

## **EFFECT OF MONETARY POLICY ON DEPOSIT LIABILITIES OF COMMERCIAL BANKS IN NIGERIA**

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### **ABSTRACT**

*This study examined the effect of monetary policy on the financial performance of deposit money banks in Nigeria over a period of 19 years between 2000 and 2018. Specifically, the study established the effect of interest rate (INT) and cash reserve ratio (CRR) on the financial performance of deposit money banks. Secondary data were sourced from CBN statistical Bulletin. Being a time series data, the Autoregressive Distributed Lag Model (ARDL) regression technique was employed. The findings of the study indicated that interest rate and cash reserve ratio influenced the performance of banks in terms of their deposit liabilities. The study recommends that governments should ensure good and stable monetary policy in Nigeria such that deposit money banks' performance can be enhanced in Nigeria.*

**Keywords:** Monetary Policy, Interest Rate, Cash Reserve Ratio (CRR), deposit money banks

### **1.0 INTRODUCTION**

The development of a nation depends to a large extent on the soundness of the financial sector of which banking sub-sector is a key player. The banking sector serves as a channel for deposits mobilization and implementation of various monetary policies of the government which are introduced by the monetary authorities. As a stabilization policy, monetary policy involves the use of monetary instruments to regulate the volume, cost, availability and the direction of money and credit in an economy in order to achieve some specific macroeconomic objectives. According to Onouorah, Shaib, Oyathelemi and Friday (2011), monetary policy is described as a deliberate effort by the monetary authority to control the money supply volume and direction of credit in the economy with the aim of achieving certain economic objectives. Some of the macroeconomic objectives include price stability, full employment, sustainable economic growth, balance of payment equilibrium. Monetary policy determines the robustness of economic activities with its

attendant effects on available financial resources and its management in the banking sector (Aurangzeb, 2012; Ibeabuchi, 2012; Ojo, 2013).

When inflationary pressure is experienced in the economy, the monetary authority is expected to implement contractionary monetary policy to stabilize the price level (Onyeiwu, 2012). This could be carried out by increasing the reserve ratio or selling short-term securities to the public especially the banks. The action would thereby reduce the volume of money available to commercial banks for the purpose of credit facilities. In the same vein, the pressure on prices is expected to be abated in the economy through a reduction in the volume of money in circulation. On the other hand, if the monetary authority aims at increasing the aggregate demand in the economy, the reserve ratio may be reduced and short-term securities-treasury bills would be bought by the monetary authority.

Commercial banks are profit oriented organisation that are expected to make profit in order to maximize the wealth of the owners that is, shareholders (Alper and Anber, 2011). Therefore, it becomes imperative for them to perform financially. The performance of these banks can be measured or assessed through various parameters such as loans and advances, interest income, return on assets to mention a few (Ongore and Kusa, 2013; Uchendu, 2010; Uwazie and Aina, 2015). There is no doubt that the performance of the banks depend to a large extent on the various monetary policies issued out by the monetary authorities (Enyioko, 2012). Hence, the monetary authority regulates the economy through the adoption of various monetary instruments as the situation demands. The extent of the effect of these policies on the performance of commercial banks in Nigeria is the crux of this study.

Different studies had used various parameters or proxies for performance of deposit money banks. These include; loans and advances, profit after tax, profit before tax, private sector credit, return of assets, return on equity, interest income, earnings per share (Akomolafe, Danladi, Babalola & Abah, 2015; Mbabazize, Turyareeba, Ainomugisha & Rumanz1, 2020; Osakwe, Okoye, George & Okeke, 2021). But this study made use of deposit liabilities as measure of performance which makes this study to stand out from the previous empirical works on this investigation.

The remaining part of this study is segregated as follow; section two presents the literature review, section three deals with the method of analysis while section four presents the results and discussion. The last part covers the conclusion and recommendations from the study.

## **2.0 LITERATURE REVIEW**

Every nation strives to achieve economic objectives with the adoption of monetary policy. Onouorah *et al*, (2011) defined monetary policy as a set of rules and regulations imposed by the monetary authority on financial institutions especially banks in order to control the money supply and achieve economic growth (Imoisi, Olatunji and Ekpenyong, 2013). It is a deliberate effort to use changes in supply of money, cost, size and direction of credit to influence the economic activities with the aim of achieving macroeconomic objectives (Chigbu and Okonkwo, 2014). The instruments of monetary policy can be categorized into direct instruments and indirect instruments. Though there is an avalanche of instruments available for money and credit control, the instrument mix to be employed at any time depends on the goals to be achieved. Direct instruments of monetary policy are those measures that affect the bank financial institutions directly. The effectiveness of such instruments to a large extent hinges on the economic fortunes of the country

(Aurangzeb, 2012; Satta, 2014). These instruments include: reserve requirement, special deposit, moral suasion, selective credit control, direct credit control and prudential guidelines.

