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Effect of Price Levels, Exchange Rates and Interest Rates on Return on Assets of Commercial Banks in Nigeria

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Abstract
The profitability of commercial banks in Nigeria has been characterized by fluctuating trend over the years. Due to the significant roles carried out by commercial banks, this scenario has brought about concerns in the financial sector of Nigeria. The study sought to establish the effect of price levels, exchange rates and interest rates on return on assets of commercial banks in Nigeria. The period 2010 to 2017 was the time scope of the study. The study was based on descriptive, correlation and panel regression analyses which focused on the period 2010 to 2017. The study established that price levels had a significant effect (β=0.003, p=0.0170) on return on assets of commercial banks in Nigeria. The study findings indicate that exchange rates had a significant effect on return on assets (β=-0.0002, p=0.0440). Interest rates had a significant effect on return on assets (β=0.0136, p=0.0090) of commercial banks in Nigeria. The study recommends that the managers of commercial banks in Nigeria should always be in the know of the prevailing economic conditions of the country and that of other countries which they have operational branches. Commercial banks can engage in foreign exchange hedging practices where the fixed forward exchange rates can be used. This will cushion against the potential adverse effect of exchange rates on the assets of commercial banks. The study further recommends that policy makers and regulators (government) should implement policies that will lower the exchange rates which in turn will enhance the value of the local currency. This can be done by upholding restriction policies by government on importation of similar goods which are already manufactured locally in Nigeria. The study further recommends that in periods of high demand for loans, bank managers can take advantage of such periods by charging higher interest rates on loans, however moderately. Price discrimination can also come into play so as to apply different interest rates on loans to different customers which can be guided by their credit history.
Keywords: Price levels, Exchange Rates, Interest Rates, Return on Assets and Commercial Banks
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1.0 Introduction and Background

Commercial banks all over the world perform significant roles in the allocation and distribution of economic resources in countries (Sheefeni, 2015). Banks enhance economic growth of countries by availing funds to customers (borrowers) for investment purposes and as well as financial deepening (Otuori, 2013; Mbekomize & Mapharing, 2017). Channeling of funds from surplus spending units (SSU) to deficit spending units (DSU) is one among the major roles performed by banks in improving efficiency in the financial system (Tariq, Usman, Mir, Aman & Ali, 2014). How they carry out the roles of financial intermediation is dependent on profitability (Ngure, 2014). The profitability of commercial banks therefore, has a direct relationship with the economic growth and development countries.

Commercial banks in Sub-Saharan Africa (SSA) have been characterized by high profits over the years (Boadi, 2015). The average return on assets of banks in the region over the first half of the last two decades stood at about 2% which is significantly higher than those of other parts of the world (particularly developed nations). The high profitability of the banking sector in SSA is attributed to the large gap existing between the demand for and supply of banking services in the region. An indication that Sub-Saharan Africa is characterized by few banks as compared to the demand for banking services; thus bringing about less competitiveness and high interest rates by banks (Ngure, 2014). Apparently, the banking sector in Nigeria is controlled by a few large banks which in turn exercise market power in the industry. Unlike the banking sector in other Sub-Saharan African countries, that of Nigeria is characterized by fluctuating profitability. The economic recession which was largely due to falling international oil prices notably from the year 2014, negatively impacted on banks as they generated less returns on assets compared to previous years (Akinkunmi, 2017).

The profitability of banks in Nigeria as indicated by return on assets has been on a declining trend (Central Bank of Nigeria, 2016). Nigerian banking industry's return on assets had a 2.79 % point decrease from 3.13% to 0.34% as at December 2014 and June 2015 respectively, an indication that averagely, the assets of banks are generating little or no profits. The fall in return on assets is attributed to the growth in average assets, particularly for large banks, and also the sharp decrease in the industry net income. Furthermore, return on assets declined by 1.0 point to 1.3% at end-December 2016 from 2.3% recorded at end-June 2016. In the year 2017, the return on assets of commercial banks in Nigeria was reported at 2.44% (World Bank, 2020).

In order to ensure that banks operate profitably and survive in the long run, it is imperative for banks to assess the factors affecting profitability (Ahmed, 2015). This will enable banks to put in place measures for managing the significant factors, thus, increasing and sustaining profitability (Ngure, 2014). The profitability of commercial banks is linked to price levels, exchange rates and interest rates. These factors are country or sector wide parameters that are not determined by banks but the entire economic activities of a country.

Price levels may have a positive or negative link with bank profits, however, this is dependent on whether inflation is well anticipated or not. Similarly, exchange rate which are attributed to demand and supply forces impact on returns of banks due to activities in the international market (Ahmed, 2015). The impact of interest rates on bank profitability is hinged on the speed and extent to which banks can amend their sources of revenue and cost of funds to match up interest rate fluctuation (Ani, Ugwunta, Ezeudu & Ugwuanyi, 2012). Inflation rate was used to measure price levels, exchange rates were proxied using United States Dollar to Naira exchange rates, bank lending rates (prime rates) were used as a measure for interest rates and lastly, return on assets was proxied by profit before tax to total assets ratio. All measures were in annualized form.

