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Bank rates predictors and economic growth: Nigeria experience

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Abstract: The study examined the effect of bank rate predictors on Nigeria's economic growth from 1982 to 2022. The bank rate predictors considered are: saving rate (SIR), prime lending rate (PLM), maximum lending rate (MLR), treasury bill rate (TBR), and monetary policy rate (MPR), while economic growth was measured by real gross domestic product (RGDP). The data was collected from the Central Bank of Nigeria Bulletin. The sourced data were tested using auto-regressive distributed lag (ARDL) methodology. The study reported that SIR has p-values of 0.6722 and 0.7512 in the short and long term, respectively. SIR has no effect on RGDP in Nigeria in both periods, whereas PLM has p-values of 0.6620 and 0.6841 in both the short and long term. PLM has a minor effect on Nigeria's RGDP; MLR has p-values of 0.5528 and 0.5681 in both periods, respectively. MLR has no effect on Nigerian RGDP in both periods, whereas TBR has p-values of 0.4480 and 0.6987 in both the short and long runs. TBR has no significant effect on RGDP in Nigeria in both periods, but MPR has p-values of 0.2916 and 0.2024 in both the short and long runs. MPR has a negligible effect on RGDP in Nigeria in the short term. In light of the data, it is clear that the bank rate measures adopted had a minor influence on RGDP in Nigeria. It was discovered that SIR, PLR, MLR, TBR, and MPR have minimal effects on RGDP in both the short and long term in Nigeria. Hence, the government should utilize its monetary policies to influence interest rates in a way that prevents them from acting as a barrier to investment.

Keywords: *Bank interest, Deregulation, Economic growth, Rate.*

1. Introduction

Over time, the government of Nigeria has developed various interest rate programmes with the intention of encouraging the banking industry to engage the private sector more actively in the economy [1]. Since the deregulation of the Nigeria's interest rate in 1989, bank advances are mainly as a result of CBN initiatives [2]. Justifiably, even when banks rates are deregulated, bank rates are indirectly regulated by Nigerian banks. Specifically, both MPR and BLR are inter-related such that rise in MPR result to rise in BLR and vice versa [2]. By implication, if the CBN desires to curb excess money in circulation, CBN increases MPR which in turn increases borrowing costs and investments, as it becomes relatively expensive for businesses to borrow. Although, higher MPR reduces the borrowing capacity of the banking industry, it increases the propensity to save. By extension, higher MPR encourages savings by increasing savings rate but discourages consumption and investment by increasing borrowing costs BLR.

Okwuchukwu and Ariwa [3] noted that, bank rates are key monetary policy tools that the Nigerian government uses in attracting financial resources to support economic growth and development [4, 5]. Generally, bank rates encourage savings, reduces investment distortions, and also foster effective communication between savers and investors [3, 6]. Prior to bank rates, the CBN controlled INTRs

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movements directly. During this period, the CBN set both lending and deposit rates based on monetary policy thrusts and not based on the market demands [7]. The major approach which the Nigerian government adopted was to allocate financial resources at preferential rates to the selected sectors that were seen to be crucial for accelerating economic growth. These discounted prices frequently fell below the MRR. Contrarily, non-concessional rates were drawn by the non-priority sectors [8].

As opposed to McKinnon [9] and Shaw [10] viewpoints as mentioned in Alhassan, et al. [11] study, the preferential rates leads to financial repression due to the fact that a country's deposit or lending rates are below the inflation rate. Hence, for an economy to be relatively stable, the INTR in terms of deposit, lending, treasury bill and monetary policy rate that will encourage high economic growth must be advocated for [1, 12]. In a bid to achieve this strategic economic goal, the CBN, on July 31, 1987, deregulated INTRs with the sole aim of ensuring that the laws of demand and supply determines the INTRs. Evidently, the deregulated INTR helped investors, especially manufacturers by stimulating exports and correcting price distortion [11]. Since then various INTR policies has been implemented from INTR control regulation to deregulation [8, 11].