On the other hand, indirect instruments of monetary policy which are also called market-based instruments include fiduciary or paper money issued by the Central Bank on the basis of computation of estimated demand for cash. The commonly used instruments are open market operation (OMO), lending by the central banks, interest rate, exchange rate and rediscount rate. The macroeconomic objectives intended to be achieved with the monetary policy include, high level of employment, stable price level, maintaining sustainable economic growth rate as well as equilibrium of balance of payments (Onyemaechi, 2010). Cash reserve ration and interest rate were the proxies monetary policy as used in this study.

Financial performance gauged by profitability is considered in most business entities as the ultimate goal and all strategies geared to realize this ultimate objective (Ongore & Kusa, 2013). There have been a large number of empirical studies on commercial bank performance around the world (see Yeh, 1996; Webb, 2003; Laceywell, 2003; Halkos & Salamouris, 2004; Tarawneh, 2006). In most academic literatures, financial performance of banks has been measured by using individual indicator like return on assets (ROA) and return on equity (ROE) (see Kolapo et al. (2012), Warue (2013), Mensah and Adjei (2015). However, deposit liability of the banks is used in this study as performance measure.

Deposit liability of banks form the basis for the banks' operations. Where there are no deposit liabilities, banks cannot perform their functional activities let alone making profit. All measures of financial performance depend largely on the volume of deposit the banks can mobilize.

## **2.1 Empirical Review**

Ekpung, Udude and Uwalaka, (2015) examined the effect of monetary policy on banking sector performance in Nigeria. The study covered 36 years period of 1970 to 2006. Ordinary least square (OLS) regression technique was adopted. Deposit liabilities were used to represent performance while exchange rate, deposit rate and minimum discounting rate were used as proxies for monetary policy. The result of the study indicated that monetary policy has a significant effect on banks' deposit liabilities. It was concluded that monetary policy to a large extent determines the level of banks deposit liabilities. It was thereby recommended that government should provide a conducive environment for banks to grow in Nigeria.

Akomolafe et al, 2014 investigated the impact of monetary policy on commercial banks' performance in Nigeria. In their analysis, interest rate and money supply were used as surrogate for monetary policy, while profit before tax was used as proxy for commercial banks' performance. Pooled regression, fixed effect and random effect were used in the analysis. Fixed effect regression was found to be the appropriate model with the aid of Hausman test. The result revealed that there is a positive relationship between banks' profit and monetary policy. The study recommended that interest rate should be worked on to make it attractive to the investors.

Jegede (2014) examined the effect of monetary policy on commercial bank lending in Nigeria between 1988 and 2008. Variables used include exchange rate, interest rate, liquidity ratio and money supply as independent variables while loans and advances was used as dependent variable. Error correction mechanism of ordinary least square was adopted. The findings of the study indicated that long run relationship existed among the variables in the model. While exchange rate and interest rate were found to be statistically influenced commercial bank loans and advances, liquidity ratio and money supply exerted negative relationship with commercial bank lending. The study concluded that monetary policy instruments

were not effective to encourage commercial banks loans and advances in the long run. Indirect monetary instruments were thereby recommended by the study.

In the study of Afolabi, Adeyemi, Salawudeen and Fagbemi (2018), the relationship between monetary instruments and deposit money bank loan and advances was investigated. Data series sourced from Central Bank of Nigeria publications covering a period of thirty six years (1981-2016) were analyzed using Toda and Yamamoto non-causality model. It was found that structural changes in monetary policy affected loans and advances positively and significantly. It was also identified that monetary policy rate proved to be significant variable that causes deposit money bank loans and advances while other variables of monetary policy (broad money supply, liquidity ratio, inflation rate and cash reserve ratio) used in the study did not granger cause bank loans and advances within the period covered. Hence, it was recommended that monetary authority should strive to achieve stable interest rate in order to attract investors.

