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Adekunle Ajasin University,
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VOLATILITY CONTENTS OF EXCHANGE RATE AND PROFITABILITY OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Organizations exist in a dynamic environment and the failure of organizations to manage their foreign exposures well may have adverse effects on their returns. The study investigated the effect of volatility in foreign exchange rates on Nigerian deposit money banks' profitability. The target population constitutes 22 listed banks and 7 deposit money banks was selected as sample size using purposively sampling techniques. The regressions showed that foreign exchange rate volatility has a positive effect on return on assets, return on equity, and capital adequacy ratio. An increase in exchange rate volatility results in a 6.52%, 78.81%, and 38.53% increase in return on assets, return on equity, and capital adequacy ratio, respectively. However, these positive effects are insignificant as the p-value of 0.3403, 0.767, and 0.1877 are greater than the 10%, 5%, and 1% levels of significance. The regression results also showed that foreign exchange rates affect the net interest margin of Nigerian deposit money banks. An exchange rate increase of one unit leads to a net interest margin decrease of 3.25 percent. The negative effect is nevertheless negligible since the p-value of 0.7008 is higher than 5%. It was concluded that the profitability of Nigerian deposit money banks is influenced by the foreign exchange rate, inflation, interest rate, and bank size. According to the findings, robust foreign exchange rate policies could be instituted by bank management as an efficient measure of managing exchange rate risk.

Keywords: Banks, Capital, Foreign exchange, Profitability, Volatility
JEL Classification: F31, G21

1. Introduction

Profitability is the ability of a business to achieve a substantial financial gain for the investment owner (Buffett, 2005). The performance of DMB is important for the future of its operations, and hence, the various determinants must be understood and their effects on the banks' profitability should be disscused. Exchange transactions are an important part of the financial industry and the world's largest financial market (Anyafo, 1999). Exchange for foreign trade is the means of international transaction

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settlement and acts as the mechanism for interaction between foreign-exchange sellers and buyers to negotiate an appropriate price, hence promoting cross-border transactions (Ani, Ugwunta, & Okanya, 2013).

Foreign exchange means dealings in foreign currency. It can also include foreign currency denominated assets. Foreign assets are used to perform foreign currency functions, i.e., a form of international payments or trade, a form of deferred payments in international transactions, and an internationally utilisable liquid store of wealth. The financial sector is heavily influenced by market activities due mainly to the financial intermediation position of banks. Furthermore, exchange rate management is essential to the general welfare due to the scale, location, and diversity.

This is the age of global financial integration, hence, the effect of foreign exchange fluctuations on the profitability of deposit money banks cannot be overemphasised. Due to the global existence of financial institutions, they are mostly affected by the volatility of the exchange rate. Deposit money banks are experiencing profits' erosion due to exposure to international currency volatility, especially where hedging strategies are not employed and the demand and supply for foreign currency also grow as the international market becomes more competitive and foreign exchange transactions volume is boosted. As a consequence, exchange rates are increasing or falling steadily, which leads to many economic losses that are highly unpredictable.

The dynamics in the market environments in which organizations operate have drastically changed in the past decade as characterized by globalization and advancements in technology (Kipchirchir, 2011). This has necessitated the leadership of organizations to constantly evaluate and determine the factors that regulate how the firms perform, particularly macro-economic variables such as exchange rates are influencing not only company returns but also business sustainability.

The Nigerian exchange rate currently consists of the multiple exchange regime that comprises the Central Bank of Nigeria (CBN) official exchange rate and inter-bank rate (it allows banks to lend to each other); others are used by firms ivolved in foreign-based money transfers, the I&E window developed in April 2017 for importers and exporters, as well as a black-market rate. The study's primary objective is to determine how the financial profitability of selected banks quoted on the Nigerian Stock Exchange is affected by exchange rate volatility. Other specific objectives pursued to actualise the broad objective are to determine how the volatility of foreign exchange rates affects the profitability of selected listed Nigerian banks; evaluate the effect of inflation rate on the listed Nigerian banks' profitability; examine the

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profitability effect of interest rates for listed banks in Nigeria; and to also assess the impact of the size of the listed Nigerian banks on their profitability.

