dividend pay-out growth rate positively and significantly impacted commercial banks' profitability. Also, the total assets growth rate had a positive and significant impact on commercial banks' profitability. Based on the findings, the study recommends that commercial banks should continue to pay dividends to shareholders and invest in more assets to enhance commercial banks' profitability in Nigeria.

Keywords: Commercial Bank, Profitability, Panel Data, Nigeria Jel Classification Codes: C2; G2; G3; E5

Introduction

Commercial banks are very important in the process of financial transactions among economic agents in every country. Commercial banks are financial institutions that conduct financial transactions such as investments, loans and deposits. Almost everyone in a country deal with commercial banks regularly. Commercial banks undertake financial transactions from depositing money to taking out loans and exchanging currencies (Howells & Bain, 2007). The profitability of commercial banks is very vital and relevant to their survival and the functioning of the whole economic system. Commercial banks have to be prudent in carrying out banking activities to post higher profits and low risk.

The Nigerian banking system has experienced various reforms including the era of the universal banking system that legally empowered commercial banks to dive into various activities in the financial markets. Most of the transactions and activities in the money and capital markets are carried out by commercial banks, and the banking sector is one of the most important sources of financing economic growth in Nigeria. The management of commercial banks is concerned with identifying the determinants of banks' profitability by adjusting their policy over time to ensure successful operations. According to Gemechu (2016), the investigation of the factors that determine commercial banks' profitability has attracted decision-makers and researchers following the importance of the banking industry in growth and development.

Over the years, Nigerian commercial banks have continued to post profits (Ali & Puah, 2019; Mustapha & Abdullahi, 2023). Many scholars have made some efforts to find out the factors

determining commercial banks' profitability (Khan, 2022; Mamo, 2022; Akther, Rahman & Rahman, 2023; Yuan, Gazi, Harymawan, Dhar & Hossain, 2022; Ebenezer, Omar & Kamil, 2017; Tiep, Thanh, Ha & Nga, 2022; Jigeer & Koroleva, 2023; Le & Ngo, 2020; Chinida, 2014; Rumaly, 2023; Kunwar & Jnawalu, 2023; Chand, Kumar, Stauvermann & Shahbaz, 2024; Farkasdi, Septiawan, & Alghifari, 2021; Smolina, Markovskaya & Krupnov, 2022). The results of the empirical studies are mixed, and this warrants further research into the determinants of commercial profitability in Nigeria.

The purpose of this study is to provide further empirical evidence for policy formulation and implementation on what determines commercial banks' profitability in Nigeria using the pooled ordinary least squares (OLS), fixed effect, and random effect models. This is one of the few empirical studies to investigate the determinants of commercial bank profitability in Nigeria employing the pooled OLS, fixed and random effect models.

The study is structured as follows: the first section provides the background to the study, the second section summarises the related literature, the third section introduces the data and methods, the fourth section presents and explains the empirical results of data analysis, and the last section, provides the summary, conclusion and policy recommendations.

Literature Review

Several studies have been carried out on the determinants of commercial banks' profitability using time series and panel data in country-specific and cross-country studies (Khan, 2022; Mamo, 2022; Akther, Rahman & Rahman, 2023; Yuan, Gazi, Harymawan, Dhar & Hossain, 2022; Ebenezer, Omar & Kamil, 2017; Tiep, Thanh, Ha & Nga, 2022; Jigeer & Koroleva, 2023). Several studies found that various factors relating to industry-specific, macroeconomic environment and others influence commercial banks' profitability (Le & Ngo, 2020; Chinida, 2014; Rumaly, 2023; Kunwar & Jnawalu, 2023; Chand, Kumar, Stauvermann & Shahbaz, 2024; Farkasdi, Septiawan, & Alghifari, 2021; Smolina, Markovskaya & Krupnov, 2022). In this subsection, we review some relevant previous empirical studies focusing on the determinants of commercial banks' profitability.

