

# Shocks in Commercial Bank Performance to Interest Rate Deregulation in Nigeria

Titus Wuyah Yunana<sup>\*</sup>, Solomon Olubunmi, Muhammad Dahir Ahmad

Department of Economic and Management Science, Nigeria Police Academy, Wudil-Kano, Nigeria

## Abstract

The study analyzed the shocks in commercial banks performance to interest rate deregulation in Nigeria spanning the period 1986-2019<sup>9</sup>. The study used the Auto regressive Distributive lag Model (ARDL) estimated the equation after conducting stationarity test, co-integration, and normality test. The result of the unit root test reveals that SDR and TDR are non-stationary at level but becomes stationary after 1st difference while ROA and RTR are stationary at levels, implying that they are integrated of order zero. The findings also show that the calculated *Chi-square* value is 843.2 and is greater than all the Pesaran lower and upper bound limits at 1%, 5% and 10% respectively. Therefore, the negative hypothesis is rejected meaning that there is co-integration among the variables. Furthermore, the result shows that deregulated interest rate has a positive relationship on the commercial banks performance (asset) for the period of observation. Findings also reveal suggests that the estimated parameters for the study are stable for the period under study and are useful for policy decision. However, normality test failed with a low Jaque-Berra probability value less than 5%. Hence, the error residual of the data set is not normally distributed. The study therefore recommends that interest rate should be left in the invisible hands of Adam Smith (The forces of demand and supply of money) and not fixed by the Central Bank. Also, savings deposit rate should be high to encourage savings which improve positively the rate of returns on assets.

## Keywords

Interest Rate, Deregulation, Asset, ARDL, Commercial Bank

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## 1. Introduction

The price and allocation of goods and services are the underlying ideology of the deregulation of an economy where prices are gratuitously arbitrated in a competitive space [1]. The indication that often gives room for deregulation is the prevalence of supply and demand gaps in both the goods and labour markets [2]. In the financial market, the gap manifests itself in a saving investment imbalance, the prolonged existence of which is not conducive to long-term economic growth [3].

The cost of borrowing funds (Interest rate) has crucial role in any economy as the wrinkle that sways the waterway of funds.

The interest rate helps in moving the economy and adjusts the standard of living of its citizens [4]. Many governments in the world do not allow the forces of demand and supply to fix the cost of borrowing fund but rather used many tools and variables adjust the interest rate in the economy. Some of these tools adopted by the government in adjusting the interest rate are deregulations, regulation and guided regulation [5]. The state of the economy in relation to the economy of other nations with reference to monetary policy always remained the roadmap of fixing interest rate. According to Ibimodo [6] defined interest rate as the return for parting with liquidity by lender and rental payment for the use of credit by borrowers.

Under the regulated regime between 1970s and mid-1980s,

<sup>\*</sup> Corresponding author

E-mail address: [akuty02@gmail.com](mailto:akuty02@gmail.com) (T. W. Yunana)

the economy of this country observed immeasurable interest rate swings in different sectors of the economy [4]. In order to promote expanded investment level, interest rates were adjusted through the Adam Smith “invisible hand” [7]. Prior to the introduction of Structural Adjustment Programmes in 1986, the financial sector in Nigeria was distinctive by compulsory channelling of bank credit to private sector, control of interest rate, and unbendable exchange rate which technically results to low direct investment [8]. During the same period, funds were inadequate, the Nigeria currency was overvalued and there were slow movement of monetary and credit which affected the economy [9]. Government interference in financial system and the use of direct controls had led to improper allocation of resources and sticky competition that negatively affected the growth of the manufacturing sector and the economy at large [10].

The economy policy of deregulation of interest rate has to do with the complete removal of control and manipulation of interest rate by the government with the motive of allowing the “invisible hand” to determine the interest rate [4]. This policy was introduced to bring functional financial system through effective mobilization of local savings by banks and efficient channelling of resources for investment [11]. This policy of interest rate deregulation creates a better environment for competitive mobilization and utilization of fund in the financial system [12].

On these bases, the study examines the shocks commercial bank performance to interest rate deregulation in Nigeria. This paper have been structured into five sections: The first section is the general introduction of the study. The second section deals with the literature review of related studies and theory. Methodology of the study is in section three while section four covered the data presentation and analysis of results. The last is the conclusion and recommendations of the study.