Alhassan, et al. [11] argued that the various policy reversals were due to an interest regulation claim of fluctuation and excessive rate. Evidently, the bank lending rate was 21% and the DER was 12% to 15%. In 1995, bank lending rates were governed by supply and demand for funds The CBN monetary policy committee has set rates based on economic performance since 2004. In 2013, the BLR was 17.10%, the MPR of 12%, and the deposit rates of 2.39% [13]. The inference that is drawn from the various analogies is that high borrowing cost discourages investment but high DER increases the propensity to save and invest. Thus, an economy's investment is linked to bank rate. As an extension to extant empirical discourse, the current study introduced MPR and treasury bill rate into the bank rate model.

2. Literature Review

The term bank rate" has been explained and defined in various contexts. It is simply a fee that is typically assessed on an amount of money lent to a borrower with the intent to return it later. Egbetunde, et al. [14] stressed that banks rates are derived by comparing the return received by lenders in exchange for their cash and the rental payments made by borrowers using credit. It can also be categorized according to loan and deposit rates, though. Prime and maximum lending rates are available to banks. The maximum lending rate is the amount that all other customers are charged, but the prime lending rate is the INTR that deposit financial institutions offer their most creditworthy clients, such as significant enterprises. Banks have developed a wide range of goods recently in an effort to outwit one another. Because of this, there are various savings rates. In Nigeria, the CBN has divided these deposit rates into four categories based on the length of the deposit [15]. These categories are: 3 months, 6 months, 1 year, and above 1 year deposit rates. Accordingly, there are four main categories of deposit rates in Nigeria, and the longer a customer's deposit is held by the bank, the greater bank rates that customer is eligible for. These prices may be controlled or uncontrolled. In the former, these rates are under the direct control of the CBN. That is, a system in which these authorities' expert recommendations and instructions serve as the basis for managing lending and deposit rates. For the latter, the situation is the opposite Alhassan, et al. [11]. Alhassan, et al. [11] explain that if the bank rates are deregulated, the forces of demand and supply determine the borrowing cost.

Economic growth (ECG) is related with population growth, resource development, technical innovation, and increased capital formation. Economic Growth is viewed as a rise in the country's GDP and per capita income [16]. A country's economic growth can be measured in terms of various objects. ECG could be considered to combine three progresses: capital accumulation, population increase, and labour force.

The Loanable Funds Theory (LFT) served as the main theoretical framework. The Swedish economist Bertil Ohlin and Dennis Robertson formed this theory in the 1930s [17, 18]. The theory's creators, according to Ohlin, were Swedish economist Knut Wicksell [19] and the economists Erik

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Lindahl and Gunnar Myrdal of the Stockholm school. Supply and demand for loanable funds have an impact on INTRs, according to the premise [2]. The sources of demand for loanable money are primarily the government, businesses, and consumers who require them for consumption, investment, and hoarding. The sources of supply for these funds are savings, dishonesty, and bank credits. The reason this theory is usually accepted as being better than the Classical theory is that it takes into account both real and monetary factors, recognizes that bank credits determine bank rates. In Ene [20] and Hansen [21] questioned this idea, arguing that it was too wide.

Empirically, Adebayo and Adofu [1] examined how deregulation impacted on Nigerian banks' credits from 1986 to 2019. The ARDL model indicated a little rise in loans and advances by Nigeria's bank NTR deregulation. Additionally, the country's loans and advances and deposit rate were inversely correlated by the policy. Again, Obagunwa and Akinwale [8] reported that bank credits is linked to high savings rates but lending rate does not determine bank credits

Alhassan, et al. [11] investigated on the impact of bank rate dispersion on the Ghana banks' profit base. They used the panel regression analysis spanning over 10 years with focus on 24 banks. They evidenced that high INTR dispersion improves bank profit base.