1.1 Statement of the Problem

Profitability serves as the basis for the existence of business entities (Odusanya, Yinusa & Ilo, 2018). Therefore, it remains key for the survival of businesses (Sheefeni, 2015). The fluctuating trend in the return on assets of commercial banks in Nigeria has over the years been a source of concern. This is because the profits of commercial banks remain vital for the financial intermediation role which they perform. The financial intermediation role of commercial banks is hinged on the need to satisfy the ultimate goals and objectives of the banking sector. Banks, like other private businesses or enterprises have private goals (other than the traditional necessity of ensuring perfect role of intermediation) of liquidity, solvency and profitability (Sule, Onwughalu & Batholomew, 2017). Profitability is however considered more important for financial intermediaries (especially commercial banks) as it serves as an evidence of progress and strength which helps in radiating and generating confidence in banks from customers and investors.

Empirical studies on profitability have increased overtime most especially for developed countries and in recent time, in developing countries. Previous studies based on profitability of banks at both country-specific and cross-country levels have linked profitability with price levels, exchange rates and interest rates (Desaro, 2012; Tan & Floros, 2012; Antwi & Apau, 2015; Sheefeni, 2015). However, these studies were based on other countries. The studies done in the context of Nigeria are similarly characterized by various research gaps. Offiong, Riman and Akpan (2016) focused on twelve (12) largest banks in Nigeria. Lambe (2015) assessed profitability using profit after tax based on a single bank which was First Bank of Nigeria (FBN). Additionally, the study by Osamwonyi and Chijuka (2014) focused on listed commercial banks in Nigeria. In view of these research gaps, this study sought to assess the effect of price levels, exchange rates and interest rates on return on assets of commercial banks in Nigeria.

1.2 General Objective

The general objective of the study was to assess the effect of price levels, exchange rates and interest rates on return on assets of commercial banks in Nigeria.

1.2.1 Specific Objectives

The study was guided by the following specific objectives:

i) To establish the effect of price levels on return on assets of commercial banks in Nigeria.
ii) To determine the effect of exchange rates on return on assets of commercial banks in Nigeria.
iii) To examine the effect of interest rates on return on assets of commercial banks in Nigeria.

Null hypotheses were tested in view of the above specific objectives of the study at 0.05 significance level.

1.3 Significance of the Study

The study is of great significance to various groups. The research findings provide comprehensive guidelines to investors, bank managers and other employees of commercial banks. Similarly, the managers of commercial banks will find this study useful as it provides them with recommendations on how to improve return on assets by managing price levels, exchange rates and interest rates. Therefore, the study can be used for reference purposes by financial institutions for implementation of policies relating to price levels, exchange rates, interest rates and return on assets of commercial banks. Furthermore, the study serves as a foundation for upcoming researchers, as it provides basis which serves as guide to other researchers interested in similar field across the world.

2.0 Theoretical Review

The study was guided by Stakeholders Theory and Liquidity Theory of Interest Rates. The prepositions of these theories support the relationship between the study variables.

2.1 Stakeholders Theory

Stakeholders Theory was introduced by Freeman (1984) who presented an argument for the assigning of corporate accountability to different types of stakeholders. Stakeholder Theory notably is based on the notion that a firm is an input-output model which is based on various firm stakeholders which include dealers, employees, customers, suppliers, governmental bodies and the society at large. The theory focuses of various individuals or groups whose activities or actions have resultant effect on the goals and objectives of firms (Fernando, 2009).

The nature of the underlying relationships between firms and stakeholders as regards to the processes of decision making and as well as outcomes is the focus of this theory. Notably, organizations exist to serve various stakeholders. In the context of banking, the primary objective remains profitability. Therefore, the return on assets of commercial banks is linked to the various stakeholders of the banks. The relationship between banks and various stakeholders groups affects the decision making processes of banks.

2.2 Liquidity Theory of Interest Rates

Liquidity Theory of Interest Rates was introduced by Keynes in 1936. The theory views interest rate as solely a monetary phenomenon influenced by the prevailing demand for and supply of money accordingly. Money is demanded in the economy for various reasons which range from consumption to investment purposes (transactionary, precautionary and speculative movies). Banks, just like individuals in the economy will prefer to keep their money as against a high risk of parting with it. The desire to hold cash is referred to as liquidity preference. Lending money implies parting with money for a given period of time. Banks are however, willing to lend money in exchange for a reward termed as interest rates (Bektas, 2014).

Liquidity Theory of Interest Rates is relevant to this study as its prepositions provide the link between interest rates and profits of lending institutions (commercial banks). Banks lend money when they are adequately compensated. The interest rates placed on loans serve as the incentive for lending which has a resultant effect on returns of banks (Appelt, 2016). Higher interest rates bring about higher level of returns and vice versa, as the revenues of banks are largely sourced from lending activities.

2.3 Empirical Review

Ahmed, Rehan, Chhapra and Supro (2018) studied the effect of interest rates on financial performance of banks in Pakistan. Financial performance was assessed using return on equity, earnings per share and return on assets. Data was sourced from twenty (20) commercial banks and State Bank of Pakistan reports. Correlation and regression analyses were employed in the study. The findings of the study revealed that interest rates had significant negative effect on return on assets of commercial banks in Pakistan. However, the study was focused on banks in the context of Pakistan.

Almaqtari, Al-Homaidi, Tabash and Farhan (2018) evaluated the determinants of bank profitability in the Indian context. The study explored both micro and macro characteristics. The study sampled sixty nine (69) commercial banks in India covering the time period 2008 to 2017. Panel regression approach was applied and the regression output indicated that price levels, exchange rates and interest rates significantly predict the return on assets of commercial banks in India. The study however focused on commercial banks in India which operate within different economic conditions from those in Nigeria.