Mustapha and Abdullahi (2023) examined the effect of dividend policy on financial performance of listed deposit money banks in Nigeria. The data were collected from seven listed money deposit banks for a period of seven years from 2015 to 2021. The result indicates that dividend per share significantly and positively influenced the financial performance of listed deposit money banks in Nigeria. It also showed that firm size is negative and significantly related with firm financial performances. The result implied that larger firms were so reluctant about improving performance. On the other hand, the result of leverage revealed a positive significant relationship with financial performance. Thus, the finding was important to shareholders and potential investors.

Khan (2022) examined the factors that determine banks' profitability in the Gulf Cooperation Council (GCC) countries. The pooled ordinary least squares (OLS), fixed effect and random effect models were employed in analysing annual data obtained on 59 banks operating in the six GCC countries. Bank size and GDP growth rate had a significant and positive association with return on asset (ROA). While Bank size and asset management had a significant and positive impact, capital adequacy, financial risk, operating efficiency, and asset quality had a negative and significant impact on return on equity (ROE).

Akther, Rahman and Rahman (2023) investigated the determinants of commercial banks' profitability in Bangladesh using pooled, fixed and random effect models to analysed annual data on twenty (24) commercial banks from 2014 to 2020. The study found that commercial banks' branches, asset management, and assets quality had statistical impact on commercial banks' profitability. It was also found that inflation and exchange rate had significant impact on commercial bank profitability in Bangladesh. The study recommended that commercial banks in Bangladesh should focus on both bank and macroeconomic variables to boost their profitability.

Rumaly (2023) investigated the factors influencing return on equity (ROE) within the banking sector of Bangladesh by analyzing a dataset spanning from the year 2011 to 2020 using a combination of econometric techniques, including the one-step difference Generalized Method of Moments (GMM), Driscoll-Kraay estimator, and panel-corrected standard errors (PCSE) methods. The findings revealed that earnings per share (EPS), capital adequacy ratio (CAR), and bank spread showed a significant positive influence on ROE, reflecting the importance of profitability, capital strength, and interest rate spreads. Conversely, asset size, operating cost-to-loans ratio, total equity-to-debt ratio, and inflation exert a significant negative impact on ROE, highlighting the challenges associated with growth, cost efficiency, leverage, and inflationary pressures. The findings provided a multifaceted perspective on the dynamics of ROE, offering valuable insights for banks and policymakers striving to optimize financial performance and stability in the ever-changing economic landscape in Bangladesh.

Yuan, Gazi, Harymawan, Dhar and Hossain (2022) investigated the impact of the determinants of profitability of commercial banks in Asian countries. Data on 40 private banks in India and Bangladesh covering from 2010 to 2021 were analyzed using panel ordinary least squares (OLS) estimation techniques. The major findings showed that the Return on Asset (ROA) from the banks' specific variables, strength of the Bank size (BS), and Debt to Asset Ratio (DAR) were positive and significant. For banks, the Deposit to Asset Ratio (DTAR) and the Loan to Deposit Ratio (LDR) were found to be negative and significant. The Equity to Asset Ratio (EAR) and Debt to Equity Ratio (DER) had no positive/negative impact on banks' profitability. Their recommended that authorities responsible for regulating the financial performance of the banking sector should make decisions based on the findings.

Tiep, Thanh, Ha and Nga (2022) investigated the impact of internal and external factors on the profitability of joint-stock commercial banks during 2009-2020. The data sample of 24 joint-stock commercial banks accounting for a large proportion of the total assets of the Vietnamese commercial banking system were analysed using the fixed effect and random effect models. The findings revealed that ROA had a positive relationship with size of equity, liquidity, income diversification. Inflation was negatively related to operating costs. Based on the results, the study proposed the strengthening of banks cooperate policies to boost their profitability.

Mamo (2020) investigated the determinants of commercial banks' profitability in Ethiopia employing the fixed effect model to analysed annual data on seventeen (17) commercial banks from 2005 to 2019. The study found that banks' liquidity and interest rate have negative and significant impact on commercial banks profitability. The study recommended that commercial banks in Ethiopia should focus on bank specific and industry specific variables to increase their profitability.