Using a panel regression approach, Akinkunmi [15] reported that total cost is positively and significantly impacted by bank output, input costs, and bank size; it is negatively and significantly impacted by regulation. This suggests higher costs for larger institutions.

3. Research Methodology

The research adopted is the *ex post facto* research design since the data on bank rates and economic growth are quantitative data, verifiable and occurred in retrospect. The study covered a studied periods of 41 years spanning from 1982 to 2022. The ARDL Methodology served as the anchor method of analysis. The central reason for choosing the ARDL methodology is that this methodology is robust, reliable, and valid as it offers flexible approach in modeling the relationships among variables of interest. More so, the ARDL methodology is appropriate for examining both short and long run dynamics especially for variables that integrate in both order 0 and 1 (mixed integration). Lastly, this method addresses complex macroeconomic issues.

To further ensure that the regression estimate is suitable, three (3) preliminary tests were conducted. First, the unit root test was conducted. Having attained that the variables attained mixed integration (i.e. stationary at level and first difference), the next stage is the test for cointegration using the ARDL Bounds Co-integration test. By implication, the mean value of interest rate drivers and economic growth are time invariant and their variance values are not determined by time but are determined by the time lag among the variables reviewed. As submitted by Agbogun, et al. [22]once variables attained mixed integration, Johanson cointegration is no longer suitable for the analysis. This test was introduced to test if the degree of cointegration among variables were determined the extent of long-run divergence (ECT). To properly capture the long-run divergence, the ARDL form of the model is expressed thus:

$$lnRGDP = \partial_0 + \partial_1 lnRGDP + \partial_2 SIR_{t-1} + \partial_3 PLM_{t-1} + \partial_4 MLR_{t-1} + \partial_5 TBR_{t-1} + \partial_6 MPR_{t-1} + \sum_{i=1}^{k} \gamma_1\, i\Delta lnRGDP_{t-1} + \sum_{i=1}^{k} \gamma_2\, i\Delta SIR_{t-1} + \sum_{i=1}^{k} \gamma_3\, i\Delta PLM_{t-1} + \sum_{i=1}^{k} \gamma_4\, i\Delta MLR_{t-1} + \sum_{i=1}^{k} \gamma_5\, i\Delta TBR_{t-1} + \sum_{i=1}^{k} \gamma_6\, i\Delta MPR_{t-1} + \varepsilon_t \quad (1)$$

K = ECM lag length
Δ = first Difference
ε = error term

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The co-integrating equation is specified as:

$$\Delta lnRGDP = \partial_0 + \partial_1 lnRGDP_{t-1} + \partial_2 SIR_{t-1} + \partial_3 PLM_{t-1} + \partial_4 MLR_{t-1} + \partial_5 TBR_{t-1} + \partial_6 MPR_{t-1} + \varepsilon_t \ (2).$$

The short-run (ECT) form is specified thus:

$$\Delta lnRGDP = \sum_{i=1}^{k} \gamma_1 \, ilnRGDP_{t-1} + \sum_{i=1}^{k} \gamma_2 \, iSIR_{t-1} + \sum_{i=1}^{k} \gamma_3 \, iPLM_{t-1} + \sum_{i=1}^{k} \gamma_4 \, iMLR_{t-1} + \sum_{i=1}^{k} \gamma_5 \, iTBR_{t-1} + \sum_{i=1}^{k} \gamma_6 \, iMPR_{t-1} + \varepsilon c_t \ (3)$$

Where;

εc_{t-1}= ECT for one year lag

^{y}= Speed of adjustment in equation (3)

4. Empirical Results

4.1. Summary Statistics

Table 1 present the outcome of the summary statistics:

Table 1.
Summary statistics.