Kohlscheen, Murcia and Contreras (2018) explored the various determining factors of profitability of banks in emerging markets. The study focused on nineteen (19) emerging markets and the sample comprised of selected five hundred and thirty four (534) private commercial banks. The distribution of the sample was based on seven (7) economies from Asia, five (5) each from central and Latin America, Eastern Europe and also South Africa and Israel were included. The time scope for the study was 2000 to 2014. Findings from the empirical analysis indicated that price levels had a significant negative effect on return on assets of banks. The study largely focused on a cross country analysis which was based on various economies. Akani, Nwanna and Mbachu (2016) assessed the effect of selected external variables on performance of commercial banks in Nigeria. Data was collected on the study variables from 1980 to 2014. The data analysis of the study was undertaken using co-integration and vector error correlation model (VECM). The results of the study revealed that exchange rates had significant positive effect on return on assets of commercial banks in Nigeria.

Offiong *et al*. (2016) did an empirical analysis on foreign exchange fluctuation and profitability of commercial banks in Nigeria. The study employed balanced panel methodology while focusing on twelve (12) largest banks in Nigeria. Eight (8) of the selected commercial banks were national banks and the remaining four (4) where international banks as they have sufficient capital to have operational branches in other countries. The findings from the panel regression analysis revealed that both the American dollar and the British pounds had significant negative effect on profitability of commercial banks. The yen however had a significant positive effect on profitability of commercial banks in Nigeria. Maigua and Mouni (2016) evaluated the influence of exchange rates on performance of commercial banks in Kenya. The study sampled twenty six (26) commercial banks from a population of 43 banks. Multiple regression analysis was applied and the outcome indicated that exchange rates

had a significant negative effect on return on assets. The former however focused on twelve (12) largest banks in Nigeria while the latter was based on commercial banks in Kenya.

Lambe (2015) examined the linkages between exchange rates and profitability of biggest banks in Nigeria with focus on First Bank of Nigeria. The study utilized secondary data for seventeen (17) years spanning from 1997-2013. The study employed the auto regressive methodology and it was documented that exchange rates had significant positive relationship with profitability as measured by profit after tax (PAT). He, Fayman and Casey (2014) examined the profitability of banks while focusing on 22 largest commercial banks in United States of America. The study employed panel data methodology and found that large banks in United States are susceptible to foreign exchange fluctuation. The study specifically established that the relative value of U.S dollar to a basket of Asian currencies and a basket of European currencies had a significant positive impact on the level of profitability of largest banks in United States. The former however, was based on a single (First Bank of Nigeria) and the latter focused on twenty two (22) large banks in United States.

Osamwonyi and Chijuka (2014) analyzed the effect of macroeconomic variables on the profitability of listed commercial banks in Nigeria. The study focused on the period 1990 to 2013 and pooled ordinary least method was used. The findings from the regression analysis indicated that interest rates had a negative and significant effect on return on equity of banks in Nigeria. Kanwal and Nadeem (2013) assessed the impact of external factors on profitability of listed commercial banks in Pakistan. The study documented that real interest rates had a positive and significant impact on return on assets. Notably, the study focused on listed commercial banks in Pakistan. In view of the contextual gap, the present study focused on commercial banks in Nigeria.

Ali, Akhtar and Ahmed (2011) studied the impact of bank specifics and external variables on bank profitability in Pakistan. The analysis focused on the period between the years 2006 through 2009 with the use of least square methodology. The study indicated a negative and significant impact of price levels on return on assets. Khrawish (2011) assessed the determinants of bank performance in the context of Jordan. The study focused on commercial banks for the time period 2000 through 2010 where multiple regression model was utilized for the analysis of research data. Research findings indicated that exchange rates have positive and significant relationship with return on assets. As such the findings may not be applicable to commercial banks in Nigeria due to the different economic conditions of countries.

Alper and Anbar (2011) investigated the micro and macro determinants of bank profitability in Turkey for the time scope ranging from the years 2002 to 2010. The study found that real interest rate is a significant determinant as it impacts positively on profitability of banks. However, the study was exploratory as it centered on determinants of profitability of commercial banks in Turkey. The current study was causal in nature (as it focused on cause and effect relationships) in the context of commercial banks in Nigeria.

Gul, Irshad and Zaman (2011) examined the nexus between micro and macro characteristics and bank profitability in Pakistan. The top 15 commercial banks in Pakistan constituted the sample of the study. The analysis of data was based on pooled ordinary least squares (POLS) and findings indicated that price levels have positive and significant nexus with profitability of banks. Notably, the study was focused on banks in Pakistan unlike the present study which is on commercial banks in Nigeria.

Flamini, McDonald and Schumacher (2009) assessed the determining factors of bank profitability for countries in Sub-Saharan Africa. The study was based on linear regression analysis were the annual data of 387 banks in 41 countries in Sub-Saharan Africa was utilized. The time scope of the study was the period 1998 to 2006. The study found that price levels had a positive and significant effect on return on assets of banks. The study was based on a cross country analysis of commercial banks in Sub-Saharan Africa. As such, the study recommended country specific studies so as to provide precise country level findings and conclusions.

