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## EFFECTS OF INTEREST RATE DEREGULATION ON DEPOSIT MOBILIZATION IN THE NIGERIAN BANKING INDUSTRY

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### ABSTRACT

*This paper examines the effect of interest rate deregulation on deposit mobilization in the Nigerian Banking Industry. The study employed the ordinary least square method by using relevant data and information from 1993 to 2010. It was found out that real interest rate is a critical factor determining savings in the country. It was equally revealed that inflation has a negative effect on deposit mobilization while income was found to be the greatest determinant of saving and deposit mobilization. The study therefore recommends that there is an urgent need, for the government to review its interest rate policy and consistently pursue effective monetary policy and reforms aimed at enhancing the workings of this policy variable (interest rate). The study equally recommended a broad based main economic policy geared towards improved and sustainable income level, which has to be rigorously and persistently, pursued especially its economic and banking sector reforms.*

### KEYWORDS

Effect, Interest rate deregulation, Deposit mobilization and Nigerian Banking Industry.

### 1.0 INTRODUCTION

According to Soyibo and Olayiwola, the Nigerian economy witnessed financial repression in the early 1980s. There were rigid exchange and interest rate controls resulting in low direct investment. Funds were inadequate as there was a general lull in the economy. Monetary and credit aggregates moved rather sluggishly. Consequently, there was a persistent pressure on the financial sector, which in turn necessitated a liberalization of the financial system. The Nigerian government deregulated interest rate in 1987 as part of the Structural Adjustment Programme (SAP) policy package introduced in 1986. The official position then was that interest rate liberalization would among other things; enhance the provision of sufficient funds for investors, especially manufacturers, who are considered to be prime agents, and by implication, promoters of economic growth. However, in a dramatic policy reversal, the government in January, 1994 out-rightly introduced some measures of regulation into interest rate management. It was claimed that there were "wide variations and unnecessarily high interest rates" under the complete deregulation of interest rates (CBN, 2010) and Onwumere, et al. 2012).

The Central Bank of Nigeria embarked on liberalisation of interest rate and adopted the policy of making only its minimum rediscount rate to indicate the desired direction of interest rate. This was further modified in 1989, when the CBN issued further directives on the required spreads between deposit and lending rate. A maximum margin between individual bank average cost of fund and the maximum lending rate was prescribed in 1991. Another regulation came later in the year, which specified saving deposit rate and the maximum lending rate. The removal of the maximum lending rate ceiling in 1993 saw interest rates rising to high roof levels in sympathy with rising inflation rate, which rendered bank's high lending rates negative in real sense. A direct interest rate control was however restored in 1994. Because of the negative reactions to interest regulations instituted in 1995, total deregulation of interest rates was again adopted in the last quarter of 1996. All these have effects on volume of deposits in the system and interest rate on deposit impacts positively on the level of deposits being mobilised in the system (Siyanbola, Sobande and Adedeji, 2012)

However, experience has shown that government's intervention in the operation of financial market does not often achieve the intended policy or reform objectives. Instead, it results in distortion like suppression of equality markets and inducement of present consumption at the expense of savings. To remove or minimize these distortions, economist and financial experts called for the deregulation of financial system. Price distortion in the financial market is judged by how far the interest rate is negative in real terms i.e. disincentive to save and misallocation of funds or by excessive high value of interest in nominal terms i.e. discouragement to invest. (Agarwala, 1985).

The Nigerian government in 1986 adopted a comprehensive economic policy measure the Structural Adjustment Programme (SAP). One of its cardinal philosophies was comprehensive restructuring of the economy aimed at efficient mobilization and allocation of scarce resource through free operation of the market forces. An important element of SAP is the liberalization of interest rate and general banking structure.

Based on the afore-mentioned, the Central Bank of Nigeria (CBN) announced the deregulation of interest rate primarily as follows, effective from 1<sup>st</sup> August 1987; to

- a. Serve as incentive to savers and investors;
- b. Reduce capital flight and to some extent boost capital inflow;
- c. Allow for market forces of demand and supply to determine the rate of interest;
- d. Improving the overall economic efficiency by eliminating distortion and other restriction on capital movement (Oyejide 1996). It should be noted that, prior to the year of the adoption of SAP in 1986, interest rate were pegged and administered by the CBN as a matter of deliberate policy, even in the face of high inflation rate which persistently presented negative real rate of interest. This grossly discouraged savings mobilization and overall investment in the economy. The policy of interest rate deregulation was received with mixed feelings. The official view expressed was that, the interest rate deregulation **would** enable banks to compete for and raise their deposit liabilities in order to stimulate savings and consequently economic growth. It is against this background that this study seeks to examine the effect of interest rate deregulation on the deposit mobilization in the Nigerian Banking Industry. To this end, the paper is structured into four major parts. Section one is the Introduction, section two which follows this introduction present, the literature review and theoretical framework, section three discusses the methodology, while section four presents the conclusion and some recommendations.