Ayub and Seyed (2016) examined the relationship between monetary policy and bank lending behaviour of eight banks listed on Tehran Stock Exchange in Iran. Aggregate bank loans, bank size, capital structure data and growth rate of M2 were used. Vector error correction model (VECM) was used to analyze quarterly data from first quarter of 2007 to fourth quarter of 2014. The result of the study indicated that bidirectional causal link existed between M2 and bank lending behaviour. Bank capital structure was found to impact bank lending negatively.

Uwazie and Aina (2015) carried out a study to investigate the cause and effect of monetary policy on commercial bank credit in Nigeria between 198 and 2013. Linear relationship model was specified among the variables- bank credit, broad money supply (M2), monetary policy rate, liquidity ratio, inflation rate and exchange rate. The result of the study revealed that a causal effect existed between monetary policy and commercial bank credit in Nigeria. Money supply was found to be a significant parameter which caused bank credit.

Nguyen, Vu and Le (2017) studied the impact of monetary policy on the profits of commercial banks in Vietnam. Panel data regression of fixed effect model was adopted to analyze collected data of twenty commercial banks operating in Vietnam between 2007 and 2014. Data collected include monetary base, discount rate, required reserve ratio and profit after tax of the banks. The result of the study indicated that positive relationship exists between monetary policy and commercial banks' profits. Although, only monetary base was found to be significant, hence the study recommended that monetary base should be more targeted by the monetary authority as tool of monetary policy to be used in Vietnam.

The impact of monetary policy instruments on banks performance was examined by Ajayi and Ayanda in 2012. The study covered a period of twenty nine years between 1980 and 2008. Bank rate, inflation rate, exchange rate, liquidity ratio cash reserve ratio and bank credit data were collected and analyzed with the use of Engle-granger two-step co-integration approach. The findings of the study revealed that bank rate, inflation rate and exchange rate raised credit while cash reserve ratio and liquidity ratio decreased credit. Meanwhile, only cash reserve ratio and exchange rate were found to be statistically significant. The study concluded that monetary policy instruments were not significant in enhancing credit in the long-run.

In a similar study, Agbonkhese and Aekome (2013) investigated the effect of monetary policy on credit creation by Nigerian deposit money banks. Ordinary least square (OLS) method of analysis was adopted to analyze series of data covering a period between 1980 and 2010. The findings of the study showed that a positive and direct relationship existed between total deposits and treasury bills rate. On the other hand, the reserve requirement and interest rate exerted negative effect on total credit creation by the banks. It was concluded that reserve requirement was not effective in regulating credit creation by deposit money banks in Nigeria within the period of the study.

In contrast, Olatu, Aladesanmi and Olufayo (2014) studied the impact of monetary policy on performance of commercial banks in Nigeria in terms of credit creation. Data on interest rate, money supply, liquidity ratio and cash reserve ratio were extracted and analyzed with regression analysis. The diagnostic result test indicated that all monetary variables (interest rate, money supply, liquidity ratio and cash reserve ratio) significantly influenced credit creation by commercial banks in Nigeria. It was concluded that money supply and cash reserve ratio were statistically influencing credit created by commercial banks in Nigeria.

The related studies reviewed above indicates that the relationship between monetary policy and bank performance remain inconclusive based on the results and conclusions of the empirical studies. This study will also join the recent work to determine to what extent has the monetary policy contributed to the performance of banks in Nigeria especially in the area of deposit mobilization.

### 3.0 RESEARCH METHODS

This study made use of secondary data for the period of 19 years (2000-2018) which were obtained from World Bank Publications and CBN publications.

### 3.1 MODEL SPECIFICATION

The data collected for this research work covers for the period of 19 years (2000 – 2018). For this purpose of this research work the researcher make use of interest rate, cash reserve ratio as explanatory variables and deposit liability as dependent variable. Thus, Adeusi, Kolapo, and Aluko, (2014) specify the following models to capture the hypothesized relationship as:

$$DL = f(INT, CRR) \tag{1}$$

The econometric model is given as

$$DL_t = \beta_0 + \beta_1 INT_t + \beta_2 CRR_t + \mu_t \tag{2}$$

Where:

*DL* = Deposit Liability of Commercial Banks

*INT* = Interest Rate

*CRR* = Cash Reserve Ratio

$\mu$  = Stochastic Error

Term

From above, equation (2) can be presented in an ARDL framework as follows:

$$DL_{t,t} = \beta_0 + \beta_1 INT_t + \beta_2 CRR_t + \sum_{i=1}^p \gamma_{1i} \Delta DL_{t-1} + \sum_{i=0}^q \gamma_{2i} \Delta INT_{t-1} + \sum_{i=0}^r \gamma_{3i} \Delta CRR_{t-1} + \mu_t \tag{3}$$

All variables are as defined above, p, q and r are the respective lags.