3.0 Methodology

The present study adopted causal research design. The choice of causal research design is based on the fact that it is quantitative, preplanned and also structured in nature. Positivism doctrine was adopted in the study. The study was based on purposive sampling design where the focus was the seventeen commercial banks which fully operated in Nigeria for the period 2010 to 2017. However, due to unavailability of data, only fifteen of these banks were covered. The study was based on panel data which comprises of both cross sectional and time series dimensions. In view of this, the analysis of data was carried out within the framework of panel regression analysis. The general model of the study was adopted from Al-Khouri (2012) as follows:

$Y_{it}=\beta_0+\beta X'_t+\varepsilon$ ……1

Where:

Y_{it} = Return on Assets

$_i$ = Commercial Bank

$_t$ = Time Period

X' = Vector of independent variables at time t (price levels, exchange rates and interest rates)

β = Coefficients

β_0 = Constant term
ε = Error term
Equation 1 above was decomposed into equation 2 which was utilized for estimation.
$ROA_{it} = \beta_0 + \beta_1 PL_t + \beta_2 ER_t + \beta_3 IR_t + \varepsilon$ …..…… ……..…..……2
Where:
ROA_{it} = Return on Assets for commercial bank $_i$ at time $_t$
PL_t = Price Levels at time $_t$
ER_t = Exchange Rates at time $_t$
IR_t = Interest Rates at time $_t$
$\beta_1, \beta_2, \beta_3$ = Coefficients
ε = Error term

4.0 Descriptive Analysis and Presentation

This section provides the descriptive analysis on the study variables. The descriptive analysis provides statistics includes the minimum and maximum values; mean and standard deviation of the study variables namely price levels, exchange rates, interest rates and return on assets (ROA) for the period 2010-2017. The descriptive statistics are presented in Table 1.

Table 1: Descriptive Statistics

	PL	ER	IR	ROA
Minimum	8.00	150.30	16.01	-0.020
Mean	11.71	220.72	16.67	0.025
Maximum	18.55	305.79	17.59	0.170
Std. Deviation	3.10	47.83	0.41	0.029

Source: Study Data (2019)

Key: PF=Price Levels, ER= Exchange Rates, IR= Interest Rates and ROA= Return on Assets

The descriptive statistics in Table 1 indicated that the predictor variables had means above the standard deviations, thus reducing the likelihood of outliers or random errors in the data set. Price levels had minimum and maximum values of 8.00 and 18.55 respectively. A mean and standard deviation of 11.71 and 3.10 respectively were further reported for price levels. This therefore is an indication that price levels relatively fluctuated over the study period.

Exchange rates reportedly had a minimum value of 150.30 and a maximum value of 305.79. This is an indication that the study period was characterized by high exchange rates fluctuation which is further supported by a mean of 220.72 and a standard deviation of 47.83. Interest rates had minimum and maximum values of 16.01 and 17.59 respectively. Interest rates further had a mean of 16.67 and standard deviation of 0.41. This therefore indicates that interest rates highly fluctuated within the period 2010 to 2017.

4.1 Pre and Post Estimation Tests

Various pre and post estimation tests were carried out so as to ensure that the assumptions of classical linear regression model (CLRM) were not violated.

4.1.1 Normality Test

Test for normality determines whether the data is well modeled and normally distributed (linear). It is used to measure how far the data deviates from the Gaussian by looking at the graph and determining if the distribution deviated grossly from a bell shaped normal distribution. To test the normality of the variables, the Jarque-Bera (JB) and normality graph were utilized. The results in Figure 1 indicate that the residuals were normally distributed. In testing for normality, the Jarque-Bera test was preferred as compared to the graphical approach due to its more comprehensive nature (Gujarati, 2003). The results of the test are presented in Figure 1.

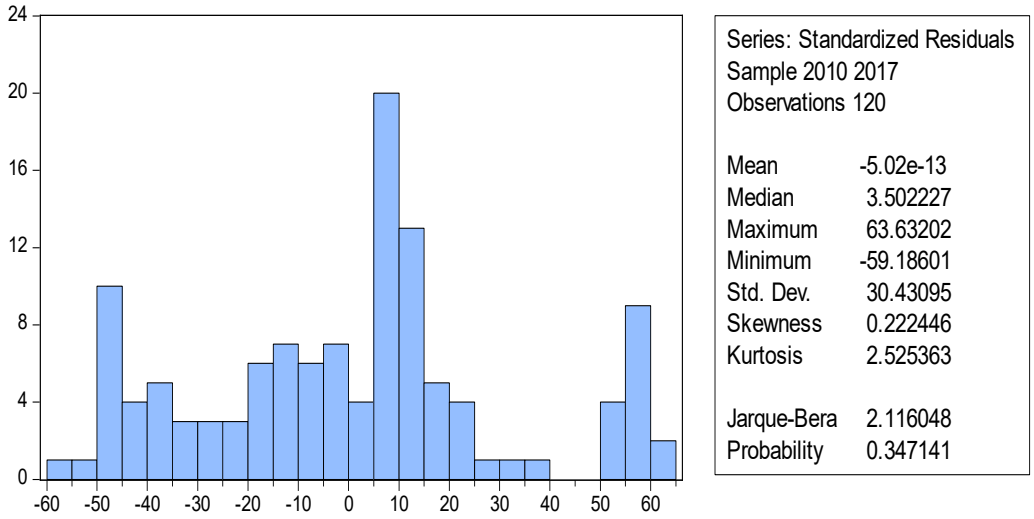

Figure 1: Histogram for Normality Test

Source: Study Data (2019)

The null hypothesis for this test stated that the data set has a normal distribution. The results in Figure 1 indicate that the p-value for the residual was above 0.05, therefore, the study failed to reject the null hypothesis and this implied that the data set had a normal distribution. In line with Brooks (2008), the evidence of a normal distribution of the residuals implied that the OLS regression methodology can be utilized for purposes of estimating the panel regression models.