	LRGDP	SIR	PLR	MLR	TBR	MPR
Mean	3.820118	1.821117	1.754214	1.955385	108.1676	5.548931
Median	3.915637	1.748421	1.739572	1.830460	111.9400	5.790325
Maximum	5.245699	3.624945	3.401800	3.777200	399.9600	6.765116
Minimum	2.143982	-1.045757	-1.154902	0.610660	0.610000	3.280965
Std. Dev. (SD)	1.057878	0.905727	0.708596	0.712092	109.9109	1.103244
Observations	41	41	41	41	41	41

Firstly, LRGDP reported an average value of 3.8201 though deviated by 1.0579 suggesting that LRGDP is consistent increase over time. Meanwhile, the least LRGDP value is 2.1440 while the highest LRGDP is 5.2457 respectively. Further, the average SIR value is 1.8201 but deviated by 0.9057 suggesting that SIR is relatively stable over the past 41 years.

Additionally, the minimum and maximum PLR values over the past 41 years are -1.0458 and 3.6249 respectively. Also, the average MLR over the past 41 years is 1.7542 though deviated by 0.7086 suggesting that MLR has been relatively stable over the past 41 years. Meanwhile, least and highest MLR value recorded was -1.1549 and 3.4018, respectively. Also, the average MLR values was 1.9554 but fluctuated by 0.7121 suggesting that MLR has not been stable over time. Furthermore, the least and highest TBR values are 0.6107 and 3.7772, respectively suggesting that the money market administrator has attracted much TBR to the country with their attractive policies.

Lastly, the average MPR value was 17.3102 though fluctuated by 4.6380 suggesting that MPR has been has rising. Meanwhile, the least and highest MPR values recorded are 7.7500 and 29.8000, respectively.

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Table 2.
Correlation matrix.

	LRGDP	SIR	PLR	MLR	TBR	MPR
LRGDP	1.000000					
SIR	0.619043	1.000000				
PLR	-0.203860	0.132075	1.000000			
MLR	0.556061	0.062890	0.145649	1.000000		
TBR	0.594117	0.026169	0.270869	0.079822	1.000000	
MPR	0.564016	0.097599	0.164149	0.046880	0.005387	1.000000

The correlation analysis as reported in Table 2 revealed that SIR, PLR, MLR, TBR and MPR exerted positive correlation with RGDP in Nigeria. Furthermore, SIR reported a coefficient value of 0.6190. By implication, SIR and RGDP are positively correlated. Generally, no multi-collinearity problem was anticipated since the correlation coefficients of SIR, PLR, MLR, TBR and MPR were lower than the bench mark of 0.7. Table 3 tested for Multicolinearity.

Table 3.
Multi-collinearity test.

Variables	VIF	TOV
LRGDP(-1)	1.46944	0.680531
SIR	2.69311	0.371318
PLR	1.46911	0.680685
MLR	3.26844	0.305956
TBR	2.55753	0.391003
MPR	2.22155	0.450136
Average	2.279863	0.479938

Note: VIF= Variance Inflation Factor & TOV= Tolerance Value

From Table 3, the TOV in the predictor variables SIR, PLR, MLR, TBR and MPR are above 0.10 in contrast to a VIF below 10 suggesting that the multi-collinearity problem is not present.

4.2. Data Validity Test

The validity test was carried out using the LM test and Heteroskedasticity Test as presented in Table 4.

Table 4a.
Breusch-Godfrey Test.

F-statistic	0.659180	Prob. F(2,22)	0.5272

Table 4 clearly shows that the model is reliable (p-value=0.5272).

Table 4b.
Heteroskedasticity Test.

F-statistic	0.604309	Prob. F(7,24)	0.7464

From Table 4b, the estimate confirmed that model is Homoskedastic, meaning that its variance is equal.

4.3. Unit Root Test

The purpose of this test is to prevent regression estimate that is spurious, which is a typical issue with dataset of this nature.

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Table 5.
Unit root test.