## 2. Literature Review

### 2.1. Conceptual Review

#### *Interest Rate, Deregulation and Performance (Assets)*

Ibimodo [6] defined interest rate as the benefits for separating with cash by lender and outlay payment for the use of funds by borrowers. The length of time, maturity and conversion period for interest rate makes it different. Interest rate is the reward for not hoarding but for departing with liquid cash for a specific period of time [13]. Ojo [14] defined Economic Deregulation in the present context as the purposive and technical withdrawer of controls, operational structures and roadmaps which may have colonized expansion, competition and efficient resource allocation in an economy. Obadan and Ayodele [15] refer deregulation to the prominence given to the role of market

forces in resources allocation and mobilization. It was based on the assumption that the private sector was more efficient than public sector and the allocation of resources and prices should be adjudged by the freely interaction of market forces.

Ani [16] defined asset as valuable item that can be converted to another item. For instance, use your cash to buy a car or lent your house to make more money.

### 2.2. Theoretical Literature

#### *Classical Theory of Interest Rate*

This theory is linked to the studies of Ricardo [17], Marshall [18], and Pigou [19] etc. The theory says that what determined interest rate is the coming together of savings and investment schedule. In the same vein, rate of interest can be adjudged by equilibrium of investment and savings where perfect market exists. In this case, rate of interest is considered an equilibrium point that connects the quantity of savings and investment in any economy.

The negative relationship between rate of interest and the demand for capital explicates the reason for the demand curve for capital slopes downward from left to the right. On the other hand, the supply of capitalist any time relays on some factors which rate of interest is one? At higher rate, the public saves more which makes the supply curves of capital slopes downwards.

According to the classical economists, for savers to forego consumption, interest rate must be high. When the public saves less, capital supplied will be less than total demand which will stimulates rate of interest to raise high enough to compensate the saver.

### 2.3. Empirical Review

Onoh [20] examines the how interest rate deregulation affect the performance of banks in Nigeria spanning the period 1989-2017 using multiple regression models. The results show that rate of interest and bank performance moves in the same direction in Nigeria. The  $R^2$  which measure the contribution of the independent variables is 67%. The findings show that total assets have a long and short run equilibrium relationship with rate of interest rate, loans and advances and rate of inflation.

Emeka, Agok and Josephine [21] empirically examine the impact of rate of interest deregulation on Deposit Money Banks performance in Nigeria spanning the period 1986-2014 by adopting the ordinary least squared model. The results reveal that interest rate have positive impact on ROA and is statistically significant. It means that when interest rates increase, the ROA also increases. Inedu [22] examines the effect of interest rate deregulation on investment in Nigeria spanning the period 1970-2012. The study used Error Correction Model (ECM) for

analysis. The findings show that there is long-run equilibrium relationship among the variables under study. The result also indicated that all the variables have significant effect on investment. Maureen and Wambua [23] examine the determinants of interest rate spreads in Kenya's banking sector spanning the period 2002-2011 using both descriptive and regression analysis. The findings revealed that interest rate spreads is determined by bank-specific factors such as size of bank assets, liquidity risk, returns on average assets and credit risk as measured by non-performing loans to total loans ratio.

Nampewo [24] examines the determinants of interest rate spread in the Uganda banking sector for the period 1995-2010. The study applied the Engle and Granger two-step procedure. The findings show that the spreads in interest rate is positively influenced by bank rate, Treasury bill and non-performing loans.

Uzeru [25] analyzed the factors that impact on lending rate comprising 28 Ghana commercial banks using the average lending period 2005-2010. The study used correlative causal design and OLS regression models in analysis. The results show that increase in interest expense will results to increase in bank specific factors and lending rates.

Folawewo [26] studied the factors of interest rates spread in sub-Saharan African countries using a dynamic panel data analysis. The findings show that variation in interest rate spread is caused by many macroeconomic variables in the region.