## 2.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

### 2.1 CONCEPTUAL ISSUES ON INTEREST RATE

Interest rate can be defined as the return or yield on equity or opportunity cost of deferring current consumption to the future. Examples of interest rate are savings rate, discount rate lending rate and Treasury bill issue rate. The rate of return is sometimes associated with interest free banking. The basic difference between savings rate and rate of return on equity is that the future yield of the first type is known in the current period while for the other it is known when the investment matures (Khan, 1986).

Irving Fisher developed the idea of real interest rate when he tried to establish the trade-offs between consumption today and that in the future. The marginal rate that equilibrates the economic agent's time preference in the primary market {indifference to the consumption of a good today or to tomorrow} ability to borrow or lend is the real interest rate. Additionally, the real rate equals the rate that brings equilibrium in the primary market {new lending and borrowing} for new assets and the secondary market where old assets are traded.

In practice the form of interest rate observed and recorded in the economy is the normal interest rate, which incorporates monetary effects. Nominal interest rate is normally equal or greater than the real interest rates. Inflation, risk, taxes, government and institutional investment policy affect the difference between the two; assets market characteristics and investor preference as well as term of maturity.

### 2.2 PROFILE OF INTEREST IN NIGERIA

The Nigerian economy witnessed financial repression in the early 1980s. There were exchange and interest rate control resulting in low direct investments. Funds were inadequate as there was a general lull in the economy. Monetary and credit aggregates moved rather sluggishly. Consequently there was a persistent pressure on the financial system. In response to these developments, the government deregulated interest rates in 1987 as part of SAP policy package, the official position then was that interest rate liberalization would among other things enhance the provision of sufficient funds for investors especially manufacturers, who are considered to be the prime agent and by implication promotes economic growth.

Prior to introduction of SAP in 1986, the Nigerian financial system was tightly regulated. Thus, entry of institutions into the system was restricted and the main instruments are interest rates and rediscount rate. The rediscount rate is the rate at which the Central Bank (lender of last resort) is willing to provide loan accommodation to commercial and merchant banks remained relatively fixed in the period between 1970 and 1981 and was 4.5 percent from 1970 and 1975, while falling marginal in 1976 to 3.5 percent and it rose to 4 percent in 1977. This rate rose from 5% in 1978 to 10% in 1984. It remained at the level of 10% from 1984 to 1986 (see table 1).

However the CBN in 1987 liberalized interest rate and the minimum rate on savings and the time deposit were 12% while the Minimum Rediscount Rate (MRR) was 12.8% percent (See table 1). However, the associated high bank-lending rate attracted loud complaints from various sources. While analysts hinted at the possible adverse effects of high bank lending rate on cost of production.

Deregulation of interest rates however continued in 1989. During this period the banks remained free to set their deposit and lending rates. Therefore, government at that time embarked on ultra-restrictive monetary policies. The MRR was also raised from 12.8% to 18.5% by March 1989. Evidence also shows that between 1987 and 1991, government pursued a basically high interest rate policy. Available data revealed that during this period, the banks increased their interest rates on deposits and studies have also shown that this may have enabled them to mobilized savings for investment purposes. (Ndekwo; 1989, Soyibo and Adekanye; 1992).

The gap between saving-deposit rate and the maximum lending rate widened further in 1992. In fact the margin between the two rates reached a climax in 1992 when the spread was about 15.1%. Thus, interest rates regime of 1993 and 1994 discouraged investment in the productive sector while volatile inter-bank rates fuelled by many banks undermined the general stability in the financial system. The implication was the glaring failure of controls re-introduced during the period up to 1995. The controls also had negative economic effects and total deregulation of interest rates was again adopted in October 1996.

The margin between the two rates was relatively stable from 1994 to 1996 because of the change in interest rate regime from a deregulated interest rate regime to a guided deregulated regime. However, since 1997 the gap between the two rates continued to widen. For instance, the spread was as high as 20% in 1999 and 2000 respectively. These high interest rates induced high cost of inputs in the economy. In addition, the sector is believed to have been affected by the haphazard implementation of interest rate regulation, the continued prevalence of directed credit policies and in particular, the monetary authorities incessant use of stabilization securities in managing liquidity in the system (Sobodu and Akiode, 1995, Sobodu, 1996; and Osayameh, 1994). The spread between savings deposits rate and the maximum lending rate reduced to 20.3 percent in 2010.



TABLE 1: TREND IN INTEREST RATES IN NIGERIA (1970-2010)

