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The Effect of Exchange Rate Volatility on the Performance of Deposit Money Bank in Nigeria

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Abstract

As a financial intermediary, deposits money banks are more exposed to the effect of exchange rate. Exchange rate can affect banks corporate performance both directly or indirectly. The direct effect is easy to identify and can be easily be managed. However, the indirect effect of exchange rate on the performance of deposits money banks is very subtle. Basically, it evolves from the impact of exchange rate volatility on the business of banks' customers (depositors) and the economy in general. Therefore, it must be noted that, having a concrete knowledge about the aggregate effect of exchange rate volatility on the profitability and size of banks (performance), serves as a very crucial tool towards to devising an appropriate copping strategy in finding long lasting solution to the problems exerted by the volatility. Thus, through an impulse response analysis, an examination methodology called cholesky one standard innovation, this study, has therefore examined the empirical effect and future dynamic interactions, of exchange volatility on the corporate performance of deposit money banks in Nigeria using a time serial data set of Nigeria global bank, as a sample focus over the period of 1986-2021. This impulse response function was generated from the estimated vector error correction model (VECM). Furthermore, this study tried to determine the level of exchange rate volatility in Nigeria using the generalized auto regression conditional heteroscedasticity (GARCH 1, 1) model. The empirical findings of this study suggest that exchange rate statistically significant negative impact on the banks profitability variables included as control variables in the vector auto regression (VAR) analysis, total deposits (TDPO) and gross domestic products (GDP) growth are found to have significant positive impact on bank profitability and bank size in Nigeria. This study recommends therefore, that bank managers and governing body should focus on the composition effect of exchange rate variation on deposit money banks' profitability and size and make sure to avail appropriate strategy to reduce it adverse effect on the profitability of their bank.

Background to the Study

Exchange rates plays an increasingly significant role in any economy as it directly affects domestic price level, profitability of traded goods and services, allocation of resources and investment decision. Numerous countries of the world especially Nigeria, have witnessed foreign exchange reforms culminating to currency over-valuation and under-valuation due to currency differentials among nations. Ani, Ugwuta and Okanya (2013) affirms that the supply of foreign exchange in Nigeria comes in various ways, and the various circumstances tasks the dexterity and financial ability of the nations' financial managers to achieve efficiency in foreign exchange management and thus further the frontiers of the nation's economy. As such foreign exchange market reforms have always impacted in the overall reform pattern of the financial sector in Nigeria, as a result of the fact that the stability of the exchange rate is a formidable bedrock of all economic activities (Taiwo and Adesola 2013).

As international trade has experienced a tremendous growth in recent decades, international commercial transaction has also undergone great changes, and foreign exchange income has been considered as one of the prominent economic plans in different countries. For exchange rate arrangements, the motives for stabilizing exchange rates fall into roughly two broad categories: (1) concerns about the shorty-term on macroeconomic and financial stability: and (2) concerns about the medium- to long term impact on resource allocation. A particular concern is that exchange rate volatility will encourage speculative behaviour on the maturity structure and currency denomination of assets and liability in the economy, sharp exchange rate movements could result in liquidity shortages and trigger significant balance sheet effects, which may require central bank action to stabilize the system – for instance, by providing the short-term foreign currency liquidity to the banks.

The position of deposits money bank, as commercial brokers in the financial transaction is very significant, so recognizing the situation of financial markets and getting precise, in-time information on the changes in the foreign exchange would result in the profit of financial institution and in turn their countries. As a profit would be the main aim of the profit-making institutions, including banks, bankers, and bank managers are required to have a full understanding of the concept of bank profit in their foreign exchange operations and income, contribution them to know how much risk they can take in their foreign exchange operations to ensure maximum profitability for their stakeholders.

For Ngerebo and Ibe (2013), exchange rate is the ratio between a unit of one currency and the amount of another currency for which that unit can be exchanged at a particular time. Also, exchange rate can either appreciate of depreciate. Appreciation in the exchange rate occurs if less unit of domestic currency exchange for a unit of foreign currency while depreciation in exchange rare occurs if more unit of domestic currency exchanges for a unit of foreign currency.

Exchange rate is one of the economic indicators which directly affect investment as such its role in the overall economic objectives of a country cannot be underestimated. This gives confidence to why the public sectors, foreign investors and private individual pay a lot of attention to the exchange rate volatility. The exchange rate is among the most watched, analyzed and government manipulated macroeconomic indicators. Since September 1986, when the market determined exchange rate has system was introduced via the second-tier foreign exchange market, the naira exchange rate has exhibited the features of continuous depreciation and instability due to exchange rate volatility. This instability and continued depreciation of the naira in the foreign exchange market has resulted in declines in the investment, standard of living of the populace, increase cost of production which also led to cost push inflation. It has also tended to undermine the international competitiveness of non-oil exports and make planning and projections difficult at both micro and macro levels of the economy.

However, it must be noted that Nigeria, being a country that operates an open economy as a result of her natural endowments, encourages increased operational activities in the foreign exchange market. These activities determine the attractiveness of the country's currency and the level of economic development. All transactions done in the foreign market significantly forms a very vital aspect of the activities of financial sectors, intrinsically, the allocation of economy resources. The impact of deposit money banks in this wise, therefore cannot be over emphasized (Ongore and Kusa, 2013).