#### 4.1. Presentation and Analysis of Results

**Table 1.** Unit Root Test of Stationarity.

Variables	ADF Levels	ADF Difference	PP Levels	PP Difference	Remarks
ROA	-4.781[ ]**	-----	-4.846[ ]**	-----	I (0)
RTR	-4.314[ ]**	-----	-4.502[ ]**	-----	I (0)
SDR	-0.021[ ]	-5.047[ ]**	-0.022[ ]	-5.019[ ]**	I (1)
TDR	-0.244[ ]	-6.031[ ]**	-0.244[ ]	-6.031[ ]**	I (1)

ADF 5% Critical Value = -2.96; PP 5% critical = -2.96

\*\* reveals significant level at 5%, [ ] Means that no lag length was included in the tests.

Source: E-view 9 Output

Table 1 shows the result of test of stationarity conducted with Augmented Dikey-Fuller (ADF) and Phillip-Perron (PP) unit root tests options. The tests were conducted with intercept included for all the variables. This is because when intercept was included in the test, it was found to be statistically significant for all variables. The result reveals that SDR and TDR are non-stationary at level because the ADF and the PP calculated values for the variables are less compared to the critical value at 5% level of significance. However, the variable becomes stationary after performing the 1st difference. But ROA and RTR are stationary at levels, implying that they are integrated of order zero. Therefore, since the variables are integrated of different order, the data

### 3. Methodology

#### Model Specification

In order to examine the shocks in commercial bank performance to interest rate deregulation in Nigeria, real interest rate, saving deposit rate and time deposit rate are the explanatory variables while return on asset is the dependent variable. The study uses time series data spanning the period 1986-2017 sourced from the Central Bank of Nigeria (2017). The econometric model is expressed as:

$$ROA_t = \alpha_0 + \alpha_1 RTR_t + \alpha_2 SDR_t + \alpha_3 TDR_t + \varepsilon_t \quad (1)$$

Where: Performance proxy by ROA = Return on Asset, RTR = Real Interest Rate, SDR = Savings Deposit Rate and TDR = Time Deposit Rate while  $\alpha_1 - \alpha_3$  = parameters

### 4. Discussion and Analysis of Results

The study analyses the data used in the study by carried out some diagnostic tests to check the quality of the data, whether or not they are normally distributed and F-bound co-integration test was then estimated. Also, ARDL models were estimated to analyze the dynamic interaction among the variables of the study.

set has met necessary condition for the use of ARDL model.

**Table 2.** Wald Test for Co-integration  $H_0$ : No Co-integration.

Test Statistic	Value	DF	P-Value
F-statistic	93.68	(9,227)	0.0000
Chi-square	843.2	9	0.0000
Pesaran Critical values	Lower bound		Upper bound
1.70	2.83		(10%)
2.47	3.18		(5%)
2.54	3.91		(1%)

Source: E-view 9 Output

The second table shows the result of the Wald test for co-integration. The test was conducted by using long-run

coefficient restrictions to compute the *Chi-square* statistic for determining the acceptance or rejection of the null hypothesis of no co-integration among the variables in the ARDL model. Table 2 shows that the calculated *Chi-square* value is 843.2

and is greater than all the Pesaran lower and upper bound limits at 1%, 5% and 10% respectively. Therefore, the negative hypothesis is rejected meaning that there is co-integration among the variables.

**Table 3.** Estimated Long-run Co-integration Coefficients of ARDL Model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RTR(-1)	-0.5913	0.0649	-9.1109	0.0000
SDR(-1)	0.2107	0.0439	4.7925	0.0001
TDR(-1)	-0.7431	0.4106	-1.8097	0.0819
C	-1.3223	1.3429	-0.9847	0.3338
R <sup>2</sup> =	0.6789	Mean Explanatory Variables =		80595
R <sup>2</sup> =	0.6172	S.D. Explanatory Variables		=29146

Source: E-views 9 Output

Table 3 shows the estimated result for short and long-run ARDL model. The test was conducted at lag one, which is the optimal lag decided by the Akaike information criteria. The results were extracted from the combined long-run and short-run estimates in which the long-run estimates were at levels. The long-run result shows that real interest rate (RTR) has inverse and significant impact of about 0.59% on commercial banks' return on asset (ROA). This means that ROA increases with a fall in interest rate. This agrees with *apriori* expectation. A fall in interest rate encourage investors to negotiate for more loans and as banks make more loan available to investors, they create more customers.

