

## Does Interest Rate Margin Affect Banks' Performance in Developing Economy? The Nigeria Experience

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### ABSTRACT

This study examines the consequence of interest rate margin on the performance of deposit money banks in Nigeria. The primary objective is to demonstrate how interest rate margin affects the performance of the deposit money banks in a developing economy using Nigeria as a case study. The data used in the study were obtained from the CBN within the sample period of 1980 to 2016 and was analyzed using error correction model approach. Profitability rate is the dependent variable while interest rate, deposit rate, monetary rate and lending rate were proxies for independent variables. The results show that all the independent variables had a significant effect on profitability rate in Nigeria for the period under review. The cointegration test revealed that the variables had a long run relationship with bank profitability in Nigeria within the sample period. The  $R^2$  (0.87), showed that 87% of the changes in bank profitability was as a result of fluctuations in the explanatory variables. Based on these findings, it was discovered that the interest rate had a negative significant effect on the profitability and overall performance of the deposit money banks in Nigeria. Therefore, for profitability of the deposit money banks to be improved, there is the need to reduce the rate of interest as this will help attract individuals to get loans for investment purpose hence improve profitability.

Keywords: Interest rate, Bank Performance, Deposit money bank, Developing Economy.

### INTRODUCTION

The financial systems of most developing economy are under pressure and stress as a result of the economic stun. These economic quivers largely manifest through indiscriminate distortions of financial prices via interest rates. The resultant effects perhaps lead to reduction of the real rate of growth and real size of the financial system vis-a-vice non-financial magnitudes [1]. In the Nigerian case for instance, [2], posit that Nigerian economy witnessed different sectors in 1970s through the mid-1980s due to regulated regime. From traditional, theoretical and empirical view points, banks have the potential and prospects for mobilizing financial resources and allocating them to productive investments which in return promote the performance of banks. Therefore, no matter the

sources of income generation or the economic policies of the country, Deposit Money Bank would consistently play their traditional role of advancing loans to their numerous customers bearing in mind, the tripartite principles of profitability, liquidity and solvency guiding their operations [3]. These principles no doubt revolve around interest rate. Some authors prefer to use the term net interest margin when using ex-post data (difference between banks quoted lending rate and deposit interest rate) [4] [5]. For the purpose of avoiding ambiguity in this study, interest rate margin is defined in broad term as the ratio of difference between interest income and interest expenses to total assets for individual banks. Basically, high margin increases banks profitability

and tends to decline the efficiency of financial intermediation process, and efficient financial intermediation is a necessary condition for the achievement of price stability of the monetary authority and growth of the economy.

This margin has remained relatively high over the years in Nigeria with adverse implications for savings mobilization and investment. This paper interrogates the controversial argument in interest rate. For example, a lower deposit rate encourages saving and therefore reduces bank deposit, resulting in scarcity of investible funds. On the contrary, high lending rates curtail borrowing and investment. In an economy like Nigeria where the bulk of intermediation is by the banks, the scenario could stifle investment and curtail growth in the economy. Under this condition, whether the banking system performance is safe or not is a big query.

Importantly, the big challenge is the persistent nature of the high interest rate and the controversies of its mechanisms. From the days of the Nigerian government deregulated interest rate in 1987 as part

#### LITERATURE REVIEW

##### **Conceptual clarification**

##### **(a) The concept of Interest rate**

According to Keynes, interest rate is the reward for not hoarding but for parting with liquidity for a specific period of time. Keynes' definition of interest rate focuses more on the lending rate. [7] defines interest rate as the return or yield on equity or opportunity cost of deferring current consumption into the future. Some examples of interest rate include the saving rate, lending rate and discount rate. [8], states that interest rate is the price which equates the supply of 'credit' or savings plus the net increase in the amount of money in the period the demand for credit or investment plus net 'hoarding' in the period. This definition implies that an interest rate is the price of credit which like other prices is determined by the forces of demand and supply (that is, the demand and supply of loanable funds).

Further, Interest rate is the amount paid per unit of time expressed as a percentage

of the Structural Adjustment Programme (SAP) policy package; the official position was that interest rate liberalization among other things, enhance the provision of sufficient funds for investors especially manufacturing sector- the priority sector, who were considered to be prime agents and by implication promoters of economic growth, but the high interest rate has persisted. Under normal circumstance, high interest rate should spur the desire for bank vaults. Likewise, low interest rate should naturally discourage depositors. But most often times, this is not the case; hence this study seeks to examine how interest rates affect the performance of Deposit Money Banks in Nigeria. As such, this study is motivated to address the protracted question on whether interest rate margin affect banks' performance in developing economy in line with paper's earlier interrogation. Specifically, the study seeks to ascertain the effect of interest rate margin, monetary policy rate, lending rate and deposit rate on the performance of deposit money banks with Nigeria in focus.