Exchange by the private sector were made possible by commercial banks which maintain balances abroad and acted as agents for both importers and exporters. This made possible because Nigeria pound sterling (the then national currency) can easily be converted into another country's currency being valued at par with that of the British pound sterling. The non-existence of a viable regulatory institution as well as effective regulatory framework for foreign exchange transaction actually hindered the early development of an active foreign exchange market in Nigeria but with the establishment of the central bank of Nigeria (CBN) in 1958 with sole authority in foreign exchange management, the need to develop a domestic foreign exchange market came to being (CBN, 2013).

Deposit money banks play a critical role in economy development of countries. They channel funds from depositors to investors through their financial intermediation role. Beyond the intermediation function, the corporate performance of banks also has critical implications for economic growth of countries. Good financial as well as corporate performance of the banks rewards the shareholders for their investment. This, in turn, encourages additional investment and brings about economic growth. In order to provide a sustainable intermediation service in the economy and reasonable reward for the shareholders, banks need to be profitable. They can do so, if they generate necessary income to cover their operation cos. On the other hand, poor banking performance can lead to banking failure and crisis which have negative repercussion on the economic growth (ongore and kusa, 2013).

Statement of the Problem

Extant research has documented the adverse costs of exchange rate volatility on various parts of the domestic economy. Still lacking is conclusive validation of how changes in exchange rate affect corporate performances apart from linking this evidence to specific firms (Port Harcourt and poncet, 2012). In his study, Demir (2013). Found that exchange rate volatility has a significant growth reducing effect on manufacturing firms. Similarly, Musyoki (2012) found a negative relationship between exchange rate volatility and economic growth in Kenya. Also, khosa (2015), result showed that exchange rate volatility had a significant negative effect on the performance of exports, regardless of the measure of volatility used.

Rao and Lakew, 2012; Ongore (2013), Kiganda, 2014 concluded that exchange rate, a determinant of macro-economic variable has an insignificant effect on banks corporate performance. However, Elyasiani and Mansur (2005) further studied the impact of exchange rate information on Japanese bank stocks and arrived at conflicting results. On the contrary, the result differed with that of Oyango (2014), who found that exchange rate volatility positively impacts on economic growth but is not significant relationship, such that it does not have significant effect on the performance of firms.

Existing literature shows contrasting conclusions as some scholars found a positive effect while others a negative significance effect in the nexus. This means that there is actually a deficiency of steady evidence specifically in the banking industry, on the topic of exchange rate volatility and corporate performance. Since the exchange rate fluctuations affects profitability and investment decisions in firms, especially by increasing risk and uncertainty, it means that the banking industry in Nigeria is also part of the firms experiencing the diverse resultant effects of the fluctuations in the currency exchange Ongore, V.O and Kusa G.B (2013). Whilst the reports have been showing an increasing trend in insurance firms' profits for the last decade, they do not clearly indicate it tiie volatility ot exchange rates has contributed to these profits.

The studies that informed this research, therefore, necessitates the urge to fill the knowledge gap and establish, through empirical analysis the relationship between foreign exchange rate volatility and the corporate performance of Deposit money banks Listed on the Nigerian stock exchange.

Research Questions

At the end of this study, answers to the questions listed below is adequately justified:

1. What is the effect of exchange rate volatility on the performance of deposit money banks in Nigeria?
2. How does exchange rate volatility affect the profitability deposit money banks in Nigeria?
3. What is the casual relationship between exchange rate volatility and deposit money banks performance?

Objectives of the Study

The major objective of this study is to examine the effect of exchange rate volatility on the performance of deposit money banks in Nigeria. Other specific objectives are to;

1. Examine the level of exchange rate volatility in Nigeria
2. Investigate the impact of exchange rate volatility on the profitability of deposit money banks in Nigeria
3. Determine the casual relationship between exchange rate volatility and deposit money banks performance.

Research Hypotheses

H1: There is low level of exchange rate volatility in Nigeria

H2: Exchange rate volatility has no significant impact on Nigerian deposits money banks' profitability.

H3: There is no causal relationship between exchange rate volatility and deposit money banks performance.

Significance of the Study

This study contributes to the literature on foreign exchange volatility, efficiency of foreign exchange market in Nigeria in relation to the Nigerian banking industry, specifically the deposit money banks. Finance and economics researchers will deem the study useful in guiding further research. This study will be valuable to practitioners as it will help them better understand the dynamics of changes in exchange rate and the implications on corporate performance. Practitioners will be able to identify research gaps and recommendations for further study of exchange rate volatility influence across other sectors of the economy.

Conceptual Review

Exchange rate volatility often results due to speculation and mismatches in foreign exchange exposure. Exchange rate volatility according to Spiro (1980) refers to the sensitivity of a bank market value to unanticipated exchange rate movements. Consequently, exchange rate movement is estimated by the regression, coefficient describing the market value of the bank. This explains why export-oriented firms' use of currency hedging derivative will depend on the management's familiarity with derivative product and the existence of substantial fixed cost required in developing and managing a currency hedging programmed.