Unlike interest rate, savings deposit rate (SDR) has direct impact on ROA. The long-run result shows that a one per cent increase in SDR increases ROA by about 0.21%. However, time deposit rate (TDR) has a negative impact on return to asset. The long-run result shows that a 1% increase in TDR decreases ROA by about 0.74%. The negative impact of TDR on ROA may be attributed to the fact that banks pay higher interest on time deposits than on saving deposit.

**Table 4.** Results for Short-run ARDL Model.

Variable	Coefficient	Std. Error	t-Stat	Prob.
D(RTR)	-0.9399	0.10334	9.09502	0.0000
D(SDR)	0.7541	0.10336	7.29947	0.0000
D(TDR)	-0.1181	0.65935	-1.79151	0.0849
ECMt(-1)	-0.5896	0.15033	-3.92208	0.0020

Source: E-views 9 Output

Table 4 shows the result for short-run ARDL model estimated at first difference. The result reveals that the Error Correction Term (ECM (-1)) is negative, as expected, and is highly statistically significant. The negative sign implies that there is reconcile from short-run to long-run equilibrium among the variables of the study. That is, the banking sector responds to deviations from equilibrium such that if the short run variables (ROA, RTR, SDR and TDR) move away equilibrium, they serve to reconcile back to equilibrium in

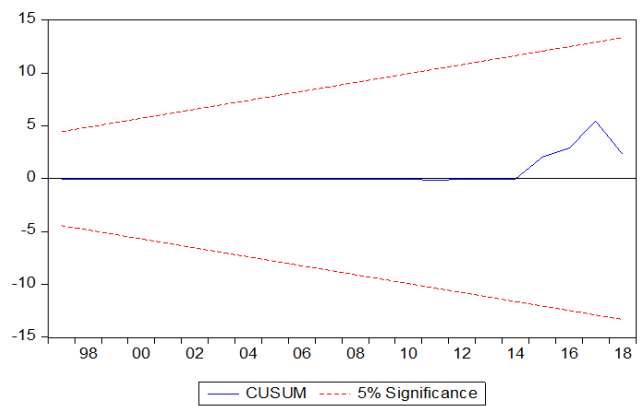
the long run. The coefficient of ECM(-1) reveals a yearly movement of reconcile of about 0.589% from long-run disequilibrium per perennial. This means that 59% of the error in loss of balance that took placed in the previous years is adjusted in the current year.

Furthermore, all the estimated short-run coefficients are statistically significant and have the expected signs. The result shows that 1% increase in RTR decreases the current ROA by about 0.94%. Similarly, 1% increase in SDR increase ROA by about 0.75%, 1%increases in TDR decreases ROA by about 0.12%. These results are in tandem with the result of long-run ARDL model, but differ only in the magnitudes of the estimated coefficients.

**Table 5.** Post-Estimation Statistic

Serial Correlation LM Test:			
F-stat.	2.679	Prob. F(2,24)	0.1231
Obs*R <sup>2</sup>	2.977	Prob. Chi-Square(2)	0.1210
Heteroskedasticity Test: ARCH			
F-stat	0.156	Prob. F(1,29)	0.6957
Obs*R <sup>2</sup>	0.165	Prob. Chi-Square(1)	0.6838

