The Effect Of Financial Liberalization On The Pprofitability Of Deposit Money Banks (Dmbs) In Nigeria: Bounds Testing Cointegration Approach

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Abstract: *This study examines the overall effect of Financial Liberalization on the Profitability of Deposit Money Banks (DMBs) in Nigeria. Most of the previous studies focused on the economic growth aspect of financial liberalization and yet, very little is known empirically about its effect on profitability of DMBs. To bridge this gap, a financial liberalization index has been developed to evaluate the effect on profitability of DMBs in Nigeria. Time series annual data from the period 1975-2013 are employed. The time series annual property of the data is analyzed using the Ordinary Least Squares (OLS) technique. The research utilizes an autoregressive distributed lag to co-integration approach (ARDL-ECM) to evaluate the effect. The result of the analysis of the study reveals that financial liberalization in Nigeria has brought a mixed effect. Financial liberalization does not lower profitability of DMBs in Nigeria due to high reserve ratio and heavy investment in stabilization securities. The result suggests that the government should fine tune the various policies in the liberalization package in order to enhance the performance of deposit money banks in Nigeria.*
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I. Introduction

In a number of developing countries of the world the financial system is highly regulated. This is because of the pivotal position the financial industry occupies in these economies. An efficient system, it is widely accepted, is a sine qua non for economic growth and efficient functioning of a nation's economy. Thus, for the industry to be efficient, it must be regulated in view of the failure of the market system to recognize social rationality and the tendency for market participants to take undue risks which could impair the stability and solvency of their institutions.

However, the highly controlled state of the financial system in developing countries pulled the private sector back from playing an active role in the economy. The government controlled the interest rates and credit ceilings, owned banks and other financial institutions, and framed regulations with a view to making it easy for the government to acquire financial resources at a low cost. In 1973, McKinnon (1973) and Shaw (1973) identified this problem of financial repression in developing countries and argued for a liberalization of the financial system. The standard economic theory suggests that liberalization strengthens financial development, leads to a more efficient allocation of resources, higher level of investment and higher long-run economic growth of the economy (Levine, 2001; Bonfiglioli and Meadicino, 2004).

The World Bank and the International Monetary Fund (IMF), since the mid-1980s, started to prescribe financial liberalization as a basic framework for member developing countries to foster their economic growth (The World Bank Group, 2005). With this, the era of financial liberalization started in the developing countries with the technical and financial assistance of the World Bank and the IMF. The initial liberalization measures taken by some developing countries in the early 1980s showed very impressive result. This type of result became the motivating factor for other developing countries to liberalize their financial sector.

Based on these expectations, in the past three decades, many African countries have implemented financial liberalization as a component of the Structural Adjustment Programme (SAP) under varying financial structures and different macro-economic conditions. To this end, such countries eased or lifted bank interest rate ceilings, lowered compulsory reserve requirements and entry barriers, reduced government interference in credit allocation decisions and privatized banks and insurance companies. Some countries even actively promoted the development of local stock markets and encouraged entry of foreign financial intermediaries.

For more than two decades after independence, the Nigerian financial system was repressed, as evidenced by ceilings on interest rates and credit expansion, selective credit policies, high reserve requirements, and restriction on entry into the banking industry. This situation inhibited the functioning of the financial system and especially constrained its ability to mobilize savings and facilitate productive investment.

In 1986, the authorities commenced an extensive reform of the financial system as part of the SAP. The major financial sector reform policies implemented were deregulation of interest rates, exchange rate and entry

into the banking business. Other measures implemented include: establishment of Nigeria Deposit Insurance Corporation (NDIC), strengthening the regulatory and supervisory institutions, upward review of capital adequacy standards, capital market deregulation and introduction of indirect monetary policy instruments.

Obviously, the sector that is most affected by financial liberalization is the commercial banking sector. The banking sector reform package is anchored on a 13-point programme, some of which include: increase in the minimum capital base requirement of the banks from ₦2 billion to ₦25 billion by the end of 2005, of which banks failing to meet the new requirements were expected to merge or else have their licenses revoked (Soludo, 2004). Implementation of the consolidation exercise triggered various mergers in the banking sector and reduced the number of deposit banks in Nigeria from 89 to 25 by the end of 2005.