In the views of Mordi (2006), the existence of many parallel market side by side with the officially recognized institutions, are usually responsible for the rise in exchange rate misalignment, most especially in developing countries. Madura (1989) posits that the exchange rate risk caused by exchange rate volatility relates to the effect of unexpected exchange rate changes on the value of the bank. In particular, it is explained as the possible direct loss coming as a result of an unhinged exposure or indirect loss in the firm's cash flows, cash flows, assets and liabilities, net profit and stock market value from an exchange rate move. The efforts of banks to eliminate and correct such risks in the

exchange rate inherent in their operations, requires the determination of the specific type of current risk exposure, the hedging strategy and the available instruments to deal with their currency risks.

Exchange Rate Volatility

Exchange Rate refers to the price paid in one currency to acquire the one unit of foreign currency or the foreign currency received to sell one unit of home currency. There are many factors that determine the currency exchange rate, which are basically the macroeconomic factors. A currency can depreciate or appreciate against other currency largely due the changes in these economic factors. The exchange rate of countries can be determined either by the country's monetary authority and/or supply and demand depending on the exchange rate regime the country peruses (Jeffrey 2008). The exchange rate is the price of a unit of foreign currency in terms of the domestic currency (Nydahl, 1999). Exchange rate serves as the basic link between the local and the international market for various goods, services and financial assets (Reid and Joshua, 2004).

Volatility on the other hand is a measure of risk, usually simply referred to as "instability, fickleness or uncertainty". The Exchange rate volatility measures the degree to which the exchange rate fluctuates or varies over a period of time. Exchange rate is said to be more volatile if there are more frequent ups and downs or less volatile if there are lesser changes in it over a period of time. There is a real time fluctuation in floating exchange rate (Sabri, 2011). According to Mulwa (2013), volatility of exchange rates describes uncertainty in international transactions both in goods and in financial assets. Foreign exchanges rates help fill the domestic revenue-generation gap in a developing economy (Cote, 2005).

Ilhan (2006) referred exchange rate volatility to as unforeseen variations in exchange rate and the risk thereof. That is, exchange rate volatility refers to the tendency for foreign currencies to appreciate or depreciate in value, thus affecting the profitability of foreign exchange trades. He further postulates that econometrics considered sources of exchange rate volatility namely balance of payments, inflation, and interest rate has increasingly exhibited fluctuation tendencies. Such volatility affects both the cash flow of a firm's operations and the value of a firm (Farah, 2013). Theoretically, changes in exchange rate significantly results in economic uncertainty that can cause a direct change in stock prices (Ngerebo, 2012). There are many circumstances when exchange rate volatility comes into play, including business dealings between parties in two different countries and international investments. Although this volatility is difficult to avoid in such circumstances, the use of futures to lock in exchange rates can mitigate the effects of price change.

Determinants of Exchange Rate Volatility

This includes Money supply, Balance of Payments, Foreign Exchange reserves and Interest rate differentials amongst others (Otuori 2013).

1. **Money Supply**

Johnson (1972) stated that a country's balance of payment is dependent on monetary

demand and supply in that country as well as the in other countries worldwide. Monetary demands increase without a similar increase in the source element will result in exchange rate appreciation (Frenkel and Johnson, 2013). Wilson (2009) supported the concept that increase in money supply will result in a decrease in ratio of currency when he studied effective exchange rate between the USD and weighted average trade patterns in Africa. He further argued that money supply was an aggregate determinant of behavior of exchange rate in African financial markets, Nigeria is a good example.

2. Interest Rates

One important controversial variable is the interest rate. Higher interest rates attract foreign capital inflows and appreciates a country's currency and the reverse is true (Juthatip, 2009). Fernandez (2002) opined that an increase in the interest differential between Euro area and abroad significantly appreciated the Euro. Danga and Kiptui (2016) in their study on determinants of exchange rate volatility opined that deposit money banks generate a lot of attention because of the lending rates attached to their loan approvals. Moreover, considering the recent focus shift by banks over the passing of the Banking Bill seeking to control lending interest rates by commercial banks, banks have converged to develop strategies on curbing the effect of this move.

3. Inflation Rates

As a general rule, a country with a consistently lower inflation rate exhibits a rising currency value, as its purchasing power increases relative to other currencies. During the last half of the twentieth century, the countries with low inflation included Japan, Germany and Switzerland, while the U.S. and Canada achieved low inflation only later. Those countries with higher inflation typically see depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates (Bergen, 2010).

4. External Debt

According to Bergen (2010) countries will engage in large-scale deficit financing to pay for public sector projects and governmental funding. While such activity stimulates the domestic economy, nations with large public deficits and debts are less attractive to foreign investors. This is because a large debt encourages inflation, and if inflation is high, the debt was serviced and ultimately paid off with cheaper real dollars in the future.

5. Exports and Imports

According to Solnik (2000), the balance of payments approach was the first approach for economic modeling of the exchange rate. The balance of payments approach tracks all of the financial flows across a country's borders during a given period. All financial transactions are treated as a credit and the final balance must be zero. Types of international transactions include: international trade, payment for service, income received, foreign direct investment, portfolio investments, short- and long-term capital flows, and the sale of currency reserves by the central bank.

A ratio comparing export prices to import prices, the terms of trade is related to current accounts and the balance of payments. If the price of a country's exports rises by a greater rate than that of its imports, its terms of trade have favorably improved. Increasing terms of trade, shows greater demand for the country's exports. This, in turn, results in rising revenues from exports, which provides increased demand for the country's currency (and an increase in the currency's value). If the price of exports rises by a smaller rate than that of its imports, the currency's value will decrease in relation to its trading partners (Solnik, 2000).