Year	(1) Savings Deposit Rate (%)	(2) Maximum Lending Rate (%)	(3) Spread between (1) & (2)	(4) % Change in the spread	(5) Minimum Rediscount Rate (MRR) %	(6) Treasury Bills Rate (%)	(7) Treasury Certificate Rate (%)
1970	3.0	8.0	5.0	-	4.5	4.0	4.6
1971	3.0	10.0	7.0	40.0	4.5	4.0	4.6
1972	3.0	10.0	7.0	0	4.5	4.0	4.6
1973	3.0	10.0	7.0	0	4.5	4.0	4.6
1974	3.0	10.0	7.0	0	4.5	4.0	4.6
1975	4.0	9.0	5.0	28.6	4.5	3.5	4.6
1976	4.0	10.0	6.0	20.0	3.5	2.5	3.6
1977	4.0	6.0	2.0	66.7	4.0	3.0	3.6
1978	5.0	11.0	6.0	200.0	5.0	4.0	4.6
1979	5.0	11.0	6.0	0	5.0	4.0	4.6
1980	6.0	9.5	3.5	41.7	6.0	5.0	6.0
1981	6.0	10.0	4.0	14.3	6.0	5.0	6.0
1982	7.5	11.75	4.3	8.75	8.0	7.0	8.0
1983	7.5	11.50	4.0	8.0	8.0	7.0	8.0
1984	9.5	13.00	3.5	12.5	10.0	8.5	9.5
1985	9.5	11.75	2.3	34.3	10.0	8.5	9.5
1986	9.5	11.5	2.0	13.0	10.0	8.5	9.5
1987	12.0	19.20	3.5	75.0	12.8	11.5	12.8
1988	12.1	17.3	5.2	48.6	12.8	11.5	12.8
1989	16.5	25.7	9.2	76.9	18.5	17.5	18.5
1990	18.0	27.3	9.3	1.1	18.5	17.5	18.5
1991	13.8	20.7	6.9	25.8	14.5	15.5	15.5
1992	16.1	31.20	15.1	11.88	17.50	21.0	23.0
1993	16.7	36.09	1.6	89.3	26.0	26.9	27.0
1994	13.5	21.0	7.5	36.30	13.5	12.5	13.0
1995	12.6	20.79	8.2	9.2	13.5	12.5	13.5
1996	11.7	20.86	9.2	11.8	13.5	12.3	13.5
1997	4.8	23.32	18.5	102.1	13.5	12.0	-
1998	5.5	21.34	15.9	14.1	14.31	13.0	-
1999	5.7	27.19	20.0	25.8	18.0	17.0	-
2000	5.0	21.55	21.7	8.5	13.5	12.0	-
2001	5.5	21.34	15.84	27.0	14.31	13.0	-
2002	4.2	30.19	18.27	15.3	19.00	18.9	-
2003	4.1	22.88	18.4	0.7	15.75	15.0	-
2004	4.2	20.82	16.6		15.00	14.2	-
2005	3.8	19.49	15.7		13.00	7.0	-
2006	3.1	18.70	15.6		12.25	8.8	-
2007	3.6	18.36	14.8		8.75	6.9	-
2008	2.8	18.70	15.9		9.81	4.5	-
2009	2.9	22.90	20.0		7.44	1.3	-
2010	2.2	22.51	20.3		6.13	1.0	-

Source: Central Bank of Nigeria Statistical Bulletin Annual Reports Various Issues

### 2.3 TREND OF COMMERCIAL BANK DEPOSITS AND SAVINGS MOBILIZATION IN NIGERIA

The adoption of SAP in 1986 brought dramatic change in the financial system in +general and commercial banking in particular. Consequently, the banking environment became more competitive as a result of these developments. The banks therefore became more aggressive in their business because of the ensuring competitive environment. New product were introduced by the Commercial Banks, advertisement of services became more aggressive and price competition in term of differential interest payments on savings and lending was introduced.

Generally, Commercial Banking became more creative than before. But of course, profitability and liquidity remained the dominant philosophy of banks. Also, in spite of the financial distress in the Banking System, the amount of deposit mobilized from the economy continued to increase.

TABLE 2: COMMERCIAL BANK DEPOSITS (1970-2010) N million

Year	Demand Deposit	Savings Deposit	Time Deposits	Foreign exchange	Total deposit
1970	288.1	207.0	129.7	-	624.8
1971	285.3	211.4	160.4	-	657.1
1972	336.9	255.9	200.9	-	793.7
1973	430.7	357.8	224.5	-	1013.0
1974	720.7	686.5	286.7	-	1693.9
1975	1266.8	1051.1	521.3	-	2839.2
1976	2185.2	1270.0	709.2	-	4164.4
1977	2980.1	1325.0	930.1	-	5235.2
1978	2700.9	1526.0	1075.7	-	5302.6
1979	3265.7	2418.3	2418.3	-	6967.8
1980	4845.9	3573.7	1589.5	-	10009.1
1981	4880.9	1979.2	3816.8	-	10676.9
1982	5180.7	2321.2	4517.0	-	12018.9
1983	5855.6	2879.3	5203.6	-	13938.5
1984	6343.5	3361.3	6030.0	-	15734.8
1985	7046.2	3699.9	6851.0	-	17597.1
1986	6649.8	4270.2	7217.6	-	18137.6
1987	7998.0	5206.7	9882.0	-	23086.7
1988	10667.7	7122.7	11274.5	-	29065.1
1989	10188.0	9237.8	7739.1	-	27164.9
1990	15588.8	13073.5	10175.0	-	38777.3
1991	22049.0	19395.3	10964.4	-	55208.7
1992	33263.5	26071.1	15713.1	-	75047.7
1993	49923.6	37091.8	23475.2	-	110453.6
1994	65348.7	49601.1	25889.5	1698.2	142537.5
1995	79469.4	62135.0	29965.4	7392.3	198962.1
1996	95904	68776.9	43999.8	5679.1	214359.8
1997	133335.9	84099.5	52076.2	5507.6	280,028.7
1998	142252.1	101373.5	61263.2	9414.7	314303.5
1999	202152.1	128365.8	110765.1	35067.9	476350.9
2000	345001.4	164624.2	154406.0	38072.9	651222.3
2001	448021.4	216509.4	235453.7	47198.4	734842.5
2002	503870.4	244064.1	300140.1	109037.0	954628.5
2003	577663.7	312368.9	324676.4	122587.2	1446344.3
2004	728552.0	359311.2	401080.6	172538.3	1661482.1
2005	946639.6	401986.8	498952.4	188511.1	2036089.9
2006	1497903.7	592514.8	852358.0	302380.0	3245156.5
2007	2307916.2	753868.8	1465281.5	474404.1	5001470.6
2008	3650643.9	1091812.2	2293605.8	924105.0	7960166.9
2009	3447099.9	1169543.1	2323644.6	214653.1	7154940.7
2010	3679093.6	1371283.6	3090557.3	1465667.3	9606601.8