In view of these structural changes, the question that arises is: What effects have these reforms had on the banking industry? Therefore, this study focuses on the effect of financial liberalization on the profitability of commercial banks (now deposit money banks) in Nigeria. This study assesses the effect using time series annual data from the period 1975-2013. Such 'before and after' liberalization approaches together with the Error Correction Model (ECM) are employed to control for other factors or developments that may have helped shape the performance outcome.

The study is relevant because the policy of financial liberalization has been an integral preoccupation of various governments of Nigeria since the IMF Structural Adjustment Programme of 1986. Besides, the study adds valuable knowledge to the existing literature on DMBs in Nigeria. Data on financial liberalization Index in Nigeria has been prepared. The study is also significant in that it utilizes a new methodology in evaluating the impact of financial liberalization on DMBs in Nigeria. To this end, an autoregressive distributed approach to co-integration has been employed to analyze the effect of financial liberalization on key performance variable, namely, profitability of DMBs in Nigeria.

Furthermore, the outcome of this research will be of immense benefit to the government on how to fine tune the various policies in the liberation package in order to promote the growth of DMBs in Nigeria. Also, the study is significant in that it will bring to the fore the linkage existing between financial liberalization and profitability of DMBs. Finally, the study will increase our understanding of the response of DMBs to the liberalization policies.

The rest of the paper is organized as follows. In section two, a survey of related literature on financial liberalization which forms the theoretical basis of this study is carried out. Section three focuses on the methodology of the study. The empirical results of this work are presented and discussed in the fourth section. The paper concludes in section five with the discussion of major findings and relevant recommendations.

II. Survey Of Related Literature

When banks mobilize deposits, they pay interest (deposit rates) to depositors and by so doing interest has turned out to be a cost of banks. By the same token, when banks give out loans they charge interest (lending rates) which turns out to be income to banks. An excess of the receipts over the spending of banks during any period constitutes their profits.

Before a bank fixes its lending rate, it has to take into account the cost it has incurred in mobilizing its funds. The cost includes adjustment for cash reserve deposits, deposit insurance premium (where the scheme exists) and the interest expense which when put together constitutes the cost of funds. The higher the cost of funds to a bank, the higher will be the lending rate set by that bank. But suffice it to say that, high lending rates do not necessarily translate into higher margin when the cost of funds is very high. However, it is important to stress that in view of the nature of banking business, interest income is expected to exact significant influence on banks' profitability (Ahmad, 2003).

In the literature, financial liberalization leads to removal of interest rate ceilings and reduction of barriers to entry. If competition among banks in the newly regulated financial sector is weak, liberalization may result in lower real deposit rates. Monopolistic banks can exploit the opportunity offered by the abolition of interest rate controls to widen the margins between their deposit and lending rates in order to increase profits. The bank spread – the difference between the charge to borrowers and the payment to depositors – is a standard measure of the cost of financial intermediation in the literature (Koeva, 2003).

Therefore, operating costs, priority sector lending, non-performing loans, investment in government securities, and the composition of deposits are among the determinants of bank profitability. Banks with higher levels of non-performing loans have significantly lower profitability. Banks with a higher share of current deposits (as a proportion of total deposits) have significantly lower bank spread and higher profitability.

Uchendu (1995) examines monetary policy and the performance of deposit money banks in Nigeria. Using the OLS method for the 1970-1993 period for 3 groups of data (for all banks, for six banks, and three banks), an analysis of the industry data show a strong relationship between monetary policy instruments and deposit money bank profitability measures, suggesting that appropriate monetary and banking policies are

important factors to the continued stability and profitability of the deposit money banking industry. More important, interest rates, exchange rates, reserves, concentration ratio are found to be determinants of banks' profitability in Nigeria. Odufalu (1994) in a study on monetary policy and banks' profitability in Nigeria also find the determinants of banks' profitability to include total deposits, Treasury bill rates and lending rates.

The subject of monetary policy influence on bank's profitability is further investigated by Ogunleye (1995) using the single equation approach and data from Nigerian banks. His profit equation adopts Sealey's (1980) complete model of financial intermediary behaviour which integrates risk considerations of the portfolio approach with the market conditions, cost factors and deposit rate-setting behavior of the firm.

With a sample of 35 banks, it is found that monetary policy to a large extent influences variation in banks profitability in Nigeria. On the aggregate, 3 significant independent variables interest rate spread, reserve ratio, and exchange rate regime including the constant were able to explain 72% of the variation in ROE. On the other hand, another set of independent variables – changes in reserve ratio, permissible credit growth, and stabilization securities, are significant at different levels – accounting for 33.9% of variation in ROA. The policy implication of the study is that the determinants of profitability included reserve ratio, permissible credit growth, stabilization securities and exchange rate.