of the amount borrowed [9]. Therefore, the cost of borrowing money measured in naira per year per naira borrowed is the interest rate. When maturity and liquidity together with other factors are considered, many different financial instruments and so many interest rates will emerge [10]. Interest rate can either be nominal or real. Nominal interest rate can be measured in naira terms, not in terms of goods. The nominal interest rate measures the yield in naira per year, per naira invested while the real interest rate is adjusted for inflation and is calculated as the nominal interest rate minus the rate of inflation [11]

According to Keynes, interest rate is the reward for not hoarding but for parting with liquidity for a specific period of time. His definition of interest rate focuses more on the lending rate. [12] defines interest rate as the return or yield on equity or opportunity cost of deferring current consumption into the future. Some examples of interest rate include

the saving rate, lending rate and discount rate. [13] defines interest rate as the rental payment for the use of credit by borrowers and return for parting with liquidity by lenders. Like other prices, interest rates perform a rationing function by allocating limited supply of credit among the many competing demands. Interest rate, very often appears in monetary policy deliberations. However, [14] states that interest rates are charged for a number of reasons, but one is to ensure that creditors lowers his/her exposure to inflation. Inflation causes a nominal amount of money in the present to have less purchasing power in the future. Expected inflation rates are an integral part of determining whether or not an interest rate is high enough for the creditor. The real interest rates represents a fundamental valuation of temporary provision of capital (money) corresponding to a price level constant in time. It is also obvious from the above relation that if inflationary expectations change, nominal interest rates have to change aliquot at a constant real interest rate [15]. The real interest rate concept is irreplaceable in the research into the mutual relations of inflation, because assuming that the creditors are rational, inflation and nominal interest rates influences each other. For similar reasons, the real interest rate is used in broader economic analysis.

[16] investigated the determinants of interest rate spread in Nigeria using panel data for the period 1986-2007, for 12 Deposit Money Banks. Their result suggested that average loans to average total deposits ratio, remuneration to total assets ratio, cash reserve requirements and gross domestic product have effects on interest rate spread positively. However, their results also shows that non-interest income to average total assets ratio, treasury certificate and development stocks have a negative effect in interest rate spreads. In summary, their result suggested that a reduction in cash reserve ratio, as well as a reduction in bank overhead costs amongst others will help to moderate high interest rate spread in Nigeria.

### **(b) Interest Rate Charged on Borrowers**

There are daily reports of how Nigerian banks rip off their customers through various charges and practices. Oftentimes, customers complain and cry out for appropriate regulatory intervention. Unfortunately, their complaints seem to fall on deaf ears because they are unaware of any positive regulatory action in response thereto. Emboldened by regulatory inactions and indifference (which suggest tacit approval), many Nigerian banks now engage in more exploitative practices. The categories of such predatory bank practices are unfolded daily.

Normally, when a customer secures a loan from a bank, the latter fixes a negotiated lending rate based on the prevailing interest rate approved by the apex bank. Any changes in the interest rate should be brought to the notice of the borrower except otherwise agreed. In Nigeria, the lending rate is rarely negotiated and when it is reviewed upwards by the CBN the average bank automatically applies the new rate to the outstanding loan without notifying the borrower [17]. Ironically, the same bank hides the fact of any downward review of the lending rate from its mostly uninformed customer, thereby illegally subjecting the customer to a higher interest regime.

Often, what the bank staff presents to a prospective borrower during loan negotiations as the total charges become hydra-headed once he swallows the bait. While processing loans, Nigerian banks impose on borrowers both "processing" and "administrative" fees which are duplicates. Again, they charge borrowers and corporate customers higher than what they pay lawyer to conduct searches at land and company registries. We believe that the interest rates Nigerian bank display at their offices and reports to CBN per section 23 of the Banks and Other Financial Institution Act (BOFIA), chapter B3, laws of the federation of Nigeria 2004) are different from what most of them impose on customers. To verify this, CBN may wish to randomly obtain and examine depositors/borrowers account statement from banks.

### Synoptic Empirical Review

Quite a number of empirical studies have been carried out by different scholars on the effect of interest rate margin and bank deposits on different dimensions; some of these studies are reviewed below. [18] used non parametric method in his study of the relationship between interest rates and other macro economic variables, including savings and investment. In their study, they grouped sixty-four (64) developing countries including Nigeria into three bases on the level of their real interest rate. Applying the Mann-Whitny Test, they observed that the effect of real interest was not significant for the three groups. Again, [19] argues that financial intermediation could affect the savings rate, and then capital formation and growth through its impact in four different factors: i) Idiosyncratic risk, ii) Rate-of-return risk, iii) Interest risk, and iv). Liquidity constraints. A number of recent studies, however have shown that Deposit Money Banks have seem to improve banking system efficiency and thereby contribute to overall banking stability in developing countries [3], [4], [5], [6] [7].