Source: Central Bank of Nigeria Statistical Bulletin Annual Reports Various Issues

As shown in table 2, the phenomenal growth in the amount of savings mobilized is instructive of the expected contributions of the savings institutions to the economy. The growth in the absolute size of total deposit mobilized by Commercial Banks has been tremendous.

Table 3 below shows that Nigeria's real domestic savings have been low and inadequate to sustain the level of investment that is consistent with the country's economic growth targets and potential. The savings rate rose consistently from 17.3 percent in 1970 to 35.7% in 1974 because of the improvements in economic activities. Therefore, the performance of the savings rate was very dismal (see table 3). In fact, between 1981 and 1984, it continuously decelerated, perhaps, due to the serious economic recession of the time. The same experience was recorded between 1992 and 1995 partly as a result of other indices of macroeconomic instability in the system e.g. inflation.

TABLE 3: NIGERIA'S SAVINGS GROWTH TREND

Year	Real GDP Growth Rate	Gross National Savings (% Share of GDP)
1970	-	17.3
1971	21.3	21.0
1972	5.5	2.8
1973	6.4	30.3
1974	11.7	35.7
1975	-3.0	27.1
1976	11.1	31.8
1977	8.2	30.5
1978	-7.4	18.7
1979	9.4	24.5
1980	4.1	25.9
1981	-2.6	18.8
1982	-0.3	12.3
1983	-5.4	9.3
1984	-5.1	9.3
1985	5.9	11.0
1986	2.2	4.4
1987	-0.3	9.3
1988	7.0	6.1
1989	7.3	11.7
1990	8.2	14.5
1991	4.8	22.3
1992	3.0	13.4
1993	2.1	8.8
1994	1.3	3.6
1995	2.2	3.6
1996	3.4	13.2
1997	3.2	11.1
1998	2.4	9.9
1999	2.8	18.3
2000	5.4	12.3
2001	4.6	11.3
2002	3.5	15.6
2003	10.2	13.6
2004	10.6	28.9
2005	5.4	29.3
2006	6.2	49.2
2007	7.0	41.6
2008	6.0	39.8
2009	7.0	40.9
2010	8.7	31.1

Source: Compiled from CBN Annual Reports and Statement of Account and Statistical Bulletin, Various issues.

#### 2.4 THE LINK BETWEEN INTEREST RATES DEREGULATION AND DEPOSIT MOBILIZATION: EVIDENCE FROM NIGERIA AND OTHER COUNTRIES

In most countries, the withdrawal by the monetary authorities from a direct determination of lending and deposit rates was the major reform in the financial sector. Thus, banks were expected to set lending and deposit rates in response to credit supply and demand conditions. While the process of interest rate liberalization varied considerably among countries in terms of aspect and degree, the outcomes were not too different (Soyibo/Adekanye, 1992).

Using cross-country analysis, Robert King and Ross Levine (1993) found a significant, robust and positive correlation between higher levels of financial development and faster growth, physical capital accumulation and economic efficiency. Alan Gelb found a positive correlation between real interest (used as proxy for financial intermediation) and growth for 34 countries for the period 1965-1985, while Jose De Gregerio and Rablo Guidotti reported a positive relationship between credit to the private sector and the growth for a sample of 98 countries for 1960-1985s and 1960s.

However, their regression for 12 Latin American countries for 1950-1985 found that credit had a significant negative correlation with growth. The correlation was not significant in the 1950s and 1960s but became strongly negative in the 1970s and 1980s.

The literature on correlation between financial liberalization and saving is equally ambiguous with contradictory evidences. Nureddein Hussain in his own research maintained that, in the three years following liberalization, financial savings in Egypt increased by 6% of GDP over the level that would have occurred in the absence of financial liberalization. On the other hand, Tamim Bayomi (1991) finds that both household and corporate savings rate has fallen steadily since the 1980 deregulation in the same United Kingdom around the same time.

Uygun in his own personal research found that econometric estimates of determinants of the ratio of private savings to disposable income in Turkey from 1971 to 1990 indicate that a negative income effect from higher interest rates off sets or exceeds the positive substitution effect of the private savings ratio. There is also evidence of lower savings rate following liberalization in Argentina Colombia and Philippines.