4.1.2 Heteroscedasticity Test

Heteroscedasticity test was carried out for the purpose of testing whether the error terms are correlated across observation in the time series data. The error terms from a regression model must have a constant variance called homoscedastic. To ascertain whether the residuals met this criterion, the study applied the Breusch-Pagan test for heteroscedasticity where the null hypothesis stated that the residuals are homoscedastic. A p-value of >0.05 implies the existence of constant variance. The results are shown in Table 2.

Table 2: Heteroscedasticity Test Results

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

H_o: Constant variance

Variable: fitted values		**ROA**
chi2(15)	=	2294.58
Prob> chi2	=	0.0000

Source: Study Data (2019)

Based on the findings in Table 2, the null hypothesis was therefore rejected at 0.05 significance level since the reported p-value was 0.0000. The data therefore suffered from heteroscedasticity. The model was corrected using robust standard errors which is a technique applied for purposes of obtaining unbiased standard errors of OLS coefficients under a condition of heteroscedasticity. This was done because the presence of heteroscedasticity violates the assumptions of Gauss Markov that are required for rendering OLS the best linear unbiased estimator (BLUE).

4.1.5 Stationarity Test

The study conducted a stationarity test on the variables used for purposes of avoiding spurious regressions. Unit root test was conducted using the LLC test and the findings are presented in Table 3.

Table 3: Stationarity Test Results

Variable name	t-Statistic(adjusted)	P-value	Comment
ROA	5.3281	0.0224	Stationary
Price Levels	7.8314	0.0006	Stationary
Exchange Rates	7.7817	0.0494	Stationary
Interest Rates	9.8060	0.0000	Stationary

Source: Study Data (2019)

The findings in Table 3 indicate that all the research variables are stationary (that is, absence of unit roots) at 0.05 level of significance.

4.1.3 Autocorrelation Test

The study carried out autocorrelation test for purposes of establishing whether the residuals were correlated with respect to time. The study employed the Wooldridge Test for autocorrelation. The null hypothesis of this test was

that there is no first order serial correlation in the data (Brooks, 2008). The results are presented in Table 4.

Table 4: Serial Correlation Tests

Wooldridge test for autocorrelation **H_0: no first-order autocorrelation**
F(1, 14) = 40.700
Prob> F = 0.000

Source: Study Data (2019)

The findings in Table 4 indicate that the F statistic had a value of 40.700 and a p-value of 0.000. The study rejected the null hypothesis and thus concluded that there was a problem of serial correlation covariance. The study corrected the problem of serial correlation covariance by applying the robust standard errors in the regression.

4.1.4 Multicollinearity Test

The study tested for multicollinearity by generating the Variance Inflation Factor (VIF) output. The VIF of less than 5 for the independent variables is recommendable for eliminating the probability of excessive level of multicollinearity. The findings from the VIF test are presented in Table 5.

Table 5: Multicollinearity Test Results

Variables	VIF	Remark
Price Levels	2.45	No Multicollinearity
Exchange Rates	1.67	No Multicollinearity
Interest Rates	2.20	No Multicollinearity

Source: Study Data (2019)

The result in Table 5 indicates non-existence of a multicollinearity problem among the predictor variables, therefore, the multicollinearity level in the model is minimal and can be tolerated.

4.1.6 Test for Fixed Effect or Random Effect Model

In order to make a decision on the most suitable model to use in a panel regression, both random effect and fixed effect models are estimated. The study used the Hausman's specification test (1978) to choose between fixed and random effect models. The results of the hausman test are presented in Table 6.

Table 6: Hausman Test for Return on Assets

	ROA			
	(b) Fixed	(B) Random	(b-B) Difference	Sqrt (diag(V_b-V_B)) S.E.
Price Levels	0.003	0.003	0.000	0.000
Exchange Rates	0.000	0.000	0.000	0.000
Interest Rates	0.008	0.014	-0.005	0.002
chi2(3)	6.920			
Prob>chi2	0.075			

Source: Study Data (2019)

Table 6 provides the findings of the hausman test where the null hypothesis stated that the random effect model is preferred against the fixed effect model. The hausman test yielded a chi-square of 6.920 and a p-value of 0.075, thereby indicating that at 0.05 significance level, the chi-square value obtained is statistically insignificant. As such, the study failed to reject the null hypothesis that random effect model is the preferred model. The study therefore utilized the random effect model for estimation.

4.2 Correlation Analysis

The correlation analysis was done at 0.05 significance level as indicated by one asterisk (*).
The correlation results are presented in Table 7.

Table 7: Correlation Test Results

Variables	ROA	Price Levels	Exchange Rates	Interest Rates
ROA	1.000			
Price levels	0.654* 0.000	1.000		
Exchange rates	-0.605* 0.000	-0.613* 0.000	1.000	
Interest Rates	0.610* 0.000	0.724* 0.000	-0.555* 0.000	1.000

Source: Study Data (2019)

The results in Table 7 indicate that price levels (r=0.654, p=0.000) had a positive and significant correlation with return on assets. Abel and Le Roux (2016) similarly documented a positive correlation between price levels

and return on assets of commercial banks in Zimbabwe. Exchange rates (r=-0.605, p=0.000) had a negative and significant correlation with return on assets. Interest rates (p=0.610, r=0.000) had a positive and significant correlation with return on assets of commercial banks in Nigeria. The findings collaborate those of Obamuyi (2013) and Chimkono (2016) who documented a positive and significant correlation between interest rates and return on assets of commercial banks in Nigeria and Malawi respectively. Price levels and interest rates had positive coefficients, thus, implying that their increase led to an increase in return on assets of commercial banks. However, the coefficient for exchange rates was negative which indicates that its increase led to a corresponding decrease in return on assets of commercial banks in Nigeria.