ADF test at Levels				
Parameter	**ADF test statistic**	**Test critical value @ 5%**	**Prob.***	**Decision**
RGDP	-1.394594	-2.936942	0.5753	Unit root does exist
SIR	-3.179039	-2.936942	0.0287	Stationary
PLR	-3.490626	-2.936942	0.0134	Stationary
MLR	-2.347446	-2.936942	0.1628	Unit root does exist
TBR	2.714122	-2.936942	0.1282	Unit root does exist
MPR	-1.848892	-2.967767	0.3506	Unit root does exist
ADF test at 1st Difference				
RGDP	-3.459534	-2.938987	0.0147	Stationary
SIR	-7.613470	-2.938987	0.0000	Stationary
PLR	-7.256590	-2.938987	0.0000	Stationary
MLR	-6.223257	-2.943427	0.0000	Stationary
TBR	-4.074471	-2.938987	0.0029	Stationary
MPR	-4.772206	-2.938987	0.3810	Stationary

The findings show that when tested at level, the ADF test statistics for SIR and PLR were above the test critical values suggesting that are stationary at level (i.e. stationary at order 0). However, the ADF test statistics for RGDP, MLR, and TBR were below their test critical values suggesting that were not stationary at order 0. When tested further, RGDP, MLR, and TBR attained stationarity at first differencing (1(1)).

4.4. ARDL Bound Test

The cointegration relationship between FPIIs and RGDP is presented in Table 4.7:

Table 6.
ARDL bounds test.

Test Statistic	**Value**	**K**	**Critical Value Bounds**		
			P-value	**Lower Bound**	**Upper Bound**
F-statistic	7.365808	6	5%	2.45	3.61

From Table 6, the F-statistic 7.3658 is above the upper bound value of 3.61 suggesting that the long run exist. By implication, bank rates improve ECG of Nigeria on the over time.

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Table 7.
ARDL estimate.

Regressed: LRGDP				
Selected Model: ARDL(1, 0, 0, 0, 0, 0, 0)				
Sample: 1982 2022				
Included observations: 32				
Cointegrating Form				
Variable	**Coef.**	**Std. error**	**t-statistic**	**Prob.**
D(SIR)	-0.005768	0.013465	-0.428394	0.6722
D(PLR)	-0.005720	0.012924	-0.442589	0.6620
D(MLR)	0.012995	0.021585	0.602026	0.5528
D(TBR)	-0.000191	0.000248	-0.771320	0.4480
D(MPR)	0.034638	0.032121	1.078338	0.2916
CointEq(-1)	0.035134	0.052866	0.664581	0.5127
Long Run Coefficients				
Variable	Corf.	Std. Error	t-Statistic	Prob.
D(SIR)	-0.164175	0.511801	-0.320778	0.7512
D(PLR)	-0.162802	0.395224	-0.411922	0.6841
D(MLR)	0.369857	0.638992	0.578814	0.5681
D(TBR)	-0.005444	0.013898	-0.391721	0.6987
D(MPR)	0.985876	0.752289	1.310503	0.2024
C	-1.964053	3.949078	-0.497345	0.6235

The cointeq-1is estimated at 0.0351, suggesting the model corrected its previous long run disequilibrium by 3.51% annually. The Durbin Watson Statistics (2.088414) confirmed that the model is reliable. The outcome in Table 7 demonstrated unequivocally that a unit increase in SIR will cut RGDP by -0.0058 and -0.1642 (0.58% and 16.42%) on a short- and long-term basis, respectively. This further shown that SIR has significant adverse short- and long-term effects on RGDP, and that these effects are likely to extend to Nigeria's RGDP. SIR failed to pass the test of statistical significance in terms of both short- and long-term results. This suggests that both in the short and long terms, SIR has little impact on RGDP. This aligns with Obagunwa and Akinwale [8] and Afzal, et al. [12] findings whom established insignificant effect coexistence between SIR and RGDP but contradicts the findings of Adebayo and Adofu [1] they established a significant effect coexistence between SIR and RGDP.