Hancock (1989) and Flannery (1984) draw some conflicting conclusions on the influence of interest rates on the profitability of banks based on the findings of their individual studies. For instance, Hancock (1989) finds that increases in interest rates which leave the spread between borrowing and lending costs unchanged, decrease profit before deregulation and increase profitability after deregulation. Flannery (1984) on the other hand come to a conclusion that bank profits do not respond to level of market interest rates. This therefore means, each time the market rate changes, the responses of bank revenues and costs approximately cancel one another, leaving the level of bank profits only slightly sensitive to market rates in most cases.

Uhomoibhi (2008) investigated the determinants of bank profitability macroeconomic evidence from Nigeria seeking to econometrically identify significant using a panel data set comprising 1255 observations of 154 banks over a period of 1980-2006. The indices over the same period regression result reveal that interest rate, inflation, monetary policy and exchange rate regime are significant macroeconomic determinants of bank profitability in Nigeria banking sector. From what is found in the literature, it can be seen that the determinants of banks' profitability are many and at varying degrees.

In Ezirim's (2005) view, banks lending decisions generally are fraught with a great deal of risks, which calls for great deal of caution and tact in this aspect of banking operations. The success of lending activity to a great extent therefore, lies on the part of the credit analysts to carry out good credit analysis, presentations, structuring and reporting.

Nonetheless, Samad (2004) examined the study of Bahran's commercial banks performances during 1994-2001. The main focus of the study was to examine empirically the performance of Bahrain's commercial banks with respect to credit (loan), liquidity and profitability during the period. By applying students't-test to the financial measure, it was shown that commercial banks liquidity performance is not at par with the banking industry. That is, commercial banks are relatively less profitable and less liquid as expected. Although Chizea (1994) asserted that there are certain aspects of fiscal and monetary policies which could affect the decision of the discerning and informed public to patronize the bank and the lending behavior of commercial banks. Paramount amongst these measures is what could be called the interest rate disincentives. Interest rates have been so low in the country that they are negative in real terms. As inflation increased, the purchasing power of money lodged in deposit accounts reduce to the extent that savers per force pay an inflation tax. There is also the fear that the hike in interest rates would increase inflations rates and make a negative impact on the rate of investment. Thus, on the above, Naceur and Goaid (2010) investigated the determinants of commercial banks interest margin and profitability (evidence from Tunisia). The study received the impact of banks characteristics, financial structure and macroeconomic indicators on banks' net interest margin and profitability in Tunisia banking sector for the period of 1980-2000. It shows that individual bank characteristic explain a substantial part of the within country variation in bank interest margin and net profit. High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital and with large overheads size is found to impact negatively on profitability which implies that Tunis banks are operating above the optimum level.

The mandatory interest rate according to William (2009) will result to a near shut down in lending ratio volume to any bank with major credit concern because, new policy ensures that only the highest quality borrowers have access to a new bank credit within the year. But, the study of Ojo (1999) revealed that commercial banks can lend on medium and short term basis without necessarily jeopardizing their liquidity. If they must contribute meaningfully to the economic development, the maturity pattern of their loans should be on a long term nature rather than of short term period. Davis and Zhu (2005) examined the study of commercial property prices and bank performance during the 1989-2002 periods. This paper seeks to fill the gap by

undertaking an extensive analysis of a sample of 904 banks worldwide. It seeks to assess the effect of changes in commercial property prices on bank behavior and performances in 15 industrialized economies. The result of this study suggest that commercial property price tend to be positively associated with bank lending and profitability, negatively associated with banks' net interest margin, bad loan ratios. Such impact exists even when conventional independence variable determining banks performance are included as controls.

III. Methodology

This study utilized the autoregressive distributed lag to co-integration approach (ARDL-ECM) (Pesaran and Shin, 1999; Pesaran *et. al.,* 2001). More recent studies have indicated that the ARDL approach to cointegration is preferable to other conventional cointegration approaches such as Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1990) and Gregory and Hansen (1996).

One of the reasons for preferring the ARDL is that the bounds test procedure is simple. As opposed to other multivariate cointegration techniques such as Johansen and Juselius, it allows the cointegration relationship to be estimated by OLS once the lag order of the model is identified. Secondly, the bound testing approach does not require classification of the order of integration of the series since cointegration can be applied irrespective of whether the regressors in the model are purely I(0), purely I(1) or mutually co-integrated. Thirdly, the test is relatively more efficient in small or finite sample data sizes as is the case in this study. The procedure will, however, crash in the presence of I(2) series.