Exchange Rates Volatility in Nigeria

A country must be able to know the quantity of her currency that will be needed to pay for goods and services demanded from other countries and the medium to determine this is called an exchange rate.

According to O'Sullivan (2003), exchange rate is the value of a nation's currency in terms of another nation's currency that is, it is the required number of units a currency can buy for a certain number of units of another currency. In Nigeria, it is the value of Naira in relation to other currencies such as United States Dollar, Japanese Yen, and British Pounds and so on. Exchange rate in Nigeria has changed over the years from regulated to deregulated regime. Ewa (2012) asserts the fact that the exchange rate of the naira was relatively stable between 1973 and 1979 during the oil boom era and when agricultural products accounted for more than 70% of the nation's gross domestic products (GDP). In 1986 when Federal government adopted Structural Adjustment Policy (SAP) the country moved from a peg regime to a flexible exchange rate regime. Exchange rate was solely determined by market forces instead of the prevailing system whereby monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives. (Mordi, 2006).

Over the years, the naira exchange rates have been fluctuating in relation to major international currencies due to several factors including manipulative operations of banks and changes in the policies of the government. These policies are usually targeted at protecting the foreign exchange values, preserving the external reserves, maintaining favourable balance of payment and financial equilibrium (Ngerebo, 2012). The naira exchange rate is not fixed, it is however subject to variations; therefore, floating exchange rate tends to be more volatile. Omojimite and Akpokodje (2012) emphasize that despite the efforts of the government to maintain a stable exchange rate in the last two decades, the naira depreciates in relative to American dollars. For example, the naira depreciated from NO.61 in 4981 to N2.02 in 1986 and further to N8.03 in 1990. Although the exchange rate became relatively stable in the mid-1990s, it depreciated further to N120.97, N129.36 and N133.50 in 2002, 2003 and 2004 respectively (Obadan, 2006). Thereafter, the exchange rate appreciated to N132.15, N128.65, N125.83 and N118.57 in 2005, 2006, 2007 and 2008 respectively and further depreciated to N148.88, N150.30, N153.86, N157.50, N157.31, N158.55 and N200 in 2009, 2010, 2011, 2013, 2014 and 2015 respectively. Currently, as at the year of this research, 2018 the dollar has further appreciated to N305.79 from N310 in 2016. (CBN, OCTOBER 2016).

The major problems of exchange rate volatility in Nigeria as identified by Dwivedi (2002) includes; Balance of Payment deficit (that is more goods and services being imported than exported); Also a currency will tend to lose value, relative to other currencies, if the country's level of inflation is relatively higher, if the country's level of output is expected to decline, or if a country is troubled by political uncertainty; Speculative selling can also cause prices to fall below „true value" in a similar fashion; and finally the higher the interest rates of a country, the greater the demand for that currency. Some of the factors driving exchange rate movement in Nigeria include; GDP growth rate, macro-economic shocks, Balance of Payment position, external reserves, interest rate movements, external debt position and speculation contagion. Aliyu (2009) explained further that the problems of instability are not unknown to government; as a result, policies (monetary, fiscal, income and trade) were formulated over time.

Study further reviewed empirical studies done both from international and local perspectives. The empirical studies (for example; Todani and Munyama (2005), Addael, Nyarko-Baasil and Tetteh (2014), Adam (2012), Sekmen (2011), Wong, Wong and Leung (2008), He et al. (2014), Merikas (1999) , Babazadeh and Farrokhnejad (2012), Rao and Lakew (2012), Allayanmis, Hrigs, and Weston, (2001), Barton, Shenkir, and walker, 2002, Paparioannon(2001), Saunders and Swary (1986), Allen (2003), Izard, (2007), and Mauta (1999)) were done on international setting in countries whose findings may not apply to the Nigerian financial system. However, the Studies done in Nigeria (for example; Obadan (2009), Adebiyi (2009), Olugbenga (2012), Taiwo and Adesola (2013). Osuagwu (2014). Agu (2012), Owoeye (2013), Opaluwa, Umeh and Ameh (2010), Ojo and Alege (2014), Owoeye, and Ogunmakin (2013), and Adetayo (2013) did not wholesomely focus on the corporate performance of deposit money banks, indicating therefore, a gap to fill.

Gap to Fill

Empirically, according to their studies (Rao and Lakew, 2012), Kanwal and Nadeem (2013); Pan and Pan (2014), Ongore and Kusa (2013), Kiganda (2014) and some banking literature, the corporate performance of deposit money banks can be influenced by different factors. The performance of banks can be affected by internal and external factors which can be classified into bank specific (internal) and macroeconomic variables (Ongore and Kusa, 2013). The internal factors are the individual bank characteristics that affect the profitability of banks and these factors are basically influenced by the decision of management and board. The external factors are a sector wide or country wide factors, which are beyond the control of the company.

Generally, the bank specific factors may relate to a bank's overall managerial practices on different operational aspects of the bank while the external factors are related to the industry and macroeconomic variables; within which the bank operates. Exchange rate is one of the macroeconomic variables that could influence banks corporate performance; it may affect individual banks directly and/or indirectly. It directly affects the banks through the structure of assets and liabilities denominated in foreign currency, off balance sheet exposure, and non-asset-based services (Martin and Mauer, 2003). When

assets and liabilities are invoiced in foreign currency, exchange rate variations directly affect the values of the assets and the liabilities in terms of domestic currency, through recognition of gain or loss. If the amount of foreign currency assets and liabilities are the same, there is no direct effect of the exchange rate variation on the bank's balance sheet and income statement. The direct effect occurs when the banks do not hold the same amount of foreign currency assets and foreign currency liabilities.