### 3.2 Estimation Technique

The adoption of ARDL modelling technique for this study is based on the merits which non-linear modelling techniques possess. Linear models are considered to be restrictive in dealing with the relationship between deposit liabilities of banks and cash reserve ratio as well as interest rate.

#### 4.0 RESULTS AND DISCUSSION OF FINDINGS

This part provides the presentation and interpretation of data. It covers the preliminary analysis of descriptive statistics, graphs, unit root and cointegration tests. It also includes the ARDL regression results.

Table 1 Descriptive Statistics

	DL (₦) billion	INT (%)	CRR (%)
Mean	5824.134	17.85105	11.17368
Median	5763.511	17.26	10
Maximum	14822.2	24.85	22.5
Minimum	343.1741	15.14	1
Std. Dev.	4939.242	2.100434	7.216327
Skewness	0.3901	2.066095	0.354749
Kurtosis	1.731045	7.669936	1.995129
Jarque-Bera	1.756676	30.78261	1.197914
Probability	0.415473	0	0.549384
Sum	110658.5	339.17	212.3
Sum Sq. Dev.	4.39E+08	79.41278	937.3568
Observations	19	19	19

Source: Author's Computations using Eviews 9 (2020)

The descriptive statistics is depicted in Table 1 below. Within the period under study, DL averaged about ₦5,824,134,000 while INT and CRR averaged about 17.85% and 11.17%. The standard deviation depicts the spread or dispersion of each variable around its mean. Of all variables, interest rate had the most spread while DL had the least spread. Skewness measures the asymmetry of the distribution of the series around its mean. A positive skewness means that the distribution has a long right tail and negative skewness implies that the distribution has a long left tail.

The skewness of a normal distribution is zero. All variables are positively skewed. Kurtosis measures the peakedness or flatness of the distribution of the series. For normal distribution the kurtosis is 3, but if it exceeds this value, the distribution is assumed to be peaked (leptokurtic) relative to the normal, but if it is less than 3, the distribution is flat (platykurtic) relative to the normal Distribution. DL and CRR are platykurtic while INT is leptokurtic.

The two tests of Skewness and Kurtosis however, are not individually sufficient in defining the distribution of the series, hence the need for Jarque-Bera normality test. Since the Jarque-Bera test combines skewness and kurtosis properties, it provides more comprehensive information. Following from the probability value of Jarque-Bera test, DL, INT and CRR are not normally distributed at 0.05% critical level.

#### 4.1 Unit Root Test

H<sub>0</sub>: The series has a unit root (not stationary)

H<sub>1</sub>: The series is stationary

The decision criteria for the hypothesis states that if computed probability value exceeds the chosen significance level (in this case, 5%), we fail to reject the null hypothesis (that is we accept H<sub>0</sub>), and if the computed probability value is less than the chosen level of significance, the null hypothesis is rejected.

The result shows that DL and CRR variables are non-stationary at level subject to first difference.  
Table 2 Unit root Test (ADF)

VARIABLE	LEVEL			FIRST DIFFERENCE			I(d)
	Trend	Trend and intercept	None	Trend	Trend and intercept	None	
DL	-3.040391 (0.9964)	-3.690814 (0.3906)	-1.961409 (0.9995)	-3.052169 (0.0027)*	-3.710482 (0.0029)*	-	I(1)
INT	-3.040391 (0.0471)**	-4.579551 (0.1003)	-1.961409 (0.0398)**	-	-	-	I(0)
CRR	-3.04018 (0.9294)	-3.69081 (0.8939)	-1.961409 (0.8643)	-3.052169 (0.0267)**	-	-	I(1)

Source: Author’s Computations using E-views 9

\*, \*\* and \*\*\* represents rejection of null hypothesis at 1%, 5% and 10% significance.

#### 4.2 Co-integration Test

Before proceeding to the estimation proper, there is need to determine if there is long-run relationship among the variables.

Hypothesis for Co-integration

H<sub>0</sub>: There is no co-integration among variables in the model

H<sub>1</sub>: There is presence of co-integration among variables in the model

The ARDL Bounds co-integration test result is presented in the table 4.3 below.