Moreover, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation (Banerjee *et al.,* 1993). The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. It is also argued that using the ARDL approach avoids problems resulting from non-stationary time series data (Laurenceson and Chai, 2003). Finally, the ARDL technique generally provides unbiased estimates of the long run model and valid t-statistics even when some of the regressors are endogenous (Harris and Sollis,2003 quoted in Constant and Yue, 2010).

3.1 Financial Liberalization-Profitability Index Model (FLPIM)

DMBs are deposit taking financial institutions. They make profit by lending at higher rates of interest than the rate they pay on deposits. This means a higher interest rate spread. A persistent high interest rate spread inhibits financial development. However, when the interest rate spread is low, the depositors receive a higher interest on their resources and the borrowers get the resources at a lower interest rate. The interest rate spread of the DMBs had remained quite high.

Therefore, one of the specific objectives of financial liberalization was to lower the interest rate spread of the banks thereby leading to increased bank competition and lower or zero profits. The assumption of zero profits in the banking sector means that when the interest rate paid to depositors is raised through government action the borrowing rate must rise as well, in order to avoid large operating losses in the banking sector.

In order to measure the impact of financial liberalization on DMBs' profitability the profit function developed by Ogunleye (1995) was adopted. His basic profit model is of the form:

$$\Pi_{(E,A)} = f(r, q, g, l, s, x)$$

Where: π = profit (Net); r = reserve ratio, q = liquidity ratio, g = permissible annual percentage credit growth, l = interest rate spread, s = a dummy variable representing stabilization securities.

The profit model was modified for use as follows:

$$PBT_t = \alpha_0 + \alpha_1 DRV_t + \alpha_2 PSL_t + \alpha_3 IRS_t + \alpha_4 NER_t + \alpha_5 DSS_t + \alpha_6 CTD_t + \alpha_7 FLI_t + e_t \quad .... (1)$$

      PBT = Profit before Tax

      DRV = DMBs system Reserves

    IRS = Interest Rate Spread. (This is defined as interest rate differential between

          maximum lending rate and savings deposit

      DSS = DMBs Stabilization Securities

CTD= Composition of total deposits (share of current deposits as a proportion of total

          Deposits)

      FLI = Financial Liberalization Index

In this equation, α_0 is the intercept, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and α_5 are the coefficients of the respective variables, and e_t is the white noise which is assumed to be normally distributed with mean and variance 0 and σ^2, respectively.

Using the natural log (L) form, the above equation can be written as follows:

$$LPBT_t = \alpha_0 + \alpha_1 LDRV_t + \alpha_2 IRS_t + \alpha_3 DSS_t + \alpha_4 CTD_t + \alpha_5 FLI_t + e_t \quad ..... (2)$$

In this equation IRS, DSS, CTD and FLI are in level form, as some of the observations in these variables are zero or negative, and these cannot be converted into the log form. The 'a priori' expectations are

determined by the principles of economic theory and refer to the expected relationship between the explained variable and the explanatory variable(s). Therefore, the expected signs of the coefficients α_1, α_2, α_4 and α_5 are positive, whereas that of α_3 is negative.

3.2 The VECM ARDL Model

As discussed earlier, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation. The following simple model is considered here:

$$y_t = \alpha + \beta x_t + \delta z_t + e_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

where y_t, x_t and z_t are three different time series; e_t is a vector of stochastic error terms; and α and β are the parameters. For the above equation, the error correction version of the ARDL model is given by:

$$\Delta y_t = \alpha_o + \sum_{i=1}^{P} \beta_i \Delta y_{t-I} + \sum_{i=1}^{P} \delta_i \Delta z_{t-I} + \sum_{i=1}^{P} \sum_i \Delta z_{t-I} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \lambda_3 z_{t-1} + \mu_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \ldots (4)$$

The null hypothesis in equation (7) is $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0$ which means the non-existence of a long run relationship. The ARDL method estimates $\{P+1)^k$ number regressions in order to obtain optimal lag length for each variable, where p is the maximum number of lags to be used and k is the number of variables in the equation.