Prior studies have covered various variables on the profitability of DMBs with mixed results in opposite directions. Such studies include; Lagatand Nyandema (2016), Manyo, Sabinaand Ugochukwu (2016), Wagdi and Bektaş (2018), and Okika, Udeh, Francis, and Okoye (2018). However, the uniqueness of this work hinges on the firm-specific measurement of profitability (net interest margin, return on assets, capital adequacy ratio, and return on equity) adopted which also lend to the credibility and consistency of our findings, whereas other studies used a single measurement of profitability, mostly Return on Assets (ROA). It also focused on banks that have not undergone any merger or acquisition recently and also proves to be very recent as compared to prior studies that have been carried out to the researcher's best knowledge.

2. Literature review and hypothesis development

2.1 Conceptual Clarifications

2.1.1 Exchange Rate

Exchange rate is the local currency value for a unit of foreign currency. It is not fixed because the currency value is determined by time or the currency involved. Some currencies may be higher than others, but it is called depreciation when the value declines. There are several factors that contribute to exchange rate increase or decrease, primarily the balance between demand and supply. These changes take place unexpectedly and often seem hard to foresee. The changes also affect the efficiency of the company. However, it mostly limited to organisations which operate mostly in international transactions or currencies, whereas local investors would have little effect as such a high exchange rate will prohibit most foreign investors from performing any transactions (Nyandema & Langat, 2016). Banks would also be impacted by the weakening of domestic currencies, resulting in decreased transactions such as deposits and borrowing.

2.1.1.1 Exchange rate and bank performance

The fluctuations in currencies are directly and indirectly affecting the banks. The direct effect is derived from the assets (or liabilities of banks) that are kept in a foreign currency and have net payment sources. Foreign exchange rate changes according to the prices of these assets in the domestic currency. It is the most clearly identifiable and most easily secure source of foreign exchange risk (Popper, 1996). A bank could be indirectly exposed to currency risk without foreign assets or liabilities because the exchange rate may affect the profitability of its domestic banking activities. For

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example, the value of a bank loan to an exporter may be considered to make the appreciation of the domestic currency more difficult for the exporter to compete against foreign firms and the likelihood of timely credit reimbursement and resulting profitability for the bank may also be reduced if the appreciation reduces the profitability of that exporter. The determinants of exchange rate may include board size, interest and inflation rates.

2.1.1.2 Interest Rate

The interest rate comprises the amount charged by the bank during lending. This varies with the type of bank and the amount been borrowed (Manyo et al, 2016). The high-interest rate tends to discourage more loans been acquired and can be exploited by the regulatory bodies when they want to either increase or decrease cash in-flow by the deposit money banks. Similarly, the interest rate may also determine the currency values. It is directly proportional to the demand in that increase in demand will tend to increase the value of a currency.

2.1.1.3 Inflation Rate

Inflation is characterised as a steady rise in the overall price level of an economy. This can be called a condition that substantially decreases the value of a currency (Biller, 2007). Inflation is seen as an economic crisis and thus every government guarantees relatively low inflation levels. Market inflation rises or declines have an effect on currency rates. Pugel (2007) indicates a gradual decline in the rate of inflation, with a higher currency inflation, which is generally followed by high interest rates and a depreciation of a country's currency.

2.1.1.4 Bank Size

Bank size plays a part in the way the bank performs and gains domination in the banking sector (Ahmed, Ahmed & Ahmed, 2010). The bigger banks should take advantage of economies of scale to attract more customers and carry out more transactions which result in greater returns. Additionally, the bigger deposit money banks are more trusted by the customers and this implies more clients, the larger banks are in a position to mitigate it and be affected minimally whereas the smaller banks will be highly prone to dissolution and insolvency.

2.1.2 Measurement of Profitability Specific to Banks

2.1.2.1 Return on Assets (ROA)

Khrawish (2011) claims that ROA is critical in explaining the profitability of companies. It is a ratio of revenue to the total asset. It evaluates the management's ability to produce income through the use of company assets. The measurement of the

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company's performance showing to users of financial accounts how well a company uses its assets to produce income is the return on assets. An increased ROA is an indication of greater corporate performance. A growing ROA, for example, may at first seem good, but it is remarkable relative to other firms in the same particular business or the industrial average. The ROA can become biased by the off-balance sheet activities (Flemini et al., 2009).