4.3 Panel Regression Analysis

This section presents the regression output which was used to test the various hypotheses of the study. The regression results are documented in Table 8.

Table 8: Regression Results

ROA	Coef.	Std. Err.	T	P>|t|	[95% Conf.	Interval]
Price Levels	0.0030	0.0013	2.3800	0.0170	0.0005	0.0055
Exchange Rates	-0.0002	0.0001	-2.0200	0.0440	-0.0003	0.0000
Interest Rates	0.0136	0.0052	2.6200	0.0090	0.0034	0.0237
_cons	-0.1992	0.0949	-2.1000	0.0360	-0.3851	-0.0132
R-sq: Overall = 0.5165						
F statistics = 47.49						
Prob> chi2 = 0.0000						

Source: Study Data (2019)

Based on the analysis in Table 8, the following regression function was extracted:

Return on Assets = -0.1992 + 0.003 PL - 0.0002 ER + 0.0136 IR + ε

Where:

PL = Price Levels
ER = Exchange Rates
IR = Interest Rates

The results presented in Table 8 indicate an R squared of 0.5165. This implies that price levels, exchange rates and interest rates collectively had high explanatory power on return on assets. The F statistics value was 47.49 with a p-value of 0.000 which indicates significance. The positive coefficient of 0.003 indicates that a unit increase in price levels increases the return on assets of commercial banks by 0.003.

The coefficient of exchange rates as contained in Table 8 was (β=-0.0002). The negative coefficient in the findings indicates that a unit increase in exchange rates decreases the return on assets of commercial banks in Nigeria by 0.0002. Furthermore, interest rates had a coefficient of (β=0.0136). This implies that increases in interest rates on loans by 1 unit result in a corresponding increase in the return on assets of banks by 0.0136.

4.4 Hypotheses Testing

Various null hypotheses were formulated and tested in line with the specific objectives of the study.

H_{01}: Price Levels have no Significant Effect on Return on Assets of Commercial Banks in Nigeria

Firstly, the study sought to examine the effect of price levels on return on assets of commercial banks in Nigeria and the findings are as presented in Table 8. The corresponding null hypothesis was tested at 0.05 significance level. The results (p= 0.0170) indicate significance. Hence, the null hypothesis which stated that price levels have no significant effect on return on assets of commercial banks in Nigeria was rejected at 0.05 level of significance. This can also be attributed to the notion that in periods of increases in price levels, the real purchasing power of money depreciates; thereby providing enablement for borrowers to pay back loans obtained which in turn translates into higher levels of bank profitability. This further reveals that price levels had been fully anticipated by bank management.

The findings of the study are in agreement with the studies by Almaqtari *et al*. (2018) and Kohlscheen *et al*. (2018) for commercial banks in India and for emerging markets respectively. The study findings further collaborate those of Ali *et al*. (2011); Gul *et al.* (2011) who documented that price levels have significant effect on profitability of commercial banks in Pakistan. The result of the study is further supported by Flamini *et al*. (2009) who also established that price levels have significant effect on profitability of commercial banks with regards to return on assets of banks in Sub-Saharan Africa.

H_{02}: Exchange Rates have no Significant Effect on Return on Assets of Commercial Banks in Nigeria

Secondly, the study sought to examine the effect of exchange rates on return on assets of commercial banks in Nigeria. In line with this objective, the null hypothesis above was formulated and tested at 0.05 significance level. The findings in Table 8 of (p=0.044) indicated that exchange rates had a significant effect on return on assets. Hence, the null hypothesis that exchange rates have no significant effect on return on assets of commercial banks

in Nigeria was rejected at 0.05 level of significance. The findings on the effect of exchange rates on return on assets can be attributed to the contention that increasing levels of exchange rates indicate depreciation in the local currency. As such, assets (or liabilities) holdings of commercial banks which have net payment streams denominated in foreign currencies are negatively affected by exchange rates.

The findings of the study with respect to exchange rates and profitability of banks are in agreement with those of Almaqtari *et al*. (2018), Akani *et al.* (2016), Maigua and Mouni (2016), Offiong *et al.* (2016); Lambe (2015), He *et al.* (2014) and Khrawish (2011). The authors similarly found that exchange rates have a significant effect on profitability of commercial banks. Banks engage in international transactions especially large banks with branches in other countries. Banks are therefore susceptible to exchange rate fluctuation.

H_{03}: Interest Rates have no Significant Effect on Return on Assets of Commercial Banks in Nigeria

Thirdly, the study sought to establish the effect of interest rates on return on assets of commercial banks in Nigeria. The findings on this hypothesis are contained in Table 8. To achieve this objective, a null hypothesis which stated that interest rates have no significant effect on return on assets of commercial banks in Nigeria was formulated and tested. The p-value of 0.0090 in Table 8 indicates that interest rates had a significant effect on return on assets. The corresponding null hypothesis which stated that interest rates had no significant effect on return on assets of commercial banks in Nigeria was therefore rejected at 0.05 significance level. The results indicate that an increase in interest rates increases the return on assets of commercial banks in Nigeria. This can be linked to the notion that banks largely depend on loans as a major source of income, therefore increasing interest rates on loans increases the profitability levels of commercial banks.