As stated earlier, the variables considered in this study are a mix of I(0) and I(1) series. The cointegration test methods based on Johansen (1991; 1995) and Johansen-Juselius (1990) require that all the variables be of equal degree of integration. Therefore, these methods of cointegration are not appropriate and cannot be employed. Hence, the ARDL modeling approach for cointegration analysis is adopted in this study.

The ARDL framework for the equation is as follows:

$$\Delta LPBT_t = \delta_0 + \sum_{i=1}^{P} \varepsilon_i \Delta LPBT_{t-I} + \sum_{i=1}^{P} \emptyset_i \Delta LDRV_{t-I} + \sum_{i=1}^{P} y_i \Delta IRS_{t-I} + \sum_{i=1}^{P} \tau_t \Delta DSS_{t-1} + \sum_{i=1}^{P} \beta_i \Delta CTD_{t-1} + \sum_{i=1}^{P} Y_i \Delta FLI_{t-1} + \lambda_1 LPBT_{t-1} + \lambda_2 LDRV_{t-1} + + \lambda_3 IRS_{t-1} + \lambda_4 DSS_{t-1} + \lambda_5 CTD_{t-1} + \lambda_6 FLI_{t-1} + u_{1t} \ldots\ldots\ldots\ldots(5)$$

3.3 Sources of Data

The data used in the study are time series spanning between 1975 and 2010 as mentioned earlier, from World Bank, UNDP, National Bureau of Statistics, Abstracts of Statistical and Social Indicators, CBN Economic and Financial Review.

IV. Empirical Results

4.1 Unit Roots Test

Before proceeding with ARDL bounds test, the stationarity statuses of all variables are tested to determine their order of integration. This is to ensure that the variables are not 1(2) stationary so as to avoid spurious results. According to Pesaran et al. (2001) in the presence of 1(2) variables the computed statistics are not valid because the ARDL bounds test is based on the assumption that the variables are 1(0) or 1(1). Therefore, the implementation of unit root tests in the ARDL procedure might still be necessary in order to ensure that none of the variables is integrated of order 2 or beyond.

The study applies a more efficient univariate DF-GLS test for autoregressive unit root recommended by Elliot et al.(1996). The test is a simple modification of the conventional Augmented Dickey-Fuller(ADF) t-test and it applies generalized least squares (GLS) detrending prior to running the ADF test regression. Compared with the ADF tests, the DF-GLS test has the best overall performance in terms of sample size and power. The test regression includes both a constant and trend for the log-levels and a constant with no trend for the first difference of the variables.

Table 1: DF-GLS Unit Root Tests on Variables in FLPIM

Variable	Level	1st difference	Lag	Results
LPBT	-3.261490	-6.314452	1	1(0)
LDRV	-2.913838	-7.002711	1	1(0)
IRS	-3.237497	-6.428649	1	1(0)
DSS	-2.168987	-2.268329	1	1(1)
CTD	-2.831235	-2.932557	1	1(1)
FLI	-1.959760	-4.154792	1	1(1)
Critical Values	-3.770000	-2.636901		
1%	--3.190000	-1.951332		
5%	-2.890000	-1.610747		

10%				

Source: Author's calculation

4.2 Bounds Tests for Co-integration

In the first step of the ARDL analysis, the study tests for the presence of long run relationships. Co-integration analysis helps to clarify the long run relationships between the integrated variables. According to Pesaran and Pesaran(1997), "this OLS regression in first differences are of no direct interest" to the bounds co-integration test. The F-statistic tests the joint null hypothesis that the coefficients of the lagged level variables are zero (i.e. no long-run relationship exists between them). At this stage, the calculated F-statistic is compared with the critical value tabulated , these critical values are calculated for the different number of regressors. According to Bahmani-Oskooee and Nasir(2004), these "critical values include an upper and a lower band covering all possible classifications of the variable into 1(1) and 1(0) or even fractionally integrated". If the F-statistic is above the upper critical value, the null hypothesis of no long-run relationship can be rejected irrespective of the orders of integration for the time series. Conversely, if the test statistic falls below the lower critical value the null hypothesis cannot be rejected. Finally, if the statistic falls between the lower and upper critical values, the result is inconclusive. In such an inconclusive case, an efficient way of establishing co-integration is by applying the ECM version of the ARDL model.

Since all observations are annual and the number of observations is limited, the study chooses 2 as the maximum lag length in the ARDL model. Table 2 reports the results of the calculated F-statistics when each variable was considered as a dependent variable (normalized) in the ARDL-OLS regressions.