The indirect effects of the exchange rate on the banks performance can be channeled through its effect on the demand for loans, the extent of competition, and other aspects of banking conditions (Chamberlain et ah, 1997). Exchange rate volatility might affect the price of domestic products, import, export, and FDI etc. This in turn might influence banks portfolio and operation in different ways.

Rao and Lakew (2012), Kanwal and Nadeem (2013), Pan and Pan (2014), Ongore and Kusa (2013), Kiganda (2014), similarly examined the effect of these internal and external factors on the bank's profitability. But, very few of these studies have assessed the impact of exchange rate (one of the macroeconomic factors) on banks corporate performance. For example, Kiganda (2014) in his study of the effects of macroeconomic factors on commercial banks profitability in Kenya found that exchange rate has negative 'insignificant effect on the banks profitability as expressed by ROA'.

Hence, this study will evaluate the effect of exchange rate volatility (changes), tor the period of 1986 to 2016 on the corporate performance of deposit money banks in-Nigeria as a result of the recent high foreign exchange fluctuations. This study is important because operations in the foreign exchange market which is a veritable component of banking operations has significant implications for banks credit to the domestic economy, internal reserves and their general intermediation operations (Ngerebo, 2012). As such in today's Nigerian economy, any company, including banking firms, trading in the local markets is affected by foreign exchange rate volatility which are as a result of uncertainty in transactions both in goods and financial assets.

Research Methodology

This study adopts a quantitative research methodology and time series data which also involves an exploratory research design using ex-post facto design. The study variables include; independent and dependent variables. The exchange rates volatility, which is measured by the return average annual values of US dollar to Naira for the thirty-year period 1991-2021, is the independent variable (EXCR); the dependent variable, deposit money banks corporate performance, is measured by the credits commercial banks offer to the economy at large and the customer deposit size.

Model Specification

Two econometric models are specified to measure how exchange rate volatility affects the corporate performance of Nigerian deposit money. Accordingly, the first econometric model indicated by equation (i) is developed to measure the impact of exchange rate on

the profitability of the Nigerian deposits money banks. The bank profitability (dependent variable) is represented by return on equity (ROE) which is calculated by dividing the after-tax net profit by average equity. This model is further adjusted to include control variables as indicated by equation (ii)The second econometric model as represented by equation (iii) is specified to determine how exchange rate variations affect the size of deposits money banks in Nigeria. Again, this model is adjusted to include other independent variables as a control variable.

Model 1; Measurement of the Effect of exchange rate on profitability (ROE)

The model used in this research work is in consonance with that of Osundina, C. K, Osundina J. A, Jayeoba O. O and Olayinka I. M (2016). They empirically examined the effect of exchange rate fluctuation on banks performance in Nigeria covering the period of ten years between 2005 and 2014 and found out that exchange rates fluctuation had an insignificant effect on banks profitability using ROA as a measure while exchange rates fluctuation had a significant negative effect on banks liquidity using LDR as a measure. Their model was specified as follows;

$$CBC = X_1 + X_2EXCH + X_3LR \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$LDR = X_1 + X_2EXCH + X_3LR \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Therefore, as a result of their conclusion which explains that "the effect of exchange rates fluctuation on banks performance is subjective on the specific measure of performance used in the research", with little modification, the model for this research work is expressed as;

$$ROE\,it = \beta 0 + \beta 1EXCR + \mu it \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (i)$$

Where;
CBC = Commercial banks credits.
EXCH = Exchange rate.
LR = Lending rate.
CoD = Customer deposits
USD = the exchange rate of USD to NGN at time t,
μit = the stochastic error term.

However, since there are other variables which serves as determinable factors to the profitability of banks, their exclusions from the model may result in exaggerated estimates of the changes in the bank return on equity (ROE) attributable to exchange rate volatility.

Therefore, model indicated by equation (ii) is specified to include key control variables that could affect bank's profitability (ROE). The control variables included in the model are EXCHANGE RATE, GROSS DOMESTIC PRODUCT, TOTAL DEPOSITS, AND TOTAL ASSETS

$$ROEit = \beta 0 + \beta 1EXCR + \beta 2GDP + \beta 3TDPO + \beta 4TA + \mu it \ldots\ldots\ldots\ldots \quad (ii)$$

Where;
ROEit = the return on equity of bank i at time t.
EXCR = Exchange rate volatility
GDP = gross domestic product growth attributable to bank i at time t.
TDPO = total deposit of bank.
TA = total asset of bank
μit = the stochastic error term.

The impact of each of the explanatory variables on the profitability of deposit money banks in Nigeria is assessed using the above multivariate regression equation by using the statistical significance of the coefficients (βi).