On the other hand the effect of bank credits in developing countries especially in Nigerian remains largely unexplored. As such, [8] discuss the effect of deposit interest rate and interest amount. They observed that the method of calculating the interest amount can substantially affect interest paid. Depositors should take into consideration the interest rate computation over and above the quoted nominal rates. Since 89% of the customers are depositors, a high degree of transparency is needed in regard to effective rates offered to customers. [2] provided empirical evidence on the determinants of interest rate spread in a liberalized financial system for the period 1989-2000 by estimating ex-ante interest spread with balance sheet and income statement data from thirteen (13) banks in Nigeria in addition to some macro economic variables. It was found that macroeconomic as well as monetary policy/financial regulation factors were more important than banks' level factors.

In fact, cash reserve requirement, GDP, risk premium, inflation rate, financial deepening, liquidity risk, loan asset quality, Treasury bill rate and non-interest expense were the most important factors that influenced DMBs interest spread during the period of study.

[9] studies the differential impact of interest rate on bank's performance. The study reveals that according to the financial liberalization theory, we should expect that in economies with very low or negative real interest rate, a positive shock to interest rate would cause appositve effect on private investment which will in turn increase the profitability of banks. On the other hand, he notes that a higher interest rate, the borrowers will be eager to borrow; this will have a negative effect on both the bank in terms of its level of profitability and private sectors.

Similarly, [15] is of the opinion that policy makers should focus less of measures leading to increase in bank lending and concentrate more on legal, regulatory and policy reforms that boost the functioning of markets and banks. [11] in their study on Turkey concluded the economic growth lead to financial sector development. However, the proponents of supply-leading hypotheses are of the belief that banks lending is a veritable tool for attainment of economic growth and development. [16] used Error Correction Model (ECM) to investigate interest rate determination in Nigeria. The study found that as the Nigerian financial sector integrates more with global markets, return on foreign assets will play a significant role in the determination of domestic interest rate. Again, [8] used ordinary least square method to ascertain the assessment of the effect of interest rate deregulation in enhancing agricultural productivity in Nigeria. The study found out that interest rate play a significant role in enhancing economic activities and as such monetary authorities should ensure appropriate determination of interest rate level that will break the double-edge effect of interest rate on savers and local investors. Further, [13] assesses how

interest rate affects household savings in Chinese 31 provincial level administrative units between 1996 and 2009. A strong positive correlation between household savings and interest rates were established; suggesting that Chinese save to meet a number of needs (e.g.) retirement consumption and durables purchase. As such high savings rates enable them to meet their target savings. [16] used regression analysis to investigate the determinants of commercial banks lending behaviour in Nigeria. The study discovered that DMBs deposits have the greatest impact on the lending behaviour. [17] also looked at the Impact of Interest Rate Policy on Performance of Deposit Money Banks in Nigeria. The study observed that the current credit crises and the transatlantic mortgage financial turmoil have questioned the effectiveness of banks consolidation programme as a remedy for financial stability and monetary policy in connecting the defects in the financial sector for substantial development. Many banks consolidation have taken place in Europe, America and Asia in the last two decades without any solutions in sight to bank failures and crises. The study attempts to examine the performance of banks and macro-economic performance in Nigeria based on the interest rate policies of the banks. [15] investigated the determinants of interest rate spread

in Nigeria using panel data for the period 1987-2007 for 12 commercial banks. Their results suggested that average loans to average total deposit ratios, remuneration to total assets ratio, cash reserve requirements and Gross Domestic Product (GDP) impact on interest rate spread positively. However, the result also shows that non-interest income to average total assets ratio, treasury certificate and development stock have a negative relationship with interest spreads. In summary, their result suggested that a reduction in cash reserve ratio, as well as a reduction in bank overhead cost amongst others will help to moderate high interest rates spread in Nigeria.

[2], investigated the determinants of bank savings and bank credits on Nigerian economic growth from 1990-2006. The study adopted two impact model, Distributed Lag-Error Correction Model (DL-ECM) and Distributed Model. The empirical studies showed a positive influence of values of GDP per capita, Financial Deepening, Interest Rate Spread and negative influence of Real Interest Rate and Inflation Rate on the size of the private domestic savings. Also, a positive relationship exist between the lagged values of total private savings, private sector credit, interest rate spread, exchange rate and economic growth.

#### THEORETICAL REVIEW

Two most influential theories of interest rate are Irving Fisher's classical approach, extended to laonable funds theory and liquidity preference theory, developed by John M. Keynes. Accordingly, interest rate is determined as the price paid by borrowers to a lender for the use of resources during some interval [19]. There is no single measure of interest rate in the economy. However, yield to maturity on assets is accepted by most economists as a measure of interest rate [14]. Thus, individual may either consume or save their incomes. Individuals save when they consider future consumption, they consume less now to be able to consume more lately. The factors that influence savings decisions differ

between individuals. First among the factor is income. With higher income, individual may save more, though the decision to save is determined not only by the level of income, but also by expectations about future income, marginal propensities to consume and save-preferences to interchange consumption and saving between time periods [1].

[3] are argues that nominal interest rate can be determine by the number of monetary units to be paid per unit borrowed and real interest rate as the growth in the power to consume over the life of a loan. If there is no inflation in the economy, there would be no different to individuals whether interest rate is



nominal or real. Fisher was one of the first developers of the theory of interest rate and he was one of the first who introduced this distinction.