2.1.2.2 Capital Adequacy Ratio

Capital adequacy provides that the adjusted capital is adequate to absorb losses, fixed assets and surpluses in the current operations and potential growth of the bank (CBN, 2004). A bank has the right amount of capital when it has sufficient funds to reach its business levels in terms of the amount and capital ratios specified, to ensure its activity is secure and to maintain public trust (Rose & Hudgins 2008). The capital of a bank is regarded as sufficient if it is covering the operating costs of the bank, satisfies customers' withdrawal needs and protects depositors in a financial crisis and leads to a lower capital adequacy ratio (Amenawo, Hodo, & Emmanuel, 2016).

2.1.2.3 Return on Equity (ROE)

ROE is described as a metric of the return on the equity investment by shareholders in the company (Portes & Rey, 2005). It tests how efficiently a company makes profit from the capital invested by investors in the company through the buying of stocks.

2.1.2.4 Net Interest Margin (NIM)

NIM is characterised by Gul, Irshad, and Zaman (2011) as the ratio of net interest income to total earnings assets. It represents the difference between the bank's interest income on loans and advances and the interest costs it pays on its borrowed funds. Banks would be more stable and profitable if their net interest margin is higher.

2.2 Theoretical Background

2.2.1 Interest Rate Parity Theory

Monetary policymakers discovered that changes in monetary policy affected exchange rates as early as the gold standard era. The appreciation of the local currency typically follows an increase in the local interest rate, and the depreciation of the local currency usually follows a fall in the local interest rate. This suggests that the price of assets influences the exchange rate's fluctuation. Keynes (1923) introduced the interest rate parity condition, which is now known as interest rate parity, to link the exchange rate, interest rate, and inflation. The theory has two forms: covered interest rate parity (CIRP) and uncovered interest rate parity (UCIRP).

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2.2.1 International Fisher Effect Theory

Irving Fisher (1930) developed a model in his book titled: "The Theory of Interest". Market interest rates is used for explaining why exchange rates change over per rather inflation. The Fisher's effect assumes that interest rate changes balances the changes that occur in exchange rate. The theory argues that possibility of arbitrage opportunities between financial markets which generally occurs in the capital flows equals real interest rates across countries. It equally indicates that a higher interest rate could lead to higher inflation rate, thus decreasing real currency of a country over time. The relative interest rates and foreign exchange rates is explained within the interest rate theory of exchange rate expectations. The international fisher effect is when the interest rates that appreciate currencies are sufficiently low and the depreciating currencies are sufficiently large to offset anticipated currency gains and losses.

2.3 Empirical Review

In its macroeconomic-profitability analysis of commercial banks in China, Pan and Pan (2014) have shown that macroeconomic factors affect the profits of banks significantly. Positive correlations lie between bank profitability, economic growth, inflation, interest rates, and money supply growth. The study did not address the bank's profitability change in the exchange rate. In addition, He, Fayman, and Casey (2014) have been examining the impact on bank profitability of foreign-currency fluctuations using 22 large US commercial banks. In its macroeconomic-profitability analysis of commercial banks in China, Pan and Pan (2014) have shown that macroeconomic factors affect the profits of banks significantly. Positive correlations lie between bank profitability, economic growth, inflation, interest rates, and money supply growth. The study did not address the bank's profitability change in the exchange rate. Moreso, He, Fayman, and Casey (2014) have examined the impact on bank profitability of foreign-currency fluctuations using 22 large US commercial banks. They found that large U.S. banks have exchange risk and particular banking activities that were associated with the dollar's value in relation to other currency market baskets.

The determinant of profitability by bank was found by Osuagwu (2014) to be significant for exchange rate using return on equity and non-interest margin as measures, whereas it is non-significant when measured as return on assets. The determinant of profitability by bank was found by Osuagwu (2014) to be significant for exchange rate using return on equity and non-interest margin as measures, whereas it is non-significant when measured as return on assets.