The Gap in Literature and Intended Contribution to Knowledge

The study observed from the reviewed literature that empirical studies that focused on the determinants of commercial banks' profitability in Nigeria were few and they used return on asset (ROA) or return on equity (ROE) as a proxy for commercial banks profitability. The current study differently used net profit after tax of commercial banks as the proxy for commercial banks' profitability. This study decided to use net profit after tax as a proxy for commercial banks' profitability in furtherance of evidence in the study area.

Methodology

Model Specification and Estimation Technique

Based on the specifications of a few empirical studies (Memo, 2020; Akther, Rahman & Rahman, 2023) and in line with the objective of the study, the model to investigate the determinants of commercial banks' profitability in Nigeria is specified in its functional form as:

$$BPROFGT = f(INFL, ASBGR, DIVPGR, EXCR, LIR)$$

The model is specified in econometric form as follows:

$$BPROFGR_{it} = \beta_0 + \beta_1 INFL_{it} + \beta_2 ASBGR_{it} + \beta_3 DIVPGR_{it} + \beta_4 EXCR_{it} + \beta_5 LIR_{it} + \varepsilon_{it} \text{ -----} \\ \text{-----}(1)$$

Where: BPROFGR= commercial banks' profitability growth rate, INFL = inflation rate; measured by a consumer price index, DIVPGR = dividend paid-out growth rate, ASBGR = commercial bank total asset growth rate, EXCR = exchange rate, and LIR = lending interest rate, β = parameters, i = represents the individual commercial banks, t = denotes time and ε represents the stochastic term. The a priori expectations of all the coefficients' estimate in the model are greater than zero ($>$); $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$.

Estimation Technique

The estimation of the model as stated in equation (1) was achieved using the Pooled ordinary least squares (OLS), fixed effect and random effect models (Greene, 2008). These methods are used in estimating long panel data where we have time series observations, $t= 1, 2,..T$ on several groups, $i= 1, 2,.....N$. The number of time series observations (T) is relatively large and we can estimate individual equations for each country. This is to say, the number of time series observations (T) is greater than the number of cross-sections (N); $T > N$. In a situation of long panel ($T>N$), GMM methods of estimation may not be appropriate (Wooldridge, 2001). The panel data set can be in stationary form; integrated in order zero [I(0)], following unit root process [I(1)] or mixed. The order of integration of the panel data set is not a major problem in the application of ordinary least squares, fixed effect and Random Effect models (Kennedy, 2008).

Preceding the estimation of the specified regression model, the panel data set was described to ascertain the characteristics of the data- to determine the stationarity and co-integration status of the variable. The variables were tested for unit root using Levin, Lin and Chu, LLC (2002); homogeneous unit root procedure and the Im, Pesaran and Shin, IPS (2003); heterogeneous unit root testing procedure. The application of cointegration and unit root tests to our panel data set was to ascertain the properties of the data.

Data and Sources

The data for the study (which are annual time series data) were obtained from the individual websites of the selected banks- Access Bank Plc, Fidelity Bank Plc, First Bank Plc, GTBank Plc, Sterling Bank Plc, United Bank for Africa and Zenith Bank Plc. and the World Bank Development Indicator (WBDI) database. Specifically, the data set collected for this study covered 2010 to 2022. This period was determined by data availability.

Results of Preliminary Data Analysis

The results of preliminary data analysis are presented and discussed in this sub-section.

Descriptive Statistics

The descriptive statistics of the variables for the study are presented in Table 4.1. These include the mean (average) values of the variables, the median, maximum and minimum values of the variables, the Jarque-Bera statistic, and others.