Table 2: Results of F-statistic for Testing the existence of a long-Run Relationships among Variables in FLPIM

Dependent Variable	AIC Lags	F-statistic	Probability	Outcome
LPBT	2	3.204406	0.037735	Co-integration
LDRV	2	4.654739	0.008943	Co-integration
IRS	2	2.801833	0.057458	Co-integration
DSS	2	1.062828	0.380049	No co-integration
CTD	2	6.419278	0.001809	Co-integration
FLI	2	0.437292	0.727994	No co-integration

Source: Author's calculation using E-views 9 Software Package

Note: Asymptotic critical value bounds were obtained from the Biometrica Tables for Statisticians Vol.1(ed.1), edited by Pearson E.S. and Hartley H.O. Intercept and no trend for k=7 at Upper bound 5%=2.42, 1%=3.47.

4.3 Bound Tests and Analysis

The results of the long-run coefficients of the variables under investigation and their respective short-run coefficient estimates obtained from the ECM version of the ARDL model are reported as follows:

Table 3 Profitability Index Model (FLPIM)

ARDL Model Long Run Results

Dependent Variable: LPBT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.831014	0.999132	7.837814	0.0000***
LDRV	-0.391673	0.129830	-3.016803	0.0052***
IRS	-0.011212	0.039364	-0.284833	0.7777
DSS	-3.02E-05	1.29E-05	-2.345228	0.0258**
CTD	-0.009996	0.007975	-1.253344	0.2198
FLI	3.508608	0.436675	8.034818	0.0000***

, * Significant at 5% and 1% respectively
Source: Author's computation using E-views 9 Software Package

Table 4: ARDL Model ECM Results

Dependent Variable: DLPBT

Variable	Co-efficient	Std. Error	t-Statistic	Prob.
DLPBT(-1)	0.151368	0.130225	1.162359	0.2553
DLDRV	-0.438195	0.075540	-5.800836	0.0000***
DIRS	0.022200	0.026076	0.851379	0.4020
DLDSS	-2.19E-05	1.30E-05	-1.680068	0.1045*
DCTD	0.000690	0.011372	0.060655	0.9521
DFLI	1.442542	0.606509	2.378437	0.0247**
ECM(-1)	-0.593502	0.180253	-3.292612	0.0028**

*, **, *** Significant at 10%, 5% and 1% respectively
Source: Author's computation using E-views 9 Software Package

The ARDL results that are presented in Table 3 reveal that the coefficient of FLI is statistically significant at the one per cent level and that of DFLI in Table 4 is not statistically significant. This implies that FLI is associated positively with LPBT in the long run but not in the short run. The coefficient of FLI, which is 3.508608, states that a unit increases in the composite index of the overall financial liberalization is associated with an increase of 33.40 million Naira in the profits of DMBs in Nigeria in the long run. (LPBT is in the log form, while FLI is in the level form. Antilog of the coefficient of FLI is 33.40174019).

In non-conformity with the a priori expectation, LDRV has a negative association with banks profitability (LPBT). This meant that part of the reserve requirements (LDRV) maintain by the banks to meet reserve ratio could not be put to profitable use. Also, DSS has an inverse relationship with LPBT, as expected both in the short and in the long run. This is in line with one of the specific objectives of financial liberalization which is to lower profits in the banking sector. A unit increase in DSS lowers LPBT of DMBs by as much as ₦1.03 million in the short run and ₦1.02 million in the long run.

In Table 5.10, the coefficient of ECM (-1) estimated at -0.593502, is of the correct sign and highly significant at one per cent level. This confirms once again the existence of the long run co-integrating relationships among the variables. The estimate implies a very high speed of adjustment to equilibrium after a short run shock. Approximately 50 per cent of disequilibria in the previous year's shock converge back to the long run equilibrium in the following year. The ECM also reveals that the signs of the short-run dynamic impacts are maintained in the long run. However, this time the FLI is not significant. This means that the FLI which has a long run positive impact on profitability of DMBs has no impact in the short run.

4.4 Diagnostic and Stability Tests
The explanatory power of the model is 94 per cent for the profitability index, It thus fits very well. When there is no serial correlation, the DW statistic will be close to 2. And as shown by their DW statistics of 1.94 which is not too low, there is no severe serial correlation problem in the model.