Three separate studies by Lopez-Meya, Bayomi and Darby and Ireland show that financial liberalization resulted in a consumption boom in the United Kingdom in the late 1980s. Studies by John Harris Fabio Schiaterelli and Miranda Siregar found that, after liberalization, the more technologically the efficient firm, the greater the proportion of new credit it received. For Korea, Atiyas (1992) presents evidence start small firms gained improved access to external finance after liberalization. Credit flows moved from light industrial manufacturing to services utilities and construction. In a similar study Gastin Gelos (1977) provides econometric evidence that financial constraints were eased for small firms in Mexican manufacturing sector following financial liberalization.

Soyibo and Adekanye (1992) examined the Nigerian Banking System in the conduct of policies of financial regulation and deregulations. They argued that policy of financial liberalization has changed the face of the Nigerian Banking System. They established that there is a positive relationship between savings mobilization and financial liberalization in Nigeria. They concluded that the apparent decline in some indices of financial liberalization in Nigeria. They concluded that the apparent decline in some indices of financial liberalization during the era of relaxed control/deregulation is due mainly to conflict of policies rather than the policy of liberalization perse.

**2.5 THEORETICAL FRAMEWORK**

The classic McKinnon-Shaw thesis which in principle, is a repudiation of the mainstream theoretical postulate of negative correlation between real interest rate and investments also contends that high real interest rate relative to the marginal productivity of capital will raise the volume of both real and financial savings. However, empirical evidence fails to authenticate this relationship. To paraphrase, Schmidt Hebbel and Serven (1996) "financial liberalization and interest rate deregulation often as part of structural adjustment programme have had very little effect on improving the size and allocation of savings".

Using a theoretical model and comparative static, Molho (1986) investigated the Mckinnon-Shaw Hypothesis that high real deposit rates encourage savings accumulation which will encourage investment from own sources (McKinnon) and external borrowing (Shaw). He specified an aggregate saving function of the form.

$$S_t = f(rdt, rkt, Lt, rd_{t-1}, rk_{t+1})$$

Where

- rd = Deposit rate
- rk = Rate of return on capital
- L = Stock supply of loans
- K = Capital formation

Applying partial derivatives on the aggregate savings function, he concluded that the effects of future rate of return on capital and current deposit rate on savings are in determinant while past deposit rate and current supply of loans negatively affect current savings. He also assumed a positive relationship between the stock of deposits and the supply of loans.

Riechel (1991) while investigating the empirical relationship between the real interest rate and savings in Nigeria specified the following models.

First, he specified that gross domestic savings is a function of real interest rate which is stated as:

$$S/Y = f(r) \dots\dots\dots(i)$$

Secondly, he accounted for Keynesian absolute income hypothesis by including real income index Y, to obtain

$$S/Y = f(r) \dots\dots\dots(ii)$$

Hence gross savings rate specification by including last period's gross savings rate due to adjustment of lags gives

$$S/Y = f(y; r, s/y_{t-1}) \dots\dots\dots(iii)$$

Reichel (1991) regressed real growth rate of time and savings deposits (grts) on real interest per capita real income (y) and real interest rate, taking into account the transitory income.

The following equations resulted grts- f(r) .....(iv)

$$grts = f(y, r) \dots\dots\dots(v)$$

$$grts = f(y, r, D) \dots\dots\dots(vi)$$

His regression results showed a positive relationship between gross domestic savings and financial savings and that output is significantly and positively related to gross domestic savings but only positively related to financial savings. Under the assumption that Gross Domestic Savings (GDS) is a residual from the agricultural, industrial, mining, and petroleum, retail trade and other sectors of the economy and that GDS is affected by economic activities, GDP, opportunity cost of deferring present consumption to the future represented by real savings rate (RSR) and the complementary effect of foreign savings (Fs), then

$$GDS = f(GDP, RSR, FS) \dots\dots\dots(viii)$$

$$\text{Where } \frac{dGDS}{dGDP} > 0, \frac{dGDS}{dRSR} > 0, \frac{dGDS}{dFS} > 0 \dots\dots\dots(ix)$$

Hence the financial saving rate according to Uchendu (1974) is given by

$$\frac{dTFS}{dGDP} = f(SR) \dots\dots\dots(x)$$

dGDP

Where TFS = Total financial savings and

SR = Nominal saving rate.

$$\frac{dTFS}{dSR} > 0$$

dSR

Uchendus findings showed that:

- i. Nominal savings interest rate is the main determinant of financial savings in Nigeria
- ii. Gross national savings is positively and significantly explained by real savings rate and other variables.
- iii. Financial savings explained 98.3% of the variation in bank loans and advances