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Isaac (2015) assessed how exchange rate risk affect the profitability of bank Nigeria for the period 1997 to 2014. The study concluded that changes in exchan rate affect bank's performance negatively. However, the use of one bank to dra conclusion appears restrictive and misleading, hence, the study fills the ga identified.

Carolyn and Daniel (2016) analyzed the impact of foreign exchange rate fluctuation on the financial performance of Nairobian banks from 2006 to 2013. The study measured the bank's financial performance in Kenya using return on capital employed, return on equity, and earnings per share. To evaluate the influence, a regression analysis was performed, and it was concluded that exchange rate has a positive correlation with both ROCE and ROE. The link between EPS and foreign exchange was found to be positive but not significant.

The influence of exchange-rate fluctuations on the output of listed companies was investigated in Nigeria by Harley (2018). The exchange rate was seen to have an effect on investment, and conclusions were drawn that the exchange rate did affect the firm's results. Inflation, government spending, liquidity risk, and degree of transparency have had a negative relationship with return on investment, and a change in the interest rate or inflation rate causes market volatility, which has a negative impact on a company's financial results.

On the basis of corporate profitability evidence from selected quoted congelomerates in Nigeria, Okika et al. (2018) investigated the impact of currency fluctuation. It investigated the variation in the exchange rate on returns on assets and capital. There were two negligible hypotheses tested, and the research maintains that the currency fluctuations have no substantial impact on return on assets and equity return in the Nigerian conglomerates.

Osho (2019) also performed a study of regression using Ordinary Least Square (OLS) to analyse the financial performance of multinational corporations in Nigeria, but not banks. Asset returns, inflation rate, and the interest rate have been reduced by exchange rate. The results showed that fluctuation in exchange rates has a significant impact on multinational business performance. Through foreign trade with the other countries of the world, it showed that exchange rate volatility affects the operations of firms in Nigeria.

Based on the research objectives, and theoretical as well as empirical background, the following null research hypotheses were formulated.

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H_{01}: Exchange rate does not have a significant relationship with the profitability of the deposit money banks listed in the Nigeria.
H_{02}: Inflation rate and the profitability of selected listed deposit money banks in Nigeria are not significantly related.
H_{03}: Interest rate and the profitability of selected listed deposit money banks in Nigeria are not significantly related.
H_{04}: The size of the listed Nigerian banks and their profitability are not significantly related.

3. Data and Methods

This section includes information on the study's model specification, research design, area of study, sample size and population, measurement of variables, data sources, prior expectations as well as estimation techniques.

The research design utilized was the ex-post facto. The secondary data which were already in existence were collected as no attempt is made to control or manipulate the relevant independent variables.

Secondary data were used for this study and was gleaned from the audited banks' annual report which covered a period of ten (10) years from 2009 to 2018. The study area comprises listed Nigerian banks quoted on the Nigerian Stock Exchange. This area was chosen because the Banking Industry is a primary player in global foreign exchange transactions and for its central role in financial intermediation. The study population constitutes of the 22 listed deposit money banks listed on the NSE as of 31st February 2020. The sample size of this study was determined purposively. Seven (7) banks were selected from the eight (8) banks with international licenses; the 8th bank was not included in the sample as a result of the recent merger that took place with the bank (Access/Diamond merger). These banks were purposively selected considering that they have not gone through any major merger or acquisition that could affect significantly the result of the study. The banks selected are First Bank (FBN), Guarantee Trust Bank, Zenith Bank, Union Bank, United Bank for Africa, First City Monument Bank (FCMB), and Fidelity Bank.

The data for this study were collected from secondary sources. Data for profitability measures and bank size were extracted from the company's audited annual reports and accounts from 2009 to 2018, while data for the exchange, interest, and inflation rates were gotten from the central bank of Nigeria bulletin publications.

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Model Specification

Lagat and Daniel (2016) multiple regression models were adopted;

$$ROCE = (ER_{it}, \mu) \quad \text{.....Eq. 3.1}$$
$$ROE = (ER_{it}, \mu) \quad \text{.....Eq. 3.2}$$
$$EPS = (ER_{it}, \mu) \quad \text{.....Eq. 3.3}$$

Where ER symbolizes Exchange Rate; ROCE signifies Return on Capital Employed; ROE signifies Return on Equity. EPS signifies Earnings Per Share and represents an error term.