Diagnostic tests for normality, serial correlation, heteroscedasticity and structural stability of the model is considered in this study. As shown in the Appendix the model generally passed all diagnostic tests in the first stage. These tests show that there is no evidence of autocorrelation as implied by small values of F statistics and their p values – profitability index having 2.421183(0.1306) .

The JB statistic and p values of FLPIM 0.603250(0.739615) presuppose that the null hypothesis that the residuals are normally distributed and cannot be rejected for the p values of obtaining the JB statistics of the model is about 78 per cent. Since the p value in this application is sufficiently low and the value of the JB statistic is very different from zero, one cannot also reject the hypothesis that the residuals are normally distributed.

The F statistics used to test the homoscedasticity assumption of the model is 0.262934(0.930014) . Examination of the table of the F distribution shows that the critical value of F at the 5 per cent level of significance is 2.42. The conclusion is that the null hypothesis is rejected in favour of the alternative hypothesis of heteroscedasticity. Nonetheless, the ARDL model has been shown to be robust against residual autocorrelation. Therefore, the presence of heteroscedasticity does not affect the estimates (Laurenceson and Chai, 2003). Since the time series analysed in this study are of mixed order of integration, i.e., I (0) and I (1), it is natural to detect heteroscedasticity.

It also passes the test of functional form misspecification as evidenced from their F low values of 0.834166(0.3686) and not highly significant. Chow forecast test is also carried out. Since the values of the F statistic as reported in the Appendix is not greater than the critical value of the F distribution at the 5 per cent level the null hypothesis cannot be rejected. The data can be pooled and it is correct to assume equal coefficients. The study therefore accepted that the structural coefficients are stable.

Finally, when analyzing the stability of the long run coefficients together with the short run dynamics, the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) are applied. According to Pesaran and Pesaran(1997), the stability of the estimated coefficients of the error correction models should also be empirically investigated. A graphical representation of CUSUM and CUSUMSQ statistics are shown in the Appendix .

Following Bahmani-Oskooee (2001), the null hypothesis (that is, that the regression equation is correctly specified) cannot be rejected if the plot of these statistics remains within the critical bound of the 5 per cent significance level. As it is clear from the Appendix, the plots of both CUSUM and the CUSUMSQ are within the boundaries and hence these statistics confirm the stability of the long run coefficients of the functions

in the model. The CUSUM and CUSUMSQ stability tests also show that the estimated coefficients of the ECM are stable.

V. Summary, Recommendations And Conclusion
5.1 Summary of Findings and Policy Implications
The empirical test results show that financial liberalization in Nigeria has brought a mixed impact on DMBs in Nigeria. The major findings are discussed in the following sub-sections.
5.1.1 Profitability of DMBs
(i) One of the main findings emerging from this study indicates that financial liberalization in Nigeria does not lower banks profitability in the short run but has impacted on the profitability of banks at one per cent significant level in the long run. Hence, it can be argued that financial liberalization has constituted a major factor in DMBs profitability. This is at variance with the hypothesis that deregulation leads to lower or zero profits.

(ii) In non-conformity with the a priori expectation, the DMBs system reserves (LDRV) variable has a negative association with the profitability of DMBs in Nigeria. This means that the sustained maintenance over time during the era of financial liberalization must have been one of the factors that dampen banks' profits since not all of the reserves can be put to profitable use.

(iii) Another finding of this study is that stabilization securities (DSS) variable is the key determinant of banks' profitability. It is negatively associated with banks' profitability both in the short and long run. Therefore, increased floating of stabilization securities as a result of the deregulation must have acted as a depressant to DMBs profitability both in the short and in the long run.

(iv) The results also show that financial liberalization which leads to increased interest rate spread (IRS) has no significant impact on profitability and so do not lower banks' profitability in Nigeria. This conforms to the conclusion reached by Flannery (1984) that bank profits do not respond to the level of market interest rates.

5.2 Recommendations
In the light of the major findings, as presented in chapter six, the following policy recommendations are proposed.

5.2.1 Profitability of DMBs
(i) Since one of the objectives of financial liberalization is to attain lower or zero monopoly profits and is positively associated with banks profits, an additional mechanism should be put side by side with the implementation of financial liberalization. This will reduce banks profitability that is currently on the increase in Nigeria. In this respect, a balance will be struck in meeting the profitability needs of the shareholders and objective of the deregulation.

(ii) Systems reserves should be increased since they have a negative association with profits. This will go a long way in lowering monopoly profits. This will be in support of adoption of the total financial liberalization hypothesis suggested in the Mckinnon – Shaw thesis that recommends increased financial liberalization for developing economies.