Table 1. Descriptive Statistics of Variables

	BPROFGR	INFLR	DIVPDGR	ASBGR	EXR	LIR
Mean	0.472391	12.77828	0.632969	0.125317	264.8247	15.59110
Median	0.160654	12.15967	0.112231	0.142116	279.6411	16.63542
Maximum	13.87267	18.84719	12.96718	0.943249	425.9792	17.55333
Minimum	-0.999497	8.047411	-0.999941	-0.998961	153.8625	11.48313
Std. Dev.	1.884834	3.415051	1.988714	0.291360	96.57736	1.924914
Skewness	5.753424	0.264886	4.204076	-2.109292	0.220083	-1.109245
Kurtosis	38.18907	1.871775	22.92070	10.88112	1.647958	2.730666
Jarque-Bera Probability	4797.373	5.437432	1636.360	279.6799	7.076174	17.47985
	0.000000	0.065959	0.000000	0.000000	0.029069	0.000160
Sum	39.68088	1073.376	53.16943	10.52664	22245.27	1309.652
Sum Sq. Dev.	294.8659	967.9934	328.2637	7.045912	774156.5	307.5393
Observations	84	84	84	84	84	84

Source: Authors' Computation

The growth rate of commercial banks' profit was between 13.87267% and -0.999497% with a standard deviation of 1.884834 and an average growth rate of 0.472391% between 2010 and 2022. The median growth rate within the period was 0.160654 %. The inflation rate was between 18.84719 % and 8.047411% with a standard deviation of 1.884834 and an average inflation rate of 12.77828 % between 2010 and 2022. The median inflation rate within the period was 12.15967%. This showed that the inflation rates in Nigeria were double digits during the period of the study.

The dividend paid-out growth rate was between 12.96718% and -0.999941% with a standard deviation of 1.988714 and the average growth rate was 0.632969 % between 2010 and 2022. The median growth rate within the period was 0.112231. The exchange rate was between 425.9792 and

153.8625 with a standard deviation of 96.57736 and the average growth rate was 264.8247 between 2010 and 2022. The median exchange rate within the period was 279.6411.

Commercial banks' asset base growth rate was between 0.943249 % and -0.998961% with a standard deviation of 0.291360% and an average growth rate of 264.8247 % between 2010 and 2022. The median asset growth rate within the period was 0.142116%. The interest rate was between 17.55333% and 11.48313 % with a standard deviation of 1.924914 and the average rate was 15.59110% between 2010 and 2022. The median interest rate within the period was 16.63542 %.

Correlation Coefficients

The Pearson’s pairwise correlation coefficients between pairs variables of the study are presented in Table 2. The coefficients indicate the extent or degree of correlation between pairs of the variables.

Table 2. Matrix of Correlation Coefficients

VARIABLES	BPROFGR	INFLR	DIVPDGR	ASBGR	EXCR	LIR
BPROFGR	1.00					
INFLR	0.067285	1.00				
DIVPDGR	0.301714	0.047561	1.00			
ASBGR	0.246854	-0.239400	0.113144	1.00		
EXCR	0.089312	0.801987	-0.104339	-0.202684	1.00	
LIR	-0.066952	-0.551782	-0.033302	0.060168	-0.747568	1.00

Source: Authors’ Computation

Focusing on the dependent variable of interest, which is the growth rate of commercial banks' profit (BPROFGR), it can be observed that the inflation rate is positively correlated with the growth rate of commercial banks' profit. However, the coefficients are quite low, signifying a weak correlation and direct relationship. Other explanatory variables are observed to be positively corrected with commercial banks' profit growth rate except interest rate. An examination of the various correlation coefficients reveals that the coefficients are all less than 0.50. This is a pointer to the possibility that regression models estimated with the variables may not suffer the problem of multicollinearity which is usually associated with highly correlated variables.

Unit Root Tests

Before estimating the specified models, the variables were tested for unit root to ascertain their stationary or otherwise. In doing this, two-unit root testing processes – the homogenous (Levin, Lin and Chu, LLC) and the heterogenous (the Im, Pesaran and Shin, IPS) unit root testing processes were used. The results of the panel unit root test are presented in Table 3.