Source: E-views 9 Output



**Figure 1.** Stability Plot.

Source: E-views 9 Output

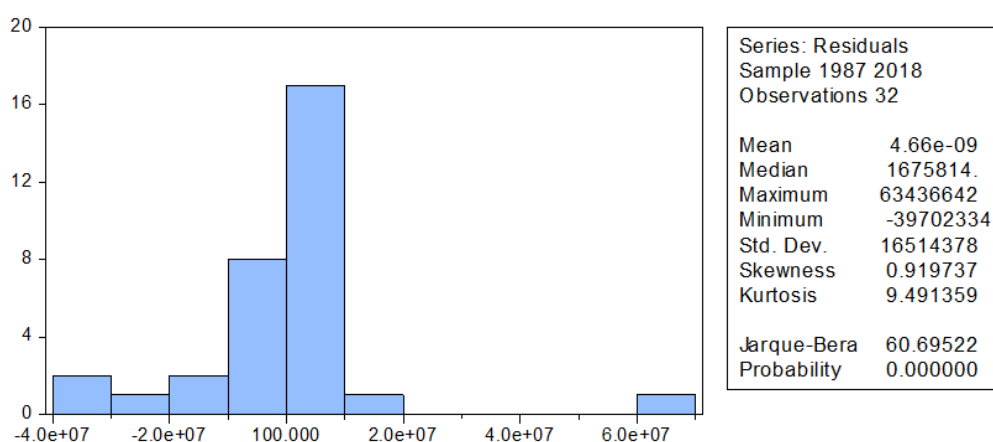


Figure 2. Normality Plot.

The above table shows the result of post-estimation statistics. The result of LM test of serial correlation in table 5 indicates the error residual of the data has no autocorrelation. This is because its estimated probability is 0.121. Hence, the negative hypothesis is accepted. Similarly, the result of ARCH test suggests that the series data are homoscedastic. In other word, the series data sets are free from the issues of heteroscedasticity.

The result of test of stability conducted to confirm whether or not the parameters of the model are stable across various sample data used in the study is reported in figure 1. The test used the cumulative sum of recursive residuals (CUSUM). It is clear that the CUSUM plots that the CUSUM trend does not crossed any of the 5% critical lines. This suggests that the estimated parameters for the study are stable for the period under study and are useful for policy decision. However, normality test failed as reported in figure 2 with a low Jaque-Berra probability value less than 5 per cent. Hence, the error residual of the data set is not normally distributed.

#### 4.2. Discussion of Findings

From the results estimated, real interest rate (RTR) has significant effect on commercial banks' asset proxy by return on asset (ROA) both in the long run and in the short-run. The ARDL estimates show that evidence. However, the effect of RTR on ROA seems to be higher in the short-run than in the long-run. The implication of this result is that in the era of deregulation, the effect of RTR on ROA is immediate and as time passes by, its effect on ROA gradually decreases.

Furthermore, savings deposit rate (SDR) has direct impact on ROA both in the short run and in the long run. The positive impact of SDR on ROA is about 0.21% in the long run but about 0.75% in the short-run. This means that the higher the saving deposit rate, the more the asset of the commercial banks and vice versa. However, time deposit rate (TDR) has a negative effect on return to asset. The long-run result shows that 1% increase in TDR decreases ROA by about 0.74%.

The negative impact of TDR on ROA may be attributed to the fact that banks pay higher interest on time deposits rate than on saving deposit rate. However, the estimated result is highly statistically significant. In addition, the co-integration test reveals that the variables have long-run association. Similarly, the error correction term in the short-run ARDL model is in line with the expected negative sign. This finding is in line with the works of Maureen and Wambua [23].

## 5. Conclusions and Recommendations

The study examined the shocks in commercial bank performance on interest rate deregulation in Nigeria. Based on the results and findings, the following conclusions are made: Interest rate under the guided deregulation has negative effect on return on asset. This mean that return on asset increases with a decrease in interest rate and vice versa. This conforms to economic theory. Therefore, it can be concluded that deregulated interest rate is a step forward to enhancing the banking industry of Nigeria and opening of Nigeria's financial system internationally. Furthermore, savings deposit rate (SDR) has positive impact on ROA both in the short run and in the long run, suggesting that the higher the saving deposit, the more the asset of the commercial banks and vice versa. However, time deposit rate (TDR) has a negative impact on return to asset. The negative impact of TDR on ROA may be attributed to the fact that banks pay higher interest on time deposits rate than on saving deposit rate. Therefore, the study concludes that while higher interest rate may be injurious to the banking sector, increasing demand deposit is necessary to improve the performance of the banking sector in Nigeria. On the basis of these findings, the study recommends that: Real interest rate should be encourage through reduction in monetary policy rate by the monetary authority so as to

boost savings and investment and increase the level of economic activities through return on asset of commercial banks in Nigeria, there is need for enlighten the public on the need to open savings account with commercial banks. The more the volume of saving deposits with commercial banks the more the banks will improve their return on asset and banks should expand their investment opportunity to increase their total asset turnover.

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