Model 2; Measurement of the effect of exchange rate on bank size
With little adjustment, as a result of the introduction of different dependent variable and a new independent variable, stated below is the Second model specified for this study. Implicitly the model is stated as follows.

$$TAit = \beta 0 + \beta EXCR + \mu it \ldots\ldots\ldots\ldots \text{(iii)}$$

Explicitly the model is stated as follows;

$$TAit = \beta 0 + \beta 1EXCR + \beta 2GDP + \beta 3TDPO + \beta 4PAT + \mu it \ldots\ldots \text{(iv)}$$

Where
TAit - Total Asset of bank i at time t
EXCR= Exchange rate volatility
GDP = gross domestic product growth attributable to bank i at time t.
TDPO = total deposit of bank i at time t.
PAT - Profit after tax of bank i at time t
μit = the stochastic error term

Return on equity (ROE)
Net interest margin (NIM), return on asset (ROA) and return on equity (ROE) are the frequently used ratios in measuring bank profitability (Rao and Lakew, 2012). Return on Assets (ROA) indicates how effectively a bank manages its assets to generate income (Davydenko as cited in Kiganda, 2014) and it is computed as the banks' after-tax profit over total assets. In contrast, the return on equity (ROE), the ratio of net profit to equity, measures the extent to which the bank's management is generating returns using the equity of the bank's shareholders.

Data Analysis
The data is analyzed through the usage of an auto regression conditional model which is a means for measuring risk. This type of model specifies the conditional variance as a deterministic function of lagged squared residual and the specification does allow the uncertainty measure to be affected by the state of the economy and it equally allows this measure to be entered into a Variable Auto Regressive (VAR) model specification, while

directly measuring access to the dynamic relationship between the volatility and economic performance. However, the GARCH model was also used in analyzing the level of volatility of the exchange rates. Data analysis is conducted using E-VIEWS 8, an econometric estimation software, statistical and other econometrics techniques. The E-VIEWS 8 is used because it helps in the detection and correction of serial autocorrelation. Tables and figures are used for the presentation of data.

Sources of Data

This study exploited the usage of secondary sources of information. The data source is limited to the US Dollar/Naira exchange rate because the dollar is the principal payment currency for majority of Nigeria's international transactions and is considered a stable currency in the foreign markets.

Data where sourced from the central bank of Nigeria (CBN), Federal bureau of statistic (FBS) Security and Exchange Commission (SEC) Fact book and other.

Data analysis and interpretation of results

Table 1: Descriptive Statistics

	CBC	CD	LR	EXCH
Mean	7519.111	4197.613	17.59464	82.78876
Median	1070.020	476.3509	17.58000	92.69335
Maximum	34593.89	19146.81	29.80000	305.7901
Minimum	19.47750	10.67690	7.750000	0.636900
Std. Dev.	10768.32	6297.820	4.690721	80.40374
Skewness	1.225774	1.291029	0.189886	0.713684
Kurtosis	3 051790	3133282	3.572681	2.868262
Jarque-Bera	9.269690	10.30571	0.727959	3.167718
Probability	0.009708	0.005783	0.694906	0.205182
Sum	278207.1	155311.7	651.0015	3063.184
Sum Sq.Dev.	4.17E+09	1.43E+09	792.1032	232731.4
Observation	37	37	37	37

Source: Researcher's Computation, 2022

The study first takes a look at the descriptive statistics of the variables under study. The mean, median, maximum, minimum, standard deviation and Jarque-Bera statistics, showing the normality of the variables, are explained. The average amount given out as credit to the economy by the commercial banks within the study period equals #7,519.11 Billion, customers total deposit has an average value of #4,197.61 Billion, the average rate of lending funds to the public by the commercial banks is 17.59%, and the average exchange rate of a US Dollar to Naira is #82.78.

The maximum value of commercial banks credits, a measure of performance of the commercial banks, stood at #34,593.89 Billion while it was lowest at #19.47 Billion. #19,146.81 Billion was recorded as the maximum amount of customer deposit for the

period of study while it was #10.67 on the minimum. The commercial bank lending rate was highest at 29.8% and 7.75% was the lowest rate for the period of study. Exchange rate stood at #305.79 per Dollar on the maximum and #0.63 per Dollar on the minimum. It was further discovered in the result of the descriptive summary that the standard deviation of the variables are #10,768.32, #6,297.82, 4.69%, and #80.40 per Dollar for commercial bank credits, customer deposits, lending rate, and exchange rate respectively.

Correlation Matrix

Table 2: Correlation Matrix

	CBC	CD	LR	EXCH
CBC 1				
CD	0.9966	1		
LR	-0.0659	-0.0716 1		
EXCH	0.8776	0.8547	0.0902	1

Source: Researcher's Computation, 2022

Correlation coefficient is used to measure the association that exists between two variables. The association ship could either be positive or negative and is ranged between 0 and 100 percent. The association between commercial bank credits and customer deposit is found by the study to be very strong and positive. The correlation coefficient between commercial bank credits and customer deposits is 99.66% which indicates a very strong and positive correlation. Commercial bank credits and lending rates have a negative but very weak correlation. It was also observed in the study that exchange rate and commercial banks credit have a positive and strong association ship while exchange rate and customer deposits and exchange rate and lending rate exhibit positive correlation. Finally, the study found out that the correlation between customer deposit and lending rate is negative and very weak.