Fisher suggests that in long-run real interest rate is constant and expectations about inflation affect only nominal interest rates. Fishers' theory is very general and does not take into account many factors influencing the level of interest rate. The loanable funds theory extends Fisher's approach and incorporates into the analysis government actions, banks, bonds and cash investments. The results are similar to classical approach interaction of total demand for funds, negatively related to interest rate, and total supply of funds, positively related to interest rate determines the equilibrium interest rate and amount of savings or investments.

Basically, Keynes presupposes that money supply is not affected by the level of interest rate and government as the Central Banks control money supply in a country. The change in equilibrium interest rate may happen due to either supply or demand side changes. Main factors that affect the demand for money in liquidity preference theory are level of income and price level in the economy. Increase in income increases the demand for money due to higher liquidity of money. The same effect has an increase in price level. Operations of Central Banks and Deposit Money Banks affect money supply too. As a matter of fact, [6], [7] state that Central Banks control monetary base, which is currency in circulation and reserves, through several tools such as open market operation, purchase and sale of bonds, discount lending to banking system, reserve requirements on deposits in the banking system and foreign currency market operations [9]. Discount rate is especially important tool of influence on interest rates in the economy, since it does not only influence the price of credit resources for the banks, but also contains information on level of interest rates in the economy, so may be followed by commercial rates. The extent to which increase in monetary base may increase monetary supply is affected

by the level of required reservation, currency/deposit and reserve/deposit ratios or money multiplier. The result of money supply increase on interest rate is ambiguous, since according to [6], this contains different effects on the interest rate namely:

- Liquidity effect
- Income effect
- Price level effect and
- Expected inflation effect.

Liquidity effect theoretically reduces interest rate by shifting money supply curve to the right, and new equilibrium is with lower interest and larger money supply. This effect though maybe followed by other effects which would reserve the fall in interest. Income effect through influence of the expansion on aggregate demand will tend to increase demand for money and the effect is clear: it will increase interest rate. Price level effect of the increase in money supply also increases the demand for money and consequently interest rate. This effect works in similar fashion as income effect. If economy produces at full employment, increase in money supply most likely will lead to increase in inflation, and this recalling Fisher's law will increase nominal interest rate. In practice, it is impossible to predict which effect is prevalent after money supply increase. This effect will differ in different economies or even in one economy during different stages.

Since, the theory is extended to loanable fund theory it becomes imperative to link the two theories for emphasis and comprehensibility. Loanable Funds Theory synthesizes both the monetary and non-monetary effects of the problem (saving and investment process) [10]. It assumes the interest rate is determined by supply of loanable funds and demand for credit. It recognizes that money can play a disturbing role in the saving and investment process and therefore causes variation in the level of income. The theory suggests that interest rate equate the demand and supply of loanable funds. Loanable funds are the sum of money supplied and demanded at any time in the money market. Loanable funds theory has

implication on bank savers and borrowers and each side is well compensated at equilibrium, interest rate should be

structured in a way every party feel comfortable [7].

#### METHODOLOGY

The Research Design adopted in this study is *ex-post-facto* research approach which involves historic secondary data generated with respect to the research variables of the study. The researcher sourced the data used in this study from individual banks which includes four (4) Deposit Money Banks namely Zenith Banks Plc, Access Bank Plc, First Bank Plc, and Union Bank PLC. These four banks were selected out of 22 that are presently operating Nigeria, after the CBN capital reform in the industry. The Four banks were carefully selected based on the availability of data. Data from these banks were sourced from the statutory returns rendered to the Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC) on the electronic Financial Analysis and Surveillance System (eFASS). The secondary source was used because it requires the time series data of the interest rate and Monetary Policy Rate of DMBs which covers a period of thirty-seven years (37) from 1890-2016.

#### Description of Research Variables

The dependent variables and independent variables used in this study are described as follows: Performance in this study is measured by Profitability ratio. Profitability ratio is the ratio that measures the capability of a firm to generate profits out of the expense and the other cost incurred over a period of time. On the other hand, the independent variables of the study are as follows:

*Interest Rate:* Interest rate spread is one of the bank specific variables. It is broadly defined in this study as a ratio of the difference between interest income

and interest expense to total assets for individual banks.

*Monetary Policy Rate(MPR):* Government in a bid to regulate the affairs of the economy would always use MPR as one of its instrument, which is defined as the rate at which CBN lends to DMBs and other clients [9].

*Deposit Rate:* [2], defined deposit interest rate as the average rate paid by DMBs to individuals or corporations on deposits. This definition is adopted in this study.

*Lending Rate:* This is the rate that banks usually meets their short and medium term financing. [8] defined lending rate as the charge that a lender charges borrower in order to make a loan, same definition applies in this study.

#### Model Specification

The model adopted in this has been modified by the researchers. However, Due to the functional relationship, the model is specified as thus:

$$PRTR = \alpha + \beta_1 INTR_t + \beta_2 MTPR_t + \beta_3 DPTR_t + \beta_4 LNDR_t + \mu$$

The functional form stated above is transformed to accommodate the contemporaneous error ( $\mu$ ).