**3.0 METHODOLOGY**

**3.1 MODEL SPECIFICATION**

We formulated model suitable for this study by adopting and modifying Uchendu's models as follows:

$$GDS = f(RSR) \dots\dots\dots(1)$$

$$GDS = f(RLR) \dots\dots\dots(2)$$

$$GDS = f(NSR) \dots\dots\dots(3)$$

$$GDS = f(NLR) \dots\dots\dots(4)$$

$$GDS = f(INF) \dots\dots\dots(5)$$

$$GDS = f(RGDP) \dots\dots\dots(6)$$

$$GDS = f(NGDP) \dots\dots\dots(7)$$

$$GDS = f(RSR, RLR, INF, RGDP) \dots\dots\dots(8)$$

$$GDS = f(NSR, NLR, INF, NGDP) \dots\dots\dots(9)$$

Where GDS - Gross Domestic Savings

- RSR = Real Savings Rate
- RLR = Real Lending Rate
- NSR = Nominal Savings Rate
- NLR = Nominal Lending Rate
- INF = Inflation Rate
- RGDP = Real Gross Domestic Product (Real Income)
- NGDP = Nominal Gross Domestic Product (Nominal Income)

**4.0 RESULTS AND DISCUSSION**

The linear equation obtained from the first model is

$$GDS = 356295.7 + 17509.82RSR$$

$$T - Stat: (2.195) \quad 2.741$$

$$R - squared = 0.47 \quad DW = 1.20$$

This implies that savings rate has a statistically significant positive effect on gross domestic savings as anticipated. The coefficient of determination,  $R^2$  is approximately, 47% which implies that real saving rate explain 47% of the total variation in gross domestic savings in Nigeria.

From the third model, we obtained

$$GDS = 315022.5 + 14872.19 \text{ RLR}$$

$$T\text{-stat: } (2.518) \quad (2.363)$$

$$R\text{-squared} = 0.43, \text{ D.W.} = 1.35$$

This shows that real lending has a statistically significant positive effect on gross domestic savings. This is contrary to the apriori expectation. The explanatory power of the model is fair judging by the coefficient of determination of  $R^2$  which is 43%.

The relationship between gross domestic savings and nominal savings rate is expressed by the linear equation form:

$$GDS = 812695.9 - 50109.45 \text{ NSR}$$

$$T\text{-Stat: } (3.149) \quad (-2286)$$

$$R\text{-squared} = 0.45, \text{ D.W.} = 1.58$$

This indicated that nominal savings rate has a statistically significant negative effect on gross domestic savings as expected. The  $R^2$  is fair showing that nominal savings rate explains approximately 45% of the total variation in gross domestic savings.

The equation below specifies the relationship between gross domestic savings and the nominal lending rate:

$$GDS = 1.776 + 4.093 \text{ NLR}$$

$$T\text{-Stat: } (0.3) \quad (2,059)$$

$$R\text{-squared} = 0.35 \quad \text{D.W.} = 0.48$$

This indicated that nominal savings rate has a statistically significant positive association with gross domestic savings as expected by the apriori expectation. The coefficient of determination ( $R^2$ ) of the model reveals that a nominal lending rate explains 35% of the total variation in gross domestic savings in Nigeria within the period of the study.

The relationship between Gross Domestic Savings and Inflation Rate is expressed in linear form as:

$$GDS = 463008.6 - 7186.61 \text{ INF}$$

$$T\text{-stat: } (2.364) \quad (-1.196)$$

$$R\text{-squared} = 0.08, \text{ D.W.} = 1.29$$

From the above results there was a statistically insignificant negative relationship between inflation rate and gross domestic savings. This was consistent with the apriori expectation. The coefficient of determination ( $R^2$ ) reveals that inflation rate approximately explains 8% of the total variation in gross domestic savings.

The relationship between the Gross Domestic Savings and the real Gross Domestic Product is presented linearly as thus:

$$GDS = 11018320.0 + 22.4435 \text{ RGDP}$$

$$T\text{-stat: } (-1.775) \quad (4.266)$$

$$R\text{-squared} = 0.64, \text{ D.W.} = 1.53$$

This shows that real income has a statistically significant positive effect on gross domestic savings. This finding conforms with the apriori expectation. This explanatory power of the model is high judging by the coefficient of  $R^2$  of 64%. This implies that real income explains 64% of the variation in the gross domestic savings.

The equation below expresses the regression results of the relationship between gross domestic savings and nominal gross domestic product:

$$GDS = 15.6370 + 1.4905 \text{ NGDP} - 0.9384 \text{ INF} + 25177 \text{ NLR} + 0.6956 \text{ NSR}$$

$$T\text{-stat: } (-3.347) \quad (4.628) \quad (2.728) \quad (2.476) \quad (0.743)$$

$$R\text{-squared} = 0.91, \text{ R}^2 = 0.87, \text{ F-stat} = 77.02, \text{ DW} = 3.18$$

The estimations above shows the aggregative effects of nominal income, nominal lending rate, inflation and nominal savings rate on gross domestic savings. It was found that nominal income lending rate have statistically significant positive effects on gross domestic savings, although a negative association was anticipated between real lending rate and gross domestic savings. More so, real saving rate has a statistically significant negative effect on savings though a positive relationship was expected. It should be noted that inflation has a negative relationship with domestic savings. The adjudged  $R^2$  suggests that the four exogenous variables explain 86% of the total variation in gross domestic savings. The F-statistic indicates that the model is statistically significant.