The model specification of Lagat and Daniel (2016) was adopted and adapted with necessary modifications to suit this study. The functional model is:

$$PROF_{(ROA, CAR, ROE, NIM)} = \int (FER_{it}, \mu) \quad \text{.....Eq. 3.4}$$

The model in its econometric form is specified below:

$$PROF_{i(ROA, CAR, ROE, NIM)} = \beta_0 + \beta_1 FER_{it} + \beta_2 INF_{it} + \beta_3 INT_{it} + \beta_4 SIZE_{it} + \mu \text{ .. Eq. 3.5}$$

To obtain empirical evidence, descriptive, correlation, regression analysis, and robustness tests were used with the statistical aids of E-view 9. The descriptive analysis was adopted and Pearson correlation analysis was used to ascertain the dependent-independent variables relatioships as well as the control variables. The multiple linear regression (OLS estimator) which is used to evaluate the differences in the observed values of the variables though panel regression analysis can also be used. But multiple linear regression gives a better and robust output. Furthermore, robustness tests (multicollinearity, autocorrelation, and heteroscedasticity) were carried out to determine appropriate regression results to make reliable decisions.

4. Data Analysis and Discussion of Findings

A summary of the variables employed in the study is shown in Table 1. The mean, maximum, minimum, for ROA are 2.48867, 22.6519, -9.86521, respectively. The mean value suggests on average, the selected DMBs are earning a return of 2.5% on every one naira (₦1) invested on the assets they controlled. The maximum value shows that the highest capacity of the banks in generating revenue from their assets is at 22.7%. While the minimum value of -9.9%, shows the bank with the poorest ability to generating commensurate revenue from its assets. The summary statistics for ROA are significant as the P-value is less than 10%, 5%, and 1% levels of significance. The summary statistics for the Foreign exchange rate are significant while, summary statistics of the Inflation rate, Interest rate, and Bank size are insignificant as the P-values are higher than 10%, 5%, and 1% levels of significance.

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Table 1: Summary of Descriptive Statistics

	ROA	CAR	ROE	NIM	FER	INF	INT	SIZE
Mean	2.48867	20.16571	9.07188	5.01626	198.43	11.816	8.407	6.91275
Median	1.94022	19.99	9.43513	4.73219	158.05	11.815	8.195	6.34096
Maximum	22.6519	35	86.8442	55.5586	306.1	16.52	11.06	9.52519
Minimum	-9.86521	0	-133.695	0	148.9	8.06	6.03	2.94768

Source: Authors' Computation, 2020

Correlation Analysis

Table 2: Correlation Matrix

	ROA	CAR	ROE	NIM	FER	INF	INT	SIZE
ROA	1	0.01282	0.60231	0.32449	0.0809	0.01798	0.09289	0.08541
CAR		1	-0.0228	-0.0877	0.10255	0.17091	0.08325	0.10917
ROE			1	0.04687	0.06095	0.03822	0.19	0.22076
NIM				1	0.03544	0.16959	0.08229	-0.0004
FER					1	0.59295	-0.2005	-0.0049
INF						1	0.26529	0.04366
INT							1	0.02579
SIZE								1

Source: Author's Computation, 2020

Table 2 shows the relationships that exist in the variables and it reveals that return on assets and foreign exchange rate (8%) are positively related. Interest rate (9.3%) and bank size (8.5%). Inflation Rate (1.8%). This relationship implies that a unit increment in these variables will increase the ROA of banks. In order words, when there's a naira increase in the FER, a percentage change in Inflation and Interest rates; and a unit increase in the value of the bank's size, it would result in increasing profitability of the DMBs measured by the ROA.

Meanwhile, the positive relationship seen to exist between these variables and deposit money banks' profitability validates a *priori* expectation for associations between the variables with the Net Interest Margin of Bank Size. The Table revealed no relationship between NIM and bank size.