Where,

PRTR is profitability ratio, INTR is interest rate, MTPR is monetary policy rate, DPTR is deposit rate, LNDR is lending rate,  $\alpha =$  alpha,  $\beta_1-\beta_4 =$  Coefficients of the explanatory variables,  $t =$  time series,  $\mu =$  Error term.

#### Empirical Results

*Descriptive Analysis:* The descriptive analysis helps to show the characteristics of the data, it help to reveal if the times series data are normally distributed or not. Table one the descriptive nature of the data.

**Table 1: Descriptive Result**

|              | PRTR     | INT      | MTPR     | DPTR     | LNDR      |
|--------------|----------|----------|----------|----------|-----------|
| Mean         | 11.37892 | 12.09000 | 17.52649 | 7.465135 | 6.149730  |
| Median       | 10.53000 | 8.610000 | 17.59000 | 5.410000 | 6.720000  |
| Maximum      | 23.24000 | 43.57000 | 31.65000 | 18.80000 | 11.06000  |
| Minimum      | 5.270000 | 0.370000 | 8.430000 | 1.410000 | 0.320000  |
| Std. Dev.    | 4.085584 | 10.85473 | 5.134234 | 5.077767 | 2.869145  |
| Skewness     | 0.749743 | 1.426425 | 0.150020 | 0.756884 | -0.423176 |
| Kurtosis     | 3.444302 | 4.468714 | 3.328664 | 2.209563 | 2.324065  |
| Jarque-Bera  | 3.770704 | 15.87280 | 0.305317 | 4.495941 | 18.08681  |
| Probability  | 0.011776 | 0.000357 | 0.858423 | 0.015613 | 0.044809  |
| Sum          | 421.0200 | 447.3300 | 648.4800 | 276.2100 | 227.5400  |
| Sum Sq. Dev. | 600.9118 | 4241.706 | 948.9730 | 928.2139 | 296.3517  |
| Observations | 37       | 37       | 37       | 37       | 37        |

**Source: Researchers' Computation using E-view**

From the above results, observing the skewness value of the variables, it could be seen that all the variables except lending rate are positively skewed with their coefficients been 0.749743, 1.426425, 0.150020 and 0.756884. Lending Rate then had a negative value of -0.423176, hence, skewed to the left. The variables also have a positive kurtosis as their values are above zero (0). Hence, they are platykurtic. From the period covered in the study, it can be seen from

the table that the average points of the variables range from 6% to 17 for all the variables.

#### *Diagnostic Analysis*

- a. Unit Root:** The Augmented Dickey-Fuller (ADF) formula was employed to test for stationarity or the existence of unit roots in the data. The test results are as presented in table 2.

**Table 2: Augmented Dickey Fuller Unit Root Test Trend and Intercept**

| Variables | Level    | 1 <sup>st</sup> difference | Critical value (5%) | Order of integration | Remark     |
|-----------|----------|----------------------------|---------------------|----------------------|------------|
| D(PRTR)   | 1.791266 | 3.601033                   | 2.957110            | I(1)                 | Stationary |
| D(INTR)   | 3.534265 | 4.713614                   | 2.957110            | I(1)                 | Stationary |
| D(MTPR)   | 2.339071 | 5.216471                   | 2.951125            | I(1)                 | Stationary |
| D(DPTR)   | 1.855294 | 6.009461                   | 2.948404            | I(1)                 | Stationary |
| D(LNDR)   | 1.944776 | 6.326867                   | 2.951125            | I(1)                 | Stationary |



**Source: Researchers' Computation using E-view (See Appendix)**

From the table 2 above, all the variables Profitability Rate (PRTR), Interest Rate (INTR), Monetary Policy Rate (MTPR), Deposit Rate (DPTR), and Lending Rate (LNDR) were not stationary at level which necessitated the test at first differencing and at first differencing all the variables became stationary, as their various ADF values were greater than the 5% level of significance. As matter of fact, conducting

cointegration analysis becomes paramount.

**b. Autocorrelation:** The presence of autocorrelation is generally unexpected by the researcher. It occurs mostly due to dependencies within the data. For this study the Breusch-Godfrey Serial correlation LM test was employed and the result is as presented in table 3.

**Table 3: Breusch-Godfrey Serial Correlation LM Test:**

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 0.824835 | Prob. F(2,30)       | 0.4480 |
| Obs*R-squared | 1.928544 | Prob. Chi-Square(2) | 0.3813 |

**Source: Researchers' Computation using E-view**

From the table 3, the result from the Breusch-Godfrey serial correlation test, revealed that the F-statistics was 0.824835, and had a p-value of 0.4480. Also the Obs\*R-squared has a coefficient of 1.928544 and a p-value of 0.3813. It is observed that their p-values were significantly greater than the 0.05 level of significance. Hence, the study concludes that there is no autocorrelation within the series and therefore conclude that the result of the study is fit for policy formulation.