The findings of the study on interest rates and return on assets are in line with liquidity theory of interest rates which postulates that lenders are willing to part ways with liquidity for a specific period of time at a given reward (interest). Therefore, with higher interest rates, lenders are willing to part ways with more liquidity which in turn yields higher profitability. In agreement with this result are the findings by Ahmed *et al*. (2018) and Almaqtari *et al*. (2018) who found that interest rates had a significant effect on return on assets of commercial banks in Pakistan and India respectively. Additionally, Osamwonyi and Chijuka (2014), Kanwal and Nadeem (2013) and Alper and Anbar (2011) also documented that interest rates had a significant effect on profitability of commercial banks in Nigeria, Pakistan and Turkey respectively.

5.0 Conclusion and Recommendations

The findings of the study have significant implications for various stakeholders which include the management of commercial banks, policy makers and regulators. The study established that price levels significantly predict the return on assets of commercial banks in Nigeria. The study recommends that the managers of commercial banks in Nigeria should always be in the know of the prevailing economic conditions of the country and that of other countries which they have operational branches. This will in turn assist bank managers in fully anticipating the changes or fluctuation in price levels. In the case where price levels are well anticipated, the management of commercial banks can adequately adjust interest rates to cushion against any negative effect of rising price levels. The Central Bank of Nigeria should implement policies that will curtail price levels which will in turn ensure a profitable and in the long run sustainable banking sector.

The study concluded that exchange rates are major predictors of return on assets of commercial banks in Nigeria. As such, the managers of commercial banks can engage in foreign exchange hedging practices where the fixed forward exchange rates can be used. This will cushion against the potential adverse effect of exchange rate fluctuation on the assets of commercial banks. The study further recommends that policy makers and regulators (government) should implement policies that will lower the exchange rate which in turn will appreciate the value of the local currency. This can be done by upholding restriction policies by government on importation of similar goods which are already manufactured locally in Nigeria.

The study concluded that the effect of interest rates on return on assets of commercial banks in Nigeria was significant. The study therefore recommends that in periods of high demand for loans, bank managers can take advantage of such periods by charging higher interest rates on loans, however moderately. Price discrimination can come into play so as to apply different interest rates on loans to different customers which can be guided by their credit history.

5.1 Contribution to Knowledge

The findings of the study have various contributions to the existing body of knowledge on the linkages between price levels, exchange rates, interest rates and return on assets of commercial banks. The study was anchored on Stakeholders Theory and Liquidity Theory of Interest Rates. The study contributed in expanding the applicability of Stakeholders Theory as it relates to the returns of banks which is a function price levels, exchange rates and interest rates.

Liquidity theory of interest rates was used to provide insight on the link between interest rates and return on assets of commercial banks. Interest rate is a function of the demand and supply of money in the economy. It also

serves as a reward for lenders parting ways with liquidity for an agreed time period. The study findings contribute to knowledge by successfully testing the research hypotheses which stated that price levels, exchange rates and interest rates have no significant effect on return on assets of commercial banks in Nigeria.

REFERENCES

Abel, S. & Le Roux, P. (2016). Determinants of Banking Sector Profitability in Zimbabwe. *International Journal of Economics and Financial Issues,* 6(3), 845-854.

Ahmed, A., Rehan, R., Chhapra, I., U. & Supro, S. (2018). Interest Rate and Financial Performance of Banks in Pakistan. *International Journal of Applied Economics, Finance and Accounting*, 2 (1), 1-7.

Ahmed, L., (2015). The Effect of Foreign Exchange Exposure on the Financial Performance of Commercial Banks in Kenya. *International Journal of Scientific and Research Publication.* 5 (11), 115-120.

Al-Khouri, R (2012). Bank Characteristics and Liquidity Transformation: The Case of GCC Banks. *International Journal of Economics and Finance,* 4 (12), 114-120.

Akani, H. W, Nwanna, I & Mbachu, A (2016) Effect of Selected Macroeconomic Variables on Commercial Banks Performance in Nigeria. *IARD International Journal of Banking and Finance Research,* 2 (3) 2406-8634.

Akinkunmi, M. (2017). Determinants of Banks' Profitability in Nigeria: Does Relative Market Power Matter? *Journal of Finance and Bank Management,* 5 (1), 42-53.

Ali, K., Akhtar, M. F., & Ahmed, Z. (2011). Bank-Specific and Macroeconomic Indicators of Profitability-Empirical Evidence from the Commercial Banks of Pakistan. *International Journal of Business and Social Science,* 2 (6), 235-242.

Alper, D. & Anbar, A. (2011). 'Bank Specific and Macroeconomic Determinants of Commercial Bank. Profitability: Empirical Evidence from Turkey', *Business and Economics Research Journal*, 2 (2), 139-152.

Almaqtari, F. A., Al-Homaidi, E. A., Tabash, M. I & Farhan, N. J (2018). The Determinants Of Profitability Of Indian Commercial Banks: A Panel Data Approach. *International Journal of Finance and Economics,* 24 168–185.

Ani, W. U., Ugwunta, D. O., Ezeudu, I. J. & Ugwuanyi, G. O.(2012) An empirical assessment of the determinants of bank profitability in Nigeria: Bank characteristics panel evidence. *Journal of Accounting and Taxation,* 4 (3), 38-43.