Table 3 reveals that FER volatility has impact on ROA of Nigerian DMBs. An rise in exchange rate would increase the return on assets by 6.52 percent. However, this positive effect is insignificant as the *p*-value (0.3403) is greater than the 10%, 5%, and 1% levels of significance. Inflation Rate (INF) has an insignificant negative effect on selected Nigerian banks' return on assets (p-value = 0.3959 > 0.1, 0.05, 0.01). A 21 percent reduction in the ROA resulting from a unit rise in the rate of inflation. The

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ROA of selected deposit banks in Nigeria has an insignificant impact on the interest rate (INT). = 0.2230 > 0.1, 0.05 0.01. A unit rate rise would increase the return on assets by 46 percent. Bank size (SIZE) has a negative insignificant impact on the selected banks in Nigeria (P-value = 0.8910 > 0.1, 0.05, 0.01). A unit increase in the value of bank size will result in an 11% decrease in the Return on Assets.

Table 3: Regression Results - ROA TAKING FER AS A LOG (FER)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.02524	13.54921	-0.961328	0.3403
FER	6.520843	5.285679	1.233681	0.2222
INF	-0.206979	0.242028	-0.855185	0.3959
INT	0.460980	0.375944	1.226194	0.2250
SIZE	-0.112469	0.816806	-0.137694	0.8910
R-squared	0.618701	Mean dependent var		2.488669
Adjusted R-squared	0.595272	S.D. dependent var		3.875916
S.E. of regression	3.934909	Akaike info criterion		5.720980
Sum squared resid	913.5270	Schwarz criterion		6.074315
Log-likelihood	-189.2343	Hannan-Quinn criteria.		5.861329
F-statistic	8.694660	Durbin-Watson stat		2.854183
Prob(F-statistic)	0.010796			

Source: Authors' Computation, 2020

$ROA = -13.0252 + 6.5208FER - 0.2070INF + 0.4610INT - 0.1125SIZE$

The F-statistic of 8.694660 with the associated p-value of 0.010796 indicates that FER, INF, INT, and SIZE have a joint statistically impact on ROA of the DMBs in Nigeria at 5% and 10% level of significance. This shows that the overall fitness of goodness is satisfactorily fitted. The adjusted coefficient of determination (adjusted R2) shows 0.595272. The implication is that 60% variation in the ROA of the selected DMBs are jointly explained by the explanatory and control variables, while the remaining 40% is accounted by factors not captured in the study.

The effects of FER on Nigerian banks' CAR are shown in Table 4. A unit rate rise would increase the capital adequacy rate by 78.81 percent. This positive impact is nevertheless negligible since the *p*-value (0.7674) exceeds the 10%, 5%, and 1% of importance.

The results of the model assessment indicate that the inflation rate (INF) is insignificantly positive in Nigeria's capital adequacy ratio (p-value=0.4402 >0.1, 0.05, 0.01). A unit adjustment in the rate of inflation causes the capital adequacy rate to change by 9.4 percent.

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Table 4: Regression Results: CAR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-145.8831	679.7301	-0.214619	0.8308
FER	78.80813	265.1692	0.297199	0.7674
INF	9.436193	12.14194	0.777157	0.4402
INT	8.337450	18.86017	0.442066	0.6601
SIZE	-24.84696	40.97711	-0.606362	0.5466
R-squared	0.587258	Mean dependent var		43.55800
Adjusted R-squared	0.561964	S.D. dependent var		195.3960
S.E. of regression	197.4045	Akaike info criterion		13.55171
Sum squared resid	2299.144	Schwarz criterion		13.90505
Log-likelihood	-463.3100	Hannan-Quinn criteria.		13.69206
F-statistic	4.860302	Durbin-Watson stat		2.479069
Prob(F-statistic)	0.047265			

Source: Author's Computation, 2020

ROA = -145.8831 + 78.8081FER + 9043621NF + 8.3375INT - 24.8470SIZE

The model estimation result also shows that INT has an insignificant effect on CAR of Banks in Nigeria. (p-value = 0.6601 > 0.1, 0.05, 0.01). A unit increase in the interest rate will result in an 8.3% increase in the Return on Assets.

The model estimation result shows that Bank Size (SIZE) affects the capital adequacy ratio of selected deposit money banks in Nigeria negatively. However, the effect is not significant (p-value = 0.5466 > 0.1, 0.05, 0.01). The Capital Adequacy rate would decrease by 25 percent due to a unit shift in bank size. A shift in bank size would reduce capital adequacy by 25 percent.