**c. Normality Test:** In statistics, normality tests are used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed; in our results, it shows a good normality distribution. See appendix.

**d. Heteroskedasticity :** In testing for heteroskedasticity in this study the Breusch-Pagan-Godfrey test was conducted and the test is as given below;

**Table 4: Heteroskedasticity Test: Breusch-Pagan-Godfrey**

|                     |          |                     |        |
|---------------------|----------|---------------------|--------|
| F-statistic         | 0.408796 | Prob. F(4,32)       | 0.8009 |
| Obs*R-squared       | 1.798768 | Prob. Chi-Square(4) | 0.7727 |
| Scaled explained SS | 1.163050 | Prob. Chi-Square(4) | 0.8841 |

**Source: Researchers' Computation using E-view**

From the table 4 above, it could be seen that the Obs\* R-squared and the F-statistics had a p-value that is less than the 0.05 level of significance, as such the null hypothesis of heteroskedasticity among the series is rejected

**Cointegration Test**

Cointegration was used to test for long run relationship between the variables considered. Cointegration is said to exist if the values of computed statistics are significantly different from zero or if the

trace statistics is greater in absolute value than the critical value at 5 percent level of significance. The model with lag 1 was chosen with the linear deterministic test

assumption and the result is presented below. Johansen cointegration test for the series include PRTR, INT, MTPR, DPTR and LNDR.

**Table 5: Cointegration**

| Included observations: 35 after adjustments  |            |           |                |         |
|----------------------------------------------|------------|-----------|----------------|---------|
| Trend assumption: Linear deterministic trend |            |           |                |         |
| Hypothesize d                                |            | Trace     | 0.05           |         |
| No. of CE(s)                                 | Eigenvalue | Statistic | Critical Value | Prob.** |
| None *                                       | 0.778105   | 136.5156  | 69.81889       | 0.0000  |
| At most 1 *                                  | 0.768655   | 83.82133  | 47.85613       | 0.0000  |
| At most 2 *                                  | 0.436841   | 32.58669  | 29.79707       | 0.0233  |
| At most 3                                    | 0.245637   | 12.48990  | 15.49471       | 0.1349  |
| At most 4                                    | 0.072232   | 2.624062  | 3.841466       | 0.1053  |

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values

**Source: Researchers' Computation using E-view**

From the result in table 5, the Johansen cointegration indicates three cointegrating equation. Cointegration is said to exist if the values of computed statistics are greater than 5% critical value. From the trace statistics, four of the absolute values of trace statistics were greater than 5% critical values. In other words, the null hypothesis of no cointegration among the variables is rejected at 5% statistically significant

levels. The test result shows the existence of a long-run equilibrium relationship among the variables, the need to further run ECM.

**4.4 Error Correction Model**

It has been pointed out that once there is a cointegration among the series, the error correction model will be employed to verify the dynamics of the short-run deviation to the long run equilibrium. The result is presented below;

**Table 6: ECM result**

| Included observations: 37 |             |            |             |        |
|---------------------------|-------------|------------|-------------|--------|
| Variable                  | Coefficient | Std. Error | t-Statistic | Prob.  |
| C                         | 0.004319    | 0.003076   | 1.403943    | 0.1700 |
| INTR                      | -0.108930   | 0.044335   | -2.456975   | 0.0103 |
| MTPR                      | 3.248420    | 1.090722   | 2.978229    | 0.0061 |
| DPTR                      | 152.1237    | 71.52630   | 2.126821    | 0.0264 |
| LNDR                      | -389.3445   | 193.7032   | -2.010006   | 0.0205 |
| ECM(-1)                   | -0.532745   | 0.175321   | -3.038683   | 0.0052 |

|                    |           |                       |          |
|--------------------|-----------|-----------------------|----------|
| R-squared          | 0.878243  | Mean dependent var    | 2503.994 |
| Adjusted R-squared | 0.849835  | S.D. dependent var    | 5537.624 |
| S.E. of regression | 4032.079  | Akaike info criterion | 19.58455 |
| Sum squared resid  | 4.39E+08  | Schwarz criterion     | 19.81357 |
| Log likelihood     | -308.3528 | Hannan-Quinn criter.  | 19.66047 |
| F-statistic        | 19.16084  | Durbin-Watson stat    | 1.841963 |
| Prob(F-statistic)  | 0.000244  |                       |          |

**Source: Researchers' Computation using E-view**

$$\text{PRTR} = 0.0043 - 0.1089\text{INTR} + 3.2484\text{MTPR} + 152.12\text{DPTR} - 389.34\text{LNDR}$$

From the results, ECM was consistent by assuming a negative sign, fractional and statistically significant. It has a coefficient of 0.53; showing that 53% of the fluctuations at the short run are corrected at the long run. The  $R^2$  is 0.87 and shows that 87% of the changes in the profitability rate are as a result of the changes in the explanatory variables, the remaining 13% are as a result of variables not included in the model but captured by the error term ( $\mu$ ).