Presentation of Result

Table 3: Shows the summary of results obtained from GARCH

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EXCH	17.31354	1.061671	16.30781	0.0000
LR	-1.580017	0.563183	-2.805511	0.0050
Variance Equation				
C	290.4392	619.0494	0.469170	0.6389
RESID(-1)^2	2.156088	1.290672	1.670515	0.0948
GARCH(-l)	-0.009111	0.302163	-0.030152	0.9759
R-squared	60.120977	Mean dependentvar		7519.111
Adjusted R-squared	59.153004	S.D. dependent var		10768.32
S.E. of regression	11562.81	Akaike info criterion		16.00463
Sum squared resid	4.68E+09	Schwarz criterion		16.22232
Log likelihood	-291.0856	Hannan-Quinn criter.		16.08137
Durbin-Watson stat	2.018854			

Source: Author's Computation (2022)

The result of the test in table 3 above is used to provide empirical answers to the first objective of the study which aims to look at the effect of exchange rate volatility on the performance of deposit money banks in Nigeria. The hypothesis states that there is no significant effect of exchange rate volatility on the performance of deposit money banks in Nigeria. While measuring the performance of deposit money banks, total credit made by the deposit money banks is used as a proxy for performance. It is expected that the commercial banks are said to be performing by the amount of funds lent out by the commercial banks to the general public. The result of the test indicates that there is a positive and significant relationship between exchange rate volatility and the performance of commercial banks in Nigeria. It is shown in the result that a percentage increases in exchange rate volatility will increase commercial banks performance. This is against *Apriori* expectation and it is against theory. It is generally believed that exchange rate volatility measures the swing in exchange rate of an economy, say, Naira to US Dollar.

Lending rate, a controlled variable introduced in the model exerts a negative but significant relationship with commercial banks credit to the economy. It is discovered that a percentage increase in lending rate will reduce commercial banks performance by reducing the amount of credit to the public for investment opportunities. On the issue of coefficient of determination, 60.12% of the variations in commercial banks deposits are explained by changes in exchange rate volatility and lending rate. The result of the Durbin Watson test also implied that the regression result is free from autocorrelation and that the model is fit for forecasting.

In providing empirical answers to the second objective of the study, Table 4 below shows a summary of the result of the GARCH test.

Table 4: Summary of the GARCH Result

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EXCH	5.924218	0.383977	15.42858	0.0000
LR	-0.499756	0.281453	-1.775626	0.0758
Variance Equation				
C	27.00324	106.2613	0.254121	0.7994
RESID(-1)^2	1.956959	0.966118	2.025590	0.0428
GARCH(-l)	-0.005429	0.412296	-0.013169	0.9895
R-squared	77.234178	Mean dependent var		4197.613
Adjusted R-squared	72.269441	S.D. dependent var		6297.820
S.E. of regression	7095.720	Akaike info criterion		14.48537
Sum squared resid	1.76E+09	Schwarz criterion		14.70306
Log likelihood	-262.9793	Hannan-Quinn criter.		14.56211
Durbin-Watson stat	2.019149			

Source: Author's Computation (2022)

In examining if any significant relationship exists between exchange rate volatility and customer deposit, another proxy for measuring commercial bank performance, shows a positive and significant relationship with customer deposits. Exchange rate volatility possesses a positive and running from exchange rate volatility to commercial banks performance. This indicates that exchange rate volatility granger causes commercial banks performance. Also, the result of the granger causality test indicates that exchange rate volatility and customer deposits have a unidirectional causal relationship with the direction of causality running from exchange rate volatility to customer deposit. The study therefore concludes that exchange rate volatility granger causes commercial banks performance in the Nigerian economy.

Table 5: Diagnostics Results

Diagnostics test	**Observed value**	**P-value (Chi-square)**
Breusch-Godfrey LM test for Serial Correlation	1.091603	0.5794
Heteroskedasticity Test: Breusch-Pagan-Godfrey	5.722184	0.6783
Misspecification Test (Ramsey Reset Test)	0.503963	0.4843
Normality Test (JarqueBera)	0.367527	0.8321

Source: Researcher's Computation, 2022

Breusch-Godfrey Serial Correlation LM Test indicates that the model has no serial correlation. The second test for Heteroskedasticity reveals that our model is homoskedastic. These results are desirable and confirms that the overall results are non-spurious hence reliable. The Ramsey test results evidence the stability of the model and absence of misspecification. Finally, the result indicated that the regression model is normally distributed.

Summary and Implications of the Study

The study has done justice to examining the effect of exchange rate volatility on the commercial banks credit to the economy at large and on customer deposits as well as investigated the causal relationship between exchange rate volatility and commercial banks performance. It has been discovered in the study that exchange rate volatility significantly affects the performance of commercial banks positively. This explains that, in the Nigerian economy, exchange rate volatility is advantageous to the growth in credit allocation in the economy. This is basically against what is theoretically profound. However, it has been shown in the study that exchange rate volatility has a positive effect on bank performance in the Nigerian context. On the issue of causality, the study has found out that exchange rate volatility granger causes commercial banks performance.

Summary

The study investigated the effect of exchange rate volatility on corporate performance of deposits money banks in Nigeria. To achieve the objectives of the study and also buttress the justification of the study, Vector error correction model (VECM) was adopted as a result of its appropriateness in capturing shocks that accompany or perhaps determine

the corporate performance of deposits money banks in Nigeria. The study employed GARCH method of estimating volatility in order to capture the volatility clustering that is associated with exchange rate and also generate the exchange rate volatility series in order to investigate its impact on corporate performance of deposits money banks in Nigeria. Using data sourced from the Central Bank of Nigeria's Statistical Bulletin and security and exchange commission facts book, the results of the GARCH model as well as the VECM analysis were constructed. The augmented Dickey Fuller test and Phillips Perron test was used to test for the stationarity of the variables.