The result obtained above is inconsistent with that of Khathate (1988) but corroborates Riechel (1991) who investigated the empirical relationship between real interest rate and savings in Nigeria. The result is also in lien with that of Soyibo and Adekanye (1991) who tested the determinant of savings in Nigeria using variants of fry (1978), MFM, Yusuf and Peters (1984) MYMP, and Leite and Mokannen (1986). MLM models. The empirical evidence suggesting the negative effect of inflation on deposit mobilization in Nigeria is also consistent with the empirical findings of Adeoye (2003) who examined the determinant of credit flow from the Nigerian Banking Industry.

## 5.0 CONCLUSION AND RECOMMENDATIONS

The empirical results generated in the analyses above show that real interest rates is a critical factor determining behaviour of savings in Nigeria. Also, inflation was found to be depressing the aggregate level of savings in the country as high inflation rate is unhealthy for effective savings mobilization. The study equally found out that savings mobilized is strongly influenced by the level of income in the country.

The general conclusion that emerges from the theoretical and empirical analysis of the effect of interest rate deregulation on savings mobilization in the banking system is that interest rate policy in the country has performed fairly in the area of mobilizing sustainable deposit from the domestic economy.

That is, going by the results of the regression analysis carried out, the major determinants of savings in Nigeria are interest and level of real income.

Following from our study, the need to review interest rate policy is inevitable. Among the policy recommendations emanating from the study include:

- i) Effective monetary policy should be designed to enhance the working of the policy variable of this study (i.e. interest rate) which should be consistently and rigorously pursued;
- ii) Income as a good determinant of savings in Nigeria requires a broad-based macro economic policy geared towards improved and sustainable income level necessary to motivate domestic savings.
- iii) Since negative association is obtained between inflation and savings, it follows that, complementary fiscal and monetary policy that will ensure a moderate inflation rate should be of policy priority to the relevant authorities in view of the negative effect of inflation on savings.
- iv) The review of the income of workers under the new reform is a welcome idea, which if carried out by all tiers of government will not only improve the welfare of Nigerian workers but also improve the level of savings necessary for investment in the economy. This will promote growth and sustainable development.

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APPENDIXES

TABLE 4

OBS	C	GDS	INF	NGDP	NLR	NSR
1993	1.00000	1494.700	5.400000	71859.00	10.50000	9.500000
1994	1.00000	3573.700	10.20000	108183.0	17.50000	14.00000
1995	1.00000	361.1000	38.30000	142618.0	16.50000	14.50000
1996	1.00000	48586.90	40.90000	220200.0	26.80000	16.40000
1997	1.00000	61785.20	7.500000	271908.0	25.01000	18.80000
1998	1.00000	56601.60	13.00000	316670.0	20.01000	14.29000
1999	1.00000	57119.10	44.50000	536305.1	29.80000	16.10000
2000	1.00000	63408.90	57.20000	688136.6	36.09000	16.66000
2001	1.00000	58987.70	57.00000	904004.7	21.00000	13.50000
2002	1.00000	173984.1	.30000	1934831.	20.18000	12.61000
2003	1.00000	114411.4	.30000	2703809.	19.74000	11.69000
2004	1.00000	215394.9	.30000	2801973.	13.54000	4.800000
2005	1.00000	-168126.1	.30000	2721178.	20.46000	5.750000
2006	1.00000	942399.5	.30000	3313563.	21.3200	5.330000
2007	1.00000	2036352	.30000	4727523.	21.33000	4.880000
2008	1.00000	740593.1	.30000	5374335.	26.00000	5.000000
2009	1.00000	-71517.70	.30000	6232244.	20.60000	3.700000
2010	1.00000	736740.0	.30000	6061700.	19.60000	3.200000

OBS	RESID	RGDP	RLR	RSR
1993	-0.828536	71075.90	5.100000	
1994	0.380915	70740.60	7.300000	
1995	-2121507	77752.30	-21.80000	
1996	1.504384	83495.00	-14.10000	
1997	0.770618	90342.00	18.00000	
1998	0.596956	94614.10	7.010000	
1999	0.047050	97431.40	-14.70000	
2000	-0.607828	100015.2	-21.11000	
2001	0.136894	101330.0	-36.00000	
2002	0.871501	103510.0	52.62000	
2003	0.298048	107020.0	-9.560000	
2004	-0.094948	110400.0	5.040000	
2005	NA	112950.0	10.46000	
2006	0.168667	116400.0	14.72000	
2007	0.572217	121207.8	14.43000	
2008	-0.616122	126323.8	7.100000	
2009	NA	131489.8	-7.700000	-9.200000
2010	-1.078309	136470.0	5.600000	-10.80000

Dependent Variables GDS

Method: Least Squares

Sample 1993-2010

Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prb.
RSR	17509.81	6875.873	2.741115	0.0174
C	356295.7	162345.0	2.194682	0.0433

R-squared	0.473313	Mean dependent var	281786.3
Adjusted R-squared	0.453272	S.D dependent var	533586.3
S.E of regression	540504.0	Akaike info criterion	29.34394
Sum Squared resid	4.68E+12	Schwarz criterion	29.44287
Log likely hood	-262.0955	F-statistic	21.549225
Durbin-Waston Stat	1.204968	Prob (F-statistic)	0.0001146