Table 3. Panel Unit Root Tests

Homogenous Unit Root Process							
Variables	Level			1 st Difference			Integration Order
	LLC Statistics	Prob.	Inference	LLC Statistics	Prob.	Inference	
BPROFGR	-12.3790	0.0000	S	-	-	S	0
INFLR	-0.18627	0.4261	NS	-5.50553	0.0000	S	1
DIVPDGR	-1.90650	0.0283	S	-	-	S	0
ASBGR	1.53799	0.9380	NS	-6.12655	0.0000	S	1
EXCR	-8.99836	0.0000	S	-	-	S	0
LIR	3.66248	0.9999	NS	-4.40103	0.0000	S	1

Heterogeneous Unit Root Process							
Variables	Level			1 st Difference			Integration Order
	IPS Statistics	Prob.	Inference	IPS Statistics	Prob.	Inference	
BPROFGR	-6.53782	0.0000	S	-	-	S	0
INFLR	-0.46642	0.3205	NS	-2.29238	0.0109	S	1
DIVPDGR	-3.63619	0.0001	S	-	-	S	0
ASBGR	-0.16693	0.4337	NS	-2.21168	0.0135	S	1
EXCR	-4.37822	0.0000	S	-	-	S	0
LIR	2.00773	0.9777	NS	6.2499	0.0000	S	1

Source: Authors' Computation

Both tests show that the variables considered for the study were integrated in different order. Inflation rate, commercial bank asset growth rate and lending interest rate were integrated order one while commercial banks profit growth rate, exchange rate and dividend paid out growth rate were integrated order zero. It could be inferred therefore from the panel unit root tests that the variables are of mixed order of integration.

Panel Cointegration Tests

The study conducted Pedroni Residual and Kao cointegration tests to determine the existence of a long-run relationship among the variables. The results of the cointegration tests are presented in Tables 4 and 5. Both tests proved the existence of a long-run relationship among the variables. The Pedroni Residual cointegration test had six (6) significant statistics out of eleven (11), which proved the existence of a long-run relationship among the variables. The hypothesis of no long-run relationship among the variables was rejected. The ADF t-statistic of the Kao cointegration test substantiated the test result of the Pedroni Residual cointegration test (Tefere & Teera, 2018).

Table 4. Pedroni Residual Cointegration Test

Series: ATCRSC, BLR, COC, EXR, LIR, LIR, PASAV, REQ				
Alternative Hypothesis: Common AR Coefficients(Within-dimension)				
	Statistic	Prob.	Statistic	Prob.
Panel v-statistic	-2.11989	0.9830	-2.311353	0.9896
Panel rho-statistic	1.910813	0.9720	2.140260	0.9838
Panel PP-statistic	-3.74722	0.0001	-4.05829	0.0000
Panel ADF-statistic	-2.44085	0.0073	-2.58896	0.0048
Alternative Hypothesis: individual AR Coefficients (between dimensions)				
	Statistic	Prob.		
Group rho-statistic	2.991838	0.9986		
Group PP-statistic	-9.565996	0.0000		
Group ADF-statistic	-3.696956	0.0001		

Table 5. Kao Cointegration Test

	t-Statistic	Probability
ADF	3.697106	0.0001
Residual variance	0.783311	
HAC variance	0.615670	

Sources: Author’s Computation

Model Estimation Results

The results of model estimation are presented in Table 6.