ROA = -99.3444 + 38.5343FER – 1.2855INF + 4.2293INT + 0.0328SIZE

Table 5: Regression Results: ROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-99.34441	74.10686	-1.340556	0.1852
FER	38.53432	28.90980	1.332915	0.1877
INF	-1.285480	1.323762	-0.971081	0.3355
INT	4.229277	2.056211	2.056831	0.0441
SIZE	0.032818	4.467487	0.007346	0.9942
R-squared	0.728545	Mean dependent var		9.071879
Adjusted R-squared	0.711889	S.D. dependent var		22.65818
S.E. of regression	21.52182	Akaike info criterion		9.119340
Sum squared resid	27328.13	Schwarz criterion		9.472674
Log-likelihood	-308.1769	Hannan-Quinn criter.		9.259688
F-statistic	5.747882	Durbin-Watson stat		2.793631
Prob(F-statistic)	0.031146			

Source: Authors' Computation, 2020

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Table 5 shows the positive effect of FER on Nigerian banks' return on their equity (ROE). A unit rate rise would increase the return on equities by 38.53 percent.. This positive impact, however, is negligible since the p-value (0.1877) is smaller than that of 10%, 5% and 1%. The inflation rate (INF) has a small negative influence on the return on Nigerian banks' equity. (p-value = 0.3355> 0.1, 0.05, 0.01). (p-value) An inflation rate unit rise will result in a 1.3% decrease in Equity Return. The INT has a substantial positive impact on the Equity Return (ER) of banks in Nigeria. (p-value = 0.0441 < 0.1, 0.05). A unit interest rate rise would lead to an increase in the return on assets of 8.3%. Bank size (SIZE) has a negative impact on Nigerian banks' return on equities. (p-value = 0.9942> 0.1, 0.05, and 0.1). An rise in the bank size value in units would reduce the return on equity by 0.03 percent.

ROA = -0.1671 - 3.2476FER + 0.455INF + 0.0617INT + 0.919SIZE

Table 6: Regression Results: NIM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.167108	21.56011	0.007751	0.9938
FER	-3.247617	8.410806	-0.386124	0.7008
INF	0.455207	0.385126	1.181971	0.2420
INT	0.061739	0.598219	0.103204	0.9182
SIZE	0.919026	1.299738	0.707086	0.4823
R-squared	0.608178	Mean dependent var		5.016258
Adjusted R-squared	0.584171	S.D. dependent var		6.506678
S.E. of regression	6.261401	Akaike info criterion		6.650013
Sum squared resid	2313.103	Schwarz criterion		7.003348
Log likelihood	-221.7505	Hannan-Quinn criter.		6.790362
F-statistic	1.551174	Durbin-Watson stat		2.412677
Prob(F-statistic)	0.084446			

Source: Authors' Computation, 2020

The effect of FER on NIM by banks in Nigeria is revealed in Table 6. An rise in the exchange rate by unit would reduce the NIM by 3.25%. However, the p-value (0.7008) is higher than 10%, 5% and 1% of the significance. This negative effect is non-significant.

The model estimate shows an insignificant positive impact of the inflation rate on Nigerian banks net interest margin (p value > 0.1, 0.05, 0.01). (p-value = 0.2420). A unit rise of the rate of inflation leads to a net interest margin increase of 0.46%. The Net Interest Margin (NIM) of banks in Nigeria has an insignificant positive impact. (p-value = 0.9182 > 0.1). The unit rate rise would increase the return on assets by 0.062 percent. Bank size (SIZE) has a sizeable positive impact on Nigerian banks' Net

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Interest Margin (NIM), (p-value = 0.4823 > 0.0, 0.05, and 0.01); A unit increase in the bank size value would lead to a net interest margin increase of 0.1 per cent.

Discussion of Findings

DMBs were evaluated between the reporting periods of 2009 and 2018 in Nigeria based on the impact of the foreign exchange rate fluctuations on profitability. The results demonstrate that the Return on Assets, the Return on Equity, the Return on Equity and the Net Interest Margin of the chosen DMBs do not have any impact on profitability over the time span. The only exception is the impact on the profitability of selected ROE estimated DMBs of the interest rate.