Antwi, F. & Apau, E. V. 2015. 'Financial Performance of Rural and Community Banks (RCBs) in Ghana', *The International Journal Of Business & Management,* 3 (2), 76-85.

Appelt, K (2016). Keynes' Theory of the Interest Rate: A Critical Approach. *Club of Economics in Miskolc' TMP,* 12 (1), 3-8.

Bektas, E. (2014). Are the determinants of bank net interest margin and spread different? The case of North Cyprus. *Banks and Bank Systems,* 9(4), 82-91.

Boadi, I (2015). Profitability Determinants of the Ghanaian Banking Sector in Ongoing Wave of Consolidation. *International Journal of Business and Management*, 10 (12), 1-11.

Brooks, C. (2008). *Introductory Econometrics for Finance*. Cambridge University Press. Cambridge: 161.

Central Bank of Nigeria (2016). Financial Stability Report*; Reuters – Fitch: Nigeria Bank Street Test Highlights Disparity in Capital.*

Chimkono, C. C. (2016). *Effect of Micro and Macro-Economic Factors on Financial Performance of Commercial Banks in Malawi.* Unpublished Phd Thesis, Jomo Kenyatta University of Agriculture and Technology, Kenya.

Desaro, A. I. (2012) *The effect of macroeconomic factors on financial performance of commercial banks in Kenya*. MSC Project, University of Nairobi, Kenya.

Fernando, A. (2009). Corporate Governance Principles, Policies and Practices. Dorling Kindersley (India) Pvt. Ltd

Flamini, V., McDonald, C. A., & Schumacher, L. B. (2009). The determinants of commercial bank profitability in Sub-Saharan Africa. *IMF Working Papers* (9), 1-30.

Freeman, R.E (1984). Strategic Management: A stakeholder Approach. Pitman, London

Gul, S., Irshad, F., & Zaman, K. (2011). Factors Affecting bank Profitability in Pakistan. *The Romanian Economic Journal,* 14 (39), 60-87.

Gujarati, D.(2003) .*Basic Econometrics*. 4th ed. McGraw Hill pg. 638-640, New York.

He, L. T., Fayman, A. & Casey, K, M (2014). Bank Profitability: The Impact of Foreign Currency Fluctuations. *Journal of Applied Business and Economics,* 16 (2), 98-104.

Kanwal, S., & Nadeem, M. (2013). The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. *European Journal of Business and Social Sciences,* 2 (9), 186-201.

Khrawish, H. A. (2011). Determinants of commercial banks performance: evidence from Jordan. *International Research Journal of Finance and Economics,* 5 (5), 19-45.

Kohlscheen, E., Murcia, A & Contreras, J. (2018). Determinants of bank profitability in emerging markets. *BIS Working Papers No 686* Monetary and Economic Department. Bank for International Settlement. Page 1-24

Lambe, I. (2015). Assessing the Impact of Exchange Rate Risk on Banks Performance in Nigeria. *Journal of*

Economics and Sustainable Development, 6 (6), 1-13.

Maigua, C & Mouni, G (2016). Influence of Interest Rates Determinants on the Performance of Commercial Banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6 (2), 121–133.

Mbekomize, C. J & Mapharing, M. (2017). Analysis of Determinants of Profitability of Commercial Banks in Botswana. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7 (2), 131–144.

Ngure, I. M (2014). *The Effect of Interest Rates on Financial Performance Of Commercial Banks in Kenya*. Unpublished MBA Project University Of Nairobi, Kenya.

Obamuyi, T. M. (2013). Determinants of Banks' Profitability in a Developing Economy: Evidence from Nigeria. *Organizations and Markets in Emerging Economies,* 4 (8), 97-111.

Odusanya, I. A., Yinusa, O. G. & Ilo, B, M. (2018). Determinants of firm Profitability in Nigeria: Evidence from dynamic panel models. *Journal of Economics and Business,* 68 (1) 43-58.

Offiong, A., Riman, H., B. & Akpan, E., S (2016). Foreign exchange fluctuations and commercial banks profitability in Nigeria. *Research Journal of Finance and Accounting,* 7 (18), 121-126.

Osamwonyi, I. O & Chijuka, I. M (2014) The Impact of Macroeconomic Variables on the Profitability of Listed Commercial Banks in Nigeria. *European Journal of Accounting Auditing and Finance Research,* 2 (10), 85-95.

Otuori, O.H. (2013). Influence of exchange rate determinants on the performance of commercial banks in Kenya. *European Journal of Management Sciences and Economics,* 1 (2), 86-98.

Sheefeni, J. P (2015). The Macroeconomic Determinants of Profitability among Commercial Banks in Namibia. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB) An Online International Research Journal.* 4 (1), 1414-1431.

Sule, O. E., Onwughalu, . & Batholomew, P. (2017). Macro-Economic Policies and the Performance of Nigerian Financial Institutions. *International Journal of Management Science,* 4(5), 66-71.

Tan, Y & Floros, C. (2012). Bank Profitability and Inflation: The Case of China. *Journal of Economic Studies,* 39 (6), 675 – 696.

Tariq, W., Usman, M., Mir, H.Z., Aman, I. & Ali, I. (2014). Determinants of Commercial Banks Profitability: Empirical Evidence from Pakistan. *International Journal of Accounting and Financial Reporting,* 4(2), 2162-3082.

World Bank (2020), Bank's Return on Assets for Nigeria [DDEI05NGA156NWDB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/DDEI05NGA156NWDB, February 14, 2020.