Table 6. Model Estimation Results

Dependent Variable: BPROFGR

Sample: 2010-2022

Variable	Pooled Model		Fixed Effect Model		Random Effect Model	
	Coefficient	t-statistic/Prob.	Coefficient	t-statistic/Prob.	Coefficient	t-statistic/Prob.
INFL	-0.05233	-0.523465 (0.6021)	-0.05986	-0.596745 (0.5525)	-0.052225	-0.522456 (0.6028)
DIVPDG	0.30296	2.935586 (0.0044)***	0.33714	3.157355 (0.0023)***	0.302954	2.929928 (0.0044)***
R	1.627889	2.342268 (0.0217)**	1.65735	2.22861 (0.0252)**	1.627986	2.337773 (0.0220)**
ASBGR	0.00695	1.552636 (0.1246)	0.00742	1.651588 (0.1030)	0.006951	1.549644 (0.1253)
EXCR	0.13962	0.890250 (0.3761)	0.150917	0.959361 (0.3406)	0.139615	0.888534 (0.3770)
LIR	-3.273488	-1.044284 (0.2996)	-3.503631	-1.113698 (0.2691)	-3.273488	-1.113716 (0.3005)
C						
R ²	0.1744		0.2350		0.1744	
R ⁻²	0.1215		0.1181		0.1215	
F-st.	3.2966		2.0108		3.2966	
P.(F-st.)	0.0094		0.0395		0.0094	
D.W sta.	2.1522		2.3380		2.1522	

Source: Author’s Computation

Model Selection Criteria

The study estimated the Pooled Ordinary Least Squares Model, Fixed Effect Model and Random Effect Model for comparison. The results of the estimated models are presented in Table 6. The selection of the appropriate model for data analysis as presented in Tables 7 and 8 was based on the fixed effect likelihood ratio test and the Hausman test respectively. The choice between the Pooled Ordinary Least Square (OLS) and Fixed Effect Models was based on the fixed effect likelihood ratio test while the choice between the fixed effect model and the random effect model was based on Huasman's test result (Nguyen & Le (2015). The null hypothesis that the Pooled Ordinary Least Squares Model was more efficient than the Fixed Effect Model was rejected based on the probability value of the cross-section F statistic (0.4703) which is greater than 5 per cent (Table 7). Also, the null hypothesis that the Random Effect Model was more appropriate than the Fixed Effect Model was tested based on Hausman's test result in Table 4. The study failed to reject the null hypothesis that the Random Effect Model was more appropriate based on the probability of the cross-section Chi-Sq. statistic (1.0000) which is greater than 5 per cent.

Table 7. Fixed Effect Likelihood Ratio

Null Hypothesis: Fixed Effect Model is more appropriate

Effects Test	Statistic	d.f	Probability
Cross-Section F	0.942735	6.71	0.4703
Cross-section Chi-square	6.438881	6	0.3759

Source: Author's Computation

Table 8. Hausman Test

Null Hypothesis: Random Effect Model is Appropriate

Test Summary	Chi- Sq. Statistic	Chi-Sq. d.f	Probability
Cross-Section Random	0.000000	5	1.0000

Source: Author's Computation

Discussion of Results

Based on the selection criteria discussed above, the study analysed the estimation results of the Random Effect Model presented in Table 5. The empirical results obtained from the estimation of the Random Effect Model showed that the value of the coefficient of determination (R-square) stands at 17 per cent; indicating that only about 17 per cent of the systematic variations in the dependent variable – commercial banks profitability growth rate (BPROFGR) in Nigeria was captured by all the explanatory variables in the model. The low R-squared value is however not a major issue (problem) in the result as Iyoha (2004) noted; the coefficients of panel data studies are

sometimes low due to heterogeneity effects. The F-statistic (3.2966) and the corresponding p-value (0.0094) indicate that a significant relationship exists between commercial banks' gross rate and all the explanatory variables in the model combined. The Durbin-Watson statistic of 2.1522 suggests there is no likelihood of autocorrelation in the estimated model.

The individual effects of the explanatory variables on the explained variable were determined based on the coefficient and the sign and size of the p-values of the variables. From the results, the five key independent variables included in the model were the inflation rate, dividend paid-out growth rate, the growth rate of total assets of commercial banks, exchange rate and lending interest rate. The empirical results obtained from the random effect model showed that dividend paid out growth rate, total asset base of commercial banks growth rate, exchange rate and lending interest rate had a positive relationship with the dependent variable- commercial banks profitability growth rate. While inflation had a negative relationship with the dependent variable.