Interest rate has a coefficient of -0.10; it shows that a 1% increase in interest rate will result to a decrease in the profitability rate by 10%. Interest rate was also statistically significant as the coefficient has a p-value which was less than the 0.05 level of significance. Monetary Policy Rate had a coefficient of 3.24; it shows that a unit increase in the

The study tried to verify the effects of interest rate margin on the performance of the deposit money bank, in the course of the empirical analysis, it was discovered that the variables employed for the study Profitability Rate (PRTR), Interest Rate (INTR), Monetary Policy Rate (MTPR), Deposit Rate (DPTR) and Lending

monetary policy rate will result to an increase in the profitability rate by 3.24 units. It was also statistically significant as it had a p-value which was less than the 0.05 level of significance. Deposit rate also had a coefficient of 152.12; this shows that a unit increase in the deposit rate will result to an increase in the profitability rate by 152.12 units. The coefficient was also statistically significant as it has a p-value that was less than the 0.05 level of significance. Finally, Lending rate had a coefficient of -389.34; this shows that a unit increase in the lending rate will decrease profitability rate by 389.34. This conforms to the apriori expectation and was also statistically significant as it has a p-value less than the 0.05 level of significance. The F-statistics was also statistically significant by assuming a coefficient of 19.1 with a p-value less than the 0.05 level of significance; this means that the explanatory variables jointly influence the profitability rate.

#### CONCLUSION

Rate (LNDR) had significant effects on the performance and profitability of the deposit money bank. It is thus, advised that if the recommendation highlighted below are employed, it will stir the economy at large to efficiency and will also enhance the performance of the deposit money banks in Nigeria.

#### RECOMMENDATIONS

In line with the study findings, the following recommendations are made;

- i. Firstly, it was discovered that the interest rate had a negative effect on the profitability and overall performance of the deposit money bank; it was observed that once the interest rate is high, investors tend not to borrow as they might

not be able to pay back. Therefore, for profitability of the deposit money banks to be improved, there is the need to reduce the rate of interest as this will help attract individuals to get loans for investment purposes. Hence, enhance profitability.

- ii. The lending rate of central bank of Nigeria to deposit money banks, needs to be reviewed to ensure that it conforms with the needs and aspiration of the people, as high lending rate will make funds unavailable within the economy and as well reduce the performance of the deposit money banks
- iii. Policies that will encourage the rate of deposit in Nigeria, needs to be adopted as an increase in the deposit rate will avail fund to the deposit money bank, which they utilize to increase their profit.

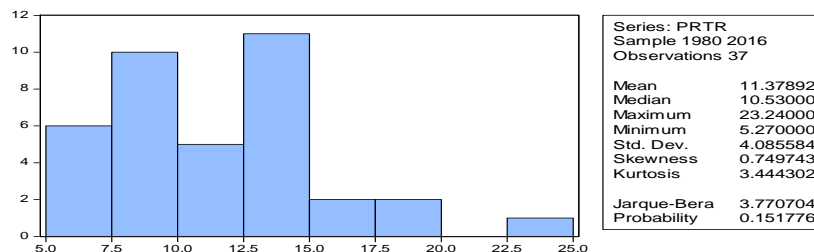
#### REFERENCES

1. Adebisi, M.A. and Babatpe-Obasa, B. (2004). Institutional Framework, Interest Rate Policy and Financing of the Nigerian Manufacturing Sub-Sector, A paper presented at the African Development and poverty Reduction (the macro-macro linkage) Conference at Lord Charlse Hotel Somerset West South Africa. 13-15<sup>th</sup> Oct.
2. Adofu, M.I. and Audu, S.I. (2010), An Assessment of the Effect of Interest Rate Deregulation in enhancing Agricultural Production in Nigeria. *Current Research Journal of Economic Theory*, 2(2): 82-86.
3. Akabom-Ita, (2012), Impact Analysis of Interest Rate on the Net Assets of Multinational Businesses in Nigeria, *Research Journal of Finance and Accounting*, ISSN 2222-1697 (paper) ISSN 2222-2847 (online) vol. 3, No. 7, 2012.
4. Akinlo, A.E and Owoyemi, B.O. (2012). The Determinant of Interest Rate Spread in Nigeria, An Empirical Investigation. *Modern Economy* 3, 837-845.
5. CBN (2016), Prudential Guidelines for Licensed Banks Issued by Central Bank of Nigeria (CBN) Lagos, Retrieved on December 18, 2016.
6. CBN/NDIC (1995), Distress in the Nigerian Financial Service Industry: CBN/NDIC Collaboration Study. Page Publishers Service Ltd, Lagos Nigeria.
7. CBN (1990), Prudential Guidelines for Licensed Banks. Banking Supervision Department (CBN).
8. CBN Statistical Bulletin, Vol. 27 (2016) and National Bureau of Statistics.
9. Enedu, C.I. (2003), Determinants of Commercial Bank Interest Rate Spreads in a Liberalized Financial System: Empirical Evidence from Nigerian Economic and Financial Review, VI.41 No. 1.
10. Engle, R.F. and Granger, C.W. (1987) C-integration and Error Correction: Representation Estimation and Testing. *Econometrical* Vol. 55(2), pp. 251-276.
11. Enyioko, N. (2012), Impact of Interest Rate Policy and Performance of Deposit Money Banks in Nigeria. *Global Journal of Management and Business Research* Vol. 12 Issue 21 online ISSN:2222-4588 & Print ISSN: 0975-5853.
12. Felicia, O.O. (2011), Determinant of Deposit Money Banks Lending Performance in Germany. *Schmalenbach Business Review (SBR)*, 52, 344-362.
13. Hayes, K.C. (2013), How Fiscal Policy and Interest Rates Impact Banks' Bottom Lines: A look at History Vale Walk: <http://www.valuewalk.com/2013/06/interest-rates-banks-earnings-good>, retrieved April 15, 2016.
14. Iklaga, F.O. (2008), Estimating a Monetary Policy Reaction Function for the Central Bank of Nigeria 1999-2007. Monetary Policy Department, CBN (online document).
15. Jhingan, M.L. (2003). Money, Banking International Trade and