Dependent Variable: GDS

Method: Least Squares

Sample 1993-2010

Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prb
RLR	14872.19	6511.655	2.362510	0.0286
C	315022.5	125115.4	2.517856	0.0228
R-squared	0.431039	Mean dependent var	281786.3	
Adjusted R-squared	0.404796	S.D dependent var	533586.3	
S.E of regression	520633.1	Akaike info criterion	29.26792	
Sum Squared resid	4.34E+12	Schwarz criterion	29.36685	
Log likelihood	-1.354953	F-statistic	17.85943	
Durbin-Waston Stat	1.354953	Prob (F-statistic)	0.001819	

Dependent Variable: GDS

Method: Least Squares

Sample 1993-2010

Included observations: 16

External observation: 2

Variable	Coefficient	Std. Error	t-Statistic	Prb
LOG (NLR)	4.092625	1.942881	2.059177	0.0613
C	1.776004	5.917417	0.300132	0.7685
R-squared	0.353247	Mean dependent var	11.15278	
Adjusted R-squared	0.332764	S.D dependent var	2.355426	
S.E of regression	2.243518	Akaike info criterion	4.570436	
Sum Squared resid	70.46719	Schwarz criterion	4.667009	
Log likelihood	-34.56348	F-statistic	12.53374	
Durbin-Waston Stat	0.477783	Prob (F-statistic)	0.007813	

Dependent Variables GDS

Method: Least Squares

Sample 1993-2010

Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prb.
INF	-7186.609	6007.133	2.741115	0.0174
C	356295.7	162345.0	-1.196346	0.2490
R-squared	0.473313	Mean dependent var	281786.3	
Adjusted R-squared	0.024740	S.D dependent var	533586.3	
S.E of regression	526944.6	Akaike info criterion	29.29202	
Sum Squared resid	4.44e+12	Schwarz criterion	29.39095	
Log likely hood	-261.0955	F-statistic	1.431243	
Durbin-Waston Stat	1.290322	Prob (F-statistic)	0.248990	

Dependent Variable: GDS

Method: Least Squares

Sample 1993-2010

Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prb
RGDP	22.44357	5.931851	4.266336	0.003
C	-1101832.	620840.5	-1.774742	0.0950
R-squared	0.643008	Mean dependent var	281786.3	
Adjusted R-squared	0.615696	S.D dependent var	533586.3	
S.E of regression	478536.3	Akaike info criterion	29.09929	
Sum Squared resid	3.66E+12	Schwarz criterion	29.19822	
Log likelihood	-259.8936	F-statistic	45.13627	
Durbin-Waston Stat	1.528444	Prob (F-statistic)	0.000007	

Dependent Variables GDS

Method: Least Squares

Sample 1993-2010

Included observations: 18

Excluded observation: 2

Variable	Coefficient	Std. Error	t-Statistic	Prb.
LOG(NGDP)	1.405985	0.191975	7.323788	0.0000
C	-8.012595	2.631518	-3.044856	0.0078
R-squared	0.793015	Mean dependent var	11.15278	
Adjusted R-squared	0.778231	S.D dependent var	2.355426	
S.E of regression	526944.6	Akaike info criterion	3.161671	
Sum Squared resid	4.44e+12	Schwarz criterion	3.258244	
Log likely hood	-261.0955	F-statistic	53.63787	
Durbin-Waston Stat	1.290322	Prob (F-statistic)	0.000004	

Dependent Variable: GDS

Method: Least Squares

Sample 1993-2010

Included observations: 16

Excluded observation: 2

Variable	Coefficient	Std. Error	t-Statistic	Prb
LOG(NGDP)	1.490490	0.322043	4.628228	0.0007
LOG(INF)	-0.938435	0.344026	-2.727799	0.0197

LOG(NSR)	2.517702	1.017027	2.475551	0.0308
LOG(NSR)	0.695626	0.936507	0.742788	0.4732
C	-15.63702	4.672519	-3.46593	0.0065
R-squared	0.907623	Mean dependent var		11.15278
Adjusted R-squared	0.874031	S.D dependent var		2.355426
S.E of regression	0.835991	Akaike info criterion		2.729909
Sum Squared resid	7.687695	Schwarz criterion		2.971343
Log likelihood		-16.83927	F-statistic	77.01916
Durbin-Waston Stat	3.184455	Prob (F-statistic)		0.000000

Dependent Variables LOG(GDS)

Method: Least Squares

Sample 1993-2010

Included observations: 16

Excluded observation: 2

Variable	Coefficient	Std. Error	t-Statistic	Prb.
LOG(NGDP)	8.608022	0.191975	7.323788	0.0000
LOG(INF)	-0.805042	0.858901	-0.937292	0.3687
RLR	0.083419	0.070102	1.189973	0.2400
C	-86.66494	26.86323	-3.226155	0.0081
R-squared	0.859509	Mean dependent var		11.15278
Adjusted R-squared	0.803421	S.D dependent var		2.355426
S.E of regression	1.030964	Akaike info criterion		3.149171
Sum Squared resid	11.69174	Schwarz criterion		3.390605
Log likely hood	-20.19337	F-statistic		16.82417
Durbin-Waston Stat	2.475432	Prob (F-statistic)		0.000117





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