Table 3: ARDL Co-integration Bound Test

Dependent variable	Critical value	F-statistic = 7.629797	
		Lower bound	Upper bound
DL	10%	4.19	5.06
	5%	4.87	5.85
	1%	6.34	7.5

Source: Author’s computations using Eviews 9 (2020)

### 4.3 Model Estimation

This subsection presents the results of the Autoregressive Distributed Lag (ARDL) model. The use of ARDL was informed by the stationarity property of the variables. As the unit root tests in the previous subsection would suggest, the variables are all non-stationary processes hence the conventional OLS model could produce erroneous and spurious results.

Table 4: Results of Short-run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DL(-1)	0.192934	0.264827	0.728528	0.4848
DL(-2)	-0.630376***	0.285774	-2.20586	0.0548
CRR_____	217.2452*	65.43582	3.319973	0.0089
CRR_____(-1)	-218.9959**	83.99194	-2.60734	0.0284
CRR_____(-2)	109.5589	60.61291	1.807517	0.1041
INT_____	393.8586**	126.2451	3.119792	0.0123
C	-12601.79*	3421.323	-3.68331	0.005
@TREND	1283.44*	271.1406	4.733486	0.0011

\*, \*\*, \*\*\* represent 1%, 5% and 10% level of significance

Table 5: Results of Long-run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR	-0.082635	0.046251	-1.78666	0.1015
CRR	-0.044513*	0.009153	-4.86297	0.0005
C	8.202155*	1.045836	7.842677	0.0000
@TREND	0.222403*	0.021732	10.23387	0.0000

\*, \*\*, \*\*\* represents 1%, 5% and 10% level of significance

$$R^2 = 0.995116$$

$$F\text{-Statistic} = 377.3977$$

$$\text{Adjusted } R^2 = 0.992529$$

$$\text{Probability} = 0.0000$$

$$\text{Durbin Watson Statistic} = 1.970385$$

Source: Author's computations using Eviews 9 (2020)

The above ARDL result shows that in the short run, the two regressors are significant. They include CRR and INTR(-1). This simply implies that in the short run, movements in the one-period lag of Cash reserve ratio and movements in Interest rate are significant in explaining the dynamics of monetary policy effect with respect to the banking system in Nigeria. Judging from the sign of coefficients, INT rate one period has a positive effect on the banking performance while Cash reserve ratio has a positive effect (and negative effect in its lagged form) on deposit liabilities. In the Long run also, the cash reserve ratio is significant in explaining deposit liabilities in Nigeria banking industry. This is because its probability value fall short of the 0.05% critical level, therefore the null hypothesis of coefficient insignificance is rejected. Other variables are statistically insignificant at the 0.05% critical levels.



In summary, the determinants of the effects of monetary policy in the banking system in Nigeria can be categorised into both the short run and the long run. In the short run, the determinant of monetary policy on the banking system includes Deposit liability and interest rate. In the long run however, the determinants of monetary policy effect is limited to the Cash reserve ratio.

R<sup>2</sup> value of 0.995116 implies that about 99% of the total variations in Deposit liability in the banking sector in Nigeria is explained by the estimated model. This is a satisfactory goodness-of-fit because the higher the R<sup>2</sup>, the better the results. It is also vital to check that residuals are not serially correlated. The reported Durbin-Watson statistic informs that the error terms are serially and mutually uncorrelated, as its value lies around the threshold of 2.

Having adopted the ARDL for estimation, some major findings were made in this study, which include; some factors strongly determine Nigeria's bank performance and they include interest rate and cash reserve ratio; in the short run interest rate has a negative effect on bank performance and in the long run, cash reserve ratio has a negative effect on bank performance; while cash reserve ratio does not significantly affect bank performance in the short run it significantly affects bank performance in the long run.

## 5.0 Conclusion and Recommendations

Based on the above findings, the effect of interest rate on deposit liabilities does not persist even in the long run. Interest rate, being a very vital monetary policy variable in Nigeria, was shown to have significant effect on bank performance. The effect of cash reserve ratio on banks' deposit liabilities is also significant in both the short run and long run. The long run relationship (cointegration) which exists among the variables implies that these monetary policy variables will adjust to long-run equilibrium. The study recommends that government should ensure good and stable monetary policy through its monetary authorities such that deposit money banks' performance can be enhanced in Nigeria. The aim of every monetary policy introduced should be targeting soundness of the banking sector which will subsequently improve economic growth.

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