According to the study, PLR had a short- and long-term negative negligible impact on RGDP. The negative result implies that a 1% increase in PLR will reduce real gross domestic product (RGDP) by 0.0057 (0.57%) in the short run but by -0.1628 (16.28%) in the long run. To put it another way, the more PLR a country draws, the less favourable it may be in the long and short runs. However, at this time, the PLR are not statistically significant enough to have an impact on RGDP. Therefore, both in the short and long periods, PLR has little impact on RGDP. This aligns with Obagunwa and Akinwale [8] findings whom established an insignificant coexistence between PLR and RGDP but contrary to Adebayo and Adofu [1] findings, they established a significant coexistence between PLR and RGDP in Nigeria.

The result in table 7 demonstrated unequivocally that a unit increase in MLR will boost RGDP in Nigeria by 0.0130 (1.30%) in the short run and by 0.3699 (36.99%) in the long run. This further demonstrated that the possibility of a favourable impact on Nigeria's RGDP is higher the more MLR. The p-values of 0.5528 and 0.5681 shows that the MLR had minimal effect on RGDP. This aligns with Afzal, et al. [12] and Alhassan, et al. [11] findings that an insignificant coexistence between MLR and RGDP but contrary to the findings of Adebayo and Adofu [1] they established a significant coexistence between MLR and RGDP in Nigeria.

According to the analysis, TBR had a negative negligible effect on RGDP. The negative result implies that a 1% increase in TBR will reduce RGDP in the near and long terms by -0.0002 (0.02%) and -0.0054 (0.54%), respectively. To put it another way, the longer- and shorter-term effects will be negative the more the country's TBR climbs. With p-values of 0.4480 and 0.6987, respectively, it is clear

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that TBR are not statistically significant enough at this time to have an impact on RGDP in the medium or long term. Hence, we draw the conclusion that TBR has no appreciable effects on RGDP in both periods. This aligns with Afzal, et al. [12] and Alhassan, et al. [11] findings but contrary to the findings of Adebayo and Adofu [1].

The earlier tested regression result confirmed that MPR had both positive significant impact on RGDP in Nigeria in both periods. The favourable outcome is consistent with the study's initial expectations. The positive co-implications efficient imply that a 1% increase in MPR will raise Nigeria's RGDP by 0.0346 (3.46%) in the short term and 0.9859 (98.59%) in the long term. The p-values for MPR in the short and long runs, respectively, are 0.2916 and 0.2024, both of which are higher than 5%. Thus, we draw the conclusion that, both in the medium and long terms, TROP will positively but marginally affect Nigeria's RGDP. This aligns with Afzal, et al. [12] and Alhassan, et al. [11] findings but contradicts the findings of Adebayo and Adofu [1].

5. Concluding Remarks

It evident that bank rate predictors (SIR, PLR, MLR, TBR and MPR) had minimal effect on RGDP in both periods. Hence, the study concluded that bank rates have little effects on Nigerian economic growth over time. Consequently, the following practical recommendations were made:

1. Since the research evidenced that bank rates had no discernible impact on changes in investment in Nigeria, it is advised that the government refrain from allowing the rates to be set by supply and demand forces, as the liberalisation policy suggests. Instead, the government needs to use its monetary policies to affect rates in a way that prevents it from acting as a deterrent to investment. This is due to the fact that investors have long been extremely concerned about the high cost of borrowing.
2. In order to encourage investment growth, the CBN must address the issue of high lending rates as part of its stance on monetary policy by pursuing an aggressive monetary policy that would drive down lending rates to levels close to single-digit levels.
3. In addition, government spending should be planned and carried out in a manner that does not discourage investment but rather considerably raises the level of investment in the nation. One surefire method to achieve this is to make sure that more money is directed towards capital investments that will assist repair the deterioration in the vital facilities.
4. The Nigerian government must undertake policies and initiatives that would raise the level of national revenue.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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