The results of the stationarity tests showed that only exchange rate volatility, gross domestic products (GDP), and total deposits (TDPO) were stationary at level, while the other variables: profit after tax (PAT), return on equity (ROE), and total assets (TA) were stationary at first difference. Descriptive statistics was used to understand the data, Johansen co-integration test was used to determine whether there exists a long-run relationship between the variables and the results revealed the presence of long run relationship between the five variables. Granger causality test was adopted to estimate the direction of causality between the variables which indicate a unidirectional causality running from exchange rate to the profitability (ROE), and Bank size (TA) of deposits money banks in Nigeria at the 5% level. The results of the variance decomposition and impulse response showed that innovations m the variables are mostly explained by their own shocks, except for profit after tax (PAT).

Conclusion

In conclusion, the results of the GARCH model shows that there is an existence volatility in the rate of exchange in Nigeria and the results further revealed that the periods of low volatility are followed by the periods of low volatility for a prolonged period; also, the periods of high volatility is followed by the periods of high volatility for which revealed that the exchange rate volatility is cluster and volatile. Furthermore, the empirical findings through the impulse response and variance decomposition have revealed that exchange rate has a negative and positive short and long run relationships on bank size and profitability of deposits money banks in Nigeria, respectively. The result suggests that the corporate performance of deposit money banks in Nigeria is likely to improve when there's depreciation in the exchange rate. i.e., increase in the exchange rate will lead to a favorable balance of payment. The result also suggests that the Marshall-Lerner (ML) condition holds for Nigeria. This result is consistent with the findings of Owoeye and Ogunmakin (2013), on the effects of exchange rate volatility and bank performance in Nigeria. Granger causality test also indicated a unidirectional causality running from exchange rate volatility to balance of payment in Nigeria, what this means in essence is that past values of exchange rate depreciation have predictive effects on present corporate performance of deposits money banks' position.

Furthermore, in reference to the analysis of exchange rate volatility brought under review in this study, there is a tendency to assume that with all this knowledge, experts should be quite adept at forecasting future exchange rates. In fact, forecasting future spot exchange

rates is difficult. Although researchers have shown the analysis covered in this study to be relevant in terms of explaining systematic patterns of exchange rate movements, the usefulness of these theories for predicting future exchange rates is limited to the propensity for the unexpected to occur. The real world is characterized by unpredictable risks or uncertainties.

Consequently, the findings in this study revealed exchange rate volatility is almost positively related to gross domestic products, total assets, total deposits and profits after tax. However, return on equity has negative effect on exchange rate volatility. The evidence in vector auto regression analysis indicated that there has been a significant dynamic in the exchange rate on deposits money banks corporate performance in recent time, and the changes in rates significantly affect the performance of all financial institution in general and the banking industry specifically within the overall economy.

The evidences obtained also indicated that the exchange rate changes also exert an impact on deposits money banks corporate performance over a period of time. Given the foregoing, it is therefore concluded that there is a significant impact of exchange rate fluctuations on banks corporate performance and a well-managed exchange rate is capable of driving immediate and improved performance of banks within the Nigerian economy. Though, external factors, like, Gross domestic products and predetermined internal factors go a long way in determining the impact of exchange rate on banks corporate performance, which are also crucial to the development of the banking system.

Conversely, international investors usually manage their exchange rates uncertainties independently from the asset and liabilities. Since their currency exposure is related to translation risk on asset and liability denominated in foreign currencies, they tend to consider currencies as a separate assets class requiring a currency over lay mandate.

Recommendations

Overall, the prices of foreign currencies in term of a local currency (foreign exchange), is therefore important to the understanding of the economic happenings in a country, which includes the activities of deposits money banks, and also critical to direct administrative control of foreign exchange market participants' independence. Similarly, the portfolio balance frame work, net financial wealth (explained as the sum of non-interest-bearing money), domestic bonds (expressed in a unit of domestic currency), are all critical to achieving a low-risk foreign exchange position.

It is therefore recommended that;

1. A sound exchange rate policy should be instituted by the management of deposit money banks, as an effective measure of managing exchange rate uncertainty.
2. It is equally recommended that Nigeria banking industry should operate within the framework of best global practices and external requirement as regard exchange rate position in order to avoid exchange rate volatilities and rigidities.
3. It is equally suggested that relevant regulator}- authorities should pay more attention to macroeconomic stability and the enhancement of efficiency which

will guarantee a more stable economic environment which in turn will encourage the performance of banking sectors for exchange rate stability in Nigeria economy.

4. Foreign exchange rate volatility or instability should be effectively managed, because failure of effectively managing same will result in an adverse effect, such that industrialists, investors, and major players in cross national trading will be significantly constrained in their projected plan, revenue and cost as well as profit margin.
5. It is equally recommended exchange rate changes should follow inflation differential through (PPP) purchasing power pricing which will help individual firms and banks to have alternatives that will enable them to introduce cost inflation above the general inflation rate and ultimately find these alternatives competitiveness eroding.

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