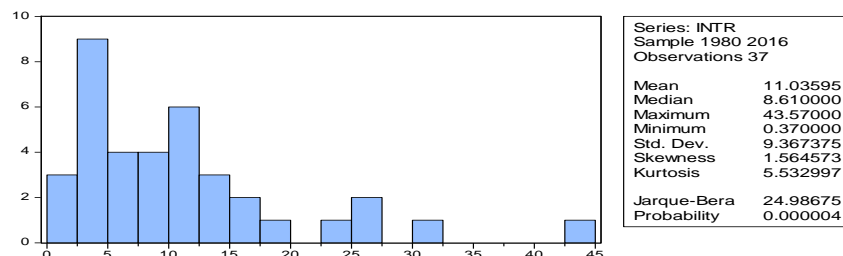
- Finance: 7<sup>th</sup> Revised Edition, Virinda Publications (p) Ltd Mayor Vihar Delhi.
16. Okoye, V. and Eze, O.R. (2013), Effect of Bank Lending Rate on the Performance of Nigerian Deposit Money Banks, International Journal of Business and Management Review Vol. 1., No. 1, March 2013, pp.34-43 published by European Centre for Research Training and Development UK ([www.Ea.Journals.org](http://www.Ea.Journals.org)).
  17. Rasheed, O.A. (2010), Interest Rate Determinants in Nigeria. International Research Journal of Finance and Economics, 2(3): 1-12.
  18. Tsuru, K. (2000), Finance and Growth: Theoretical Consideration and an Review of the Empirical Literature Economic Department working paper 228, Organization for Economic Cooperation and Development (OECD), Paris.
  19. Udeh, S.N. (2015), Impact of Monetary Policy Instruments on Profitability of Commercial Banks in Nigeria: Zenith Bank Experience, Research Journal of Finance and Accounting [www.iiste.org](http://www.iiste.org) ISSN 2222-1697 (paper) ISSN 2222-2847 (online) Vol. 6, No. 10, 2015, Available on [www.iiste.org](http://www.iiste.org).

### Appendix

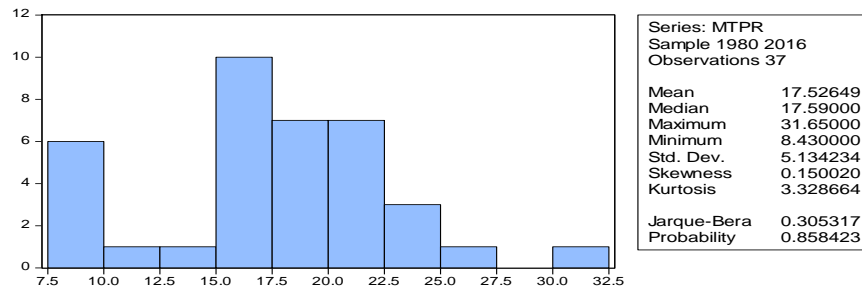
#### PRTR



#### INTR

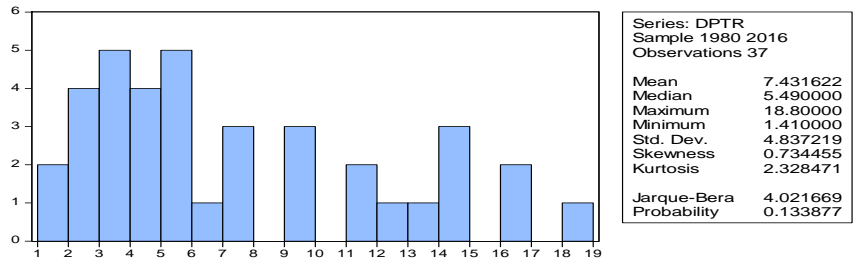


#### MTPR





### DPTR



### LNDR