This means that shifts in the currency exchange rate over the years do not affect the DMBs' profitability substantially. While the study identified different degrees of influence, these effects were not statistically significant. The rentability measures used in this analysis were consistent with this results. Osundina, Ademola and Olayinka (2016) working on exchange-rate volatility for the output of Nigerian banks, found that fluctuation in exchange rates affected the profitability of banks with the use of ROA in the calculation, while currency variation had a major negative impact on the liquidity of banks with the use of LDR as a measure. The impacts of currency fluctuation on the firm profitability of the conglomerate in Nigeria were analysed by Udeh, Udeh, Francis and Okoye (2018) and the effects of ROCE and ROA were examined by FER. The results verified the insignificance of the two hypotheses examined.

Carolyn and Daniel (2016) conducted a study to determine the relationship and implications of FER fluctuation on commercial banks listed on the Kenya Securities Exchange in Nairobi. The financial output of the banks is measured by ROCE, ROE and EPS. The findings have shown that FER has an impact but important effect upon the financial efficiency, e.g. ROCE, ROE and EPS, on this calculation of profitability. There was also an insignificance to the control variables. Kiganda (2014), Pancras Onyango (2015), Micco, Panizza & Yañez, are additional studies supporting this finding (2007). Rao & Lakew and Ongore et al. (2012), and (2013).

This finding is not consistent, however, with Obidike, Ejeh and Ugwuegbe' (2015) a prior expectations and findings, who found that FER has an impact on Nigerian banks' results. They also found that interest rates had a substantial impact on the banks' financial results. A bank's performance was measured using the changes in the total assets of the banks which cannot be said to be an effective profitability measurement as many several factors can be responsible for the changes in total

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assets other than profitability. Other studies supporting this result include; Babazadeh & Farrokhnejad (2012), Tadasse Getachew (2015), Lambe (2015), He, Fayman and Casey (2014), Otuori (2013), and Mohammad and Farshid (2012), Mohan and Enyew (2019), Wagdi and Bektaş (2018).

Various factors may be attributable to a discrepancy in the findings and other researches which has found a significant exchange rate impact on profitability for banks. It is noted that local studies in this area have also found insignificant effects of forex on bank profitability. Other factors include the uniqueness of reporting environment in Nigeria, (other countries outside Africa considered in the literature revealed more of a significant effect than insignificant effect), Sample Size, and methodology adopted by different researchers. A more skeptical reason which is open for investigation is the reliability of data obtained from the annual statements of the DMBs (although being audited, it is expected that they should be reliable).

1. Conclusion and Recommendations

The study ascertained that FER is useful in determining the profitability of banks, especially those involved in international operations. It shows that irrespective of the measurement used for profitability, the effect of FER remains the same but in various degrees of impact.

The following recommendations were made:

1. It is recommended that a sound foreign exchange rate policy should be instituted internally by the management of banks, as effective measures of managing exchange rate risk. Such measures could include but are not limited to denominating their assets in currencies or economies with low volatility of exchange, or at least hedged their asset investment against adverse movements in foreign exchange.
2. The study equally suggests that relevant regulatory authorities should focuses on macroeconomic stability-inflation rate which will guarantee a more stable economic environment and in turn encourage the performance and profitability of deposit money banks, thus policies such as monetary and fiscal policies should be constantly revised to reduce any rate of occurrence of periods of unhealthy inflations.
3. The interest rates of the Nigerian economy (Influenced by the Exchange rate regime upheld by the Federal Government) affects the profitability of the banks; especially the Net Interest Margin capacities of banks and should be routinely examined by the policymakers to ensure they comply and are favorable with current economic demands and events, especially since the exchange rate is affected by several global phenomena.

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4. Banks are should invest more into growing their bank size (Total Assets) by increase in their Total asset as this contributes to increase performance and profitability after a deliberate effort have been taken to identify the specific type of foreign exchange risk they are exposed to and quantification of the impact of such risk. This would help assure equity investors confidence in the stability of the banks in securing their investment in the assets of the banks.

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