The estimated coefficient of inflation was -0.0522. The result showed that the inflation rate had a negative relationship with commercial bank profitability growth rate. It showed that as the inflation rate went up by one (1) per cent, the commercial bank profit growth rate went down by 0.0522 per cent. However, the coefficient of inflation was not significant in determining commercial banks' profitability in Nigeria during the period of the study; the coefficient of inflation rate failed the significance test at the five (5) per cent level. This result agrees with Mano (2020). The agreement shows that the effect of inflation on commercial banks' profitability is same in Nigeria and Ethiopia.

The coefficient of the dividend paid-out growth rate was estimated at 0.3030. The sign of the estimated coefficient showed that a positive relationship existed between dividends paid out and commercial bank profitability in Nigeria. The result further showed that as dividends paid out to investors increased by one per cent, commercial banks' profits rose by 0.3030 per cent. Besides, the coefficient of dividend paid-out growth rate was significant in determining commercial banks' profitability in Nigeria during the period of the study; the coefficient of inflation rate passed the significance test at the five (5) per cent level. This finding agrees with the finding of Tiep, Thanh, Ha, and Nga (2022). This shows that dividend pay-out is very critical in determining commercial banks' profitability.

The coefficient of commercial banks' asset growth rate was estimated at 1.6279. The result showed that commercial banks asset growth rate had positive relationship with commercial bank profit. It further showed that as commercial bank asset growth rate increased by one (1) percent, commercial banks profit went up by 1.6279 percent during the period of the study. The result is an indication that commercial banks profitability is highly positively impacted by their asset base growth rate. Also, the coefficient of commercial banks asset growth rate was significant in determining commercial banks profitability in Nigeria during the period of the study; the coefficient of commercial banks' asset growth rate passed the significance test at a five (5) per cent level. This result agrees with the empirical resulted obtained by Khan, (2022).

The coefficient of exchange rate was estimated at 0.006951. The result showed that a positive relationship existed between the exchange rate and commercial bank profit during the period of the study. The result further showed that as the exchange rate goes up by one (1) per cent, commercial bank profit goes up by 0.006951. However, the coefficient of the exchange rate was not significant in determining commercial banks' profitability in Nigeria during the period of the

study; the coefficient of exchange rate failed the significance test at the five (5) per cent level. This result disagrees with the finding of Akther, Rahman and Rhaman (2023). The difference could be attributed to differences in banking environment.

The coefficient of lending interest rate was estimated at 0.139615. The result equally showed that there was a positive relationship between lending interest rate and commercial bank profitability during the period of the study, but it did not impact commercial bank profitability significantly; the coefficient of lending interest rate failed the significance test at the five (5) percent level. This result disagrees with the result of Mano (2020). The difference could due to difference in banking environment.

Conclusion

The study investigated the determinants of commercial banks' profitability in Nigeria. The study used an annual panel data set collected on seven Nigerian commercial banks- Access Bank Plc, Fidelity Bank Plc, First Bank Plc, GTBank Plc, Sterling Bank Plc, United Bank for Africa and Zenith Bank Plc. The commercial banks for the study were collected by random sampling technique. Panel data estimation approaches such as pooled ordinary least squares (OLS), fixed effect and random effect models were employed for comparison purposes. The random effect model was more appropriate for data analysis based on the Hausman test result. The findings show that dividend pay-out policy and asset base of commercial banks were important determinants of commercial banks' profitability in Nigeria. The implications of the findings are commercial banks dividend pay-out policy and their asset base are crucial profit determinants in Nigeria.

Recommendations

The study made the following recommendations:

- i. The study recommended that commercial banks should strengthen their dividend pay-out policy to attract dividends orientated shares holders. Investment in the shares of commercial banks will make funds available to commercial banks for more investment in viable projects.
- ii. The study also recommended that commercial banks should boost their assets base to boost their profits.

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