(iii) It was observed that stabilization securities were negatively associated with DMBs' profitability. Therefore, the government should increase the tempo of floating stabilization securities as a policy thrust. This is in line with one of the objectives of financial deregulation which is to lower monopoly profits in the banking sector.

(iv) Excessive regulation of interest rates should be relaxed since these are not major arguments in the profitability of DMBs in Nigeria. As a policy thrust therefore, the interest rates should be totally deregulated. Moreover, the monetary authorities should put in place enabling environment to reduce the interest spread for a healthy financial development in the country.

5.3 Conclusion
This study applies ARDL model with ECM approach to analyze the impact of financial liberalization on DMBs in Nigeria in terms of profitability index, credit to the private sector and deposit growth. The empirical test results show that financial liberalization in Nigeria has brought a mixed impact. Findings of this study did not support the hypotheses on the anticipated impact of financial liberalization on DMBs in Nigeria. Financial liberalization does not lower profitability in DMBS due to high reserve ratio and heavy investment in stabilization securities. And the implementation of the deregulation does not increase credit availability to the private sector due to increasing dosage of stabilization securities and lending rates, and of course, the paucity of loan supply. Furthermore, deposit growth has been witnessed by the DMBs during the period of deregulation as a result of the overall liberalization package and increase in per capita income, per capita bank branch,

government deficit spending and not just as a result of a rise in interest rates as asserted by McKinnon hypothesis.

Therefore, if the proposed recommendations can be implemented, it will help to achieve the intended objectives of deregulation and a virile and vibrant financial system in general and DMBs in particular.

References
[1]. Ahmad, H.I. (2003). Trend in the profitability of banks in Nigeria before and during interest rate deregulation: A comparative analysis. *NDIC Quarterly*, September, 13(3): 59-84.
[2]. Bahmani-Oskooee, M. and Nasir, A.(2004). ARDL approach to test the productivity bias Hypothesis. Rev. *Development Economics Journal*, 8: 483-488.
[3]. Banerjee, A., Dolado, J.J., Galbraith, Z.W. and Hendry, D.F. (1993). *Cointegration error correction and the econometric of non-stationary data.* Oxford: Oxford University Press.
[4]. Bonfiglioli, A. and Mendicino, C., (2004). Financial liberalization, banking crises and growth: Assessing the links. SSE/BFI Working Paper No. 567.
[5]. Chizea, G. (1994). Analysis of monetary and fiscal policies, broader perspectives. 2nd edn, 12-24, BBT Press.
[6]. Davis, E.P. and Zhu, H. (2005). Commercial property price and bank performance, 33,11-23, World Press.
[7]. Elliot,G.,Rothenberg T.J.and Stock J.H.(1996). Efficient tests for an autoregressive unit root. *Econometrica*, 64:1-24.
[8]. Engle, R.F. and Granger, C.W.J. (1987). Co-ointegration and error correction: Representation, estimation, and testing. *Econometrica* 55(2): 251-276.
[9]. Ezirim, F. (2005). Impact of bank lending on liquidity of banks in Nigeria. IJJS Publication, 2, 44-56.
[10]. Flannery, M.J. (1984). How do changes in market interest rates affects profits? Business Review, Federal Reserve Bank of Philadelphia, Sept./ Oct.
[11]. Gregory, A.W. and Hansen, B.E. (1996). Tests for cointegration in models with regime and trend shifts. *Oxford Bulletin of Economics and Statistics*, 58: 555-560
[12]. Hancock, D. (1989). Bank profitability, deregulation and the production of financial services. Research Working Paper, Federal Reserve Bank of Kansas City, December.
[13]. Harris, R. and Sollis, R. (2003). *Applied time series modeling and forecasting.* West Sussex: John Wiley and Sons Ltd..
[14]. Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamic and Control.* 12: 231-254.
[15]. Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica.* 59(6): 1551-1580.
[16]. Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models.* Oxford: Oxford University Press.
[17]. Johnsen, S. and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration – with applications to the demand for money. *Oxford Bulletin of Economics and Statistics.* 52(2): 169-290.
[18]. Koeva, P. (2003). The performance of Indian Banks during financial liberalization. IMF Working Paper, wp/03/150.
[19]. Lawrenceson, J. and Chai, J.C.H. (2003). *Financial reform and economic development in China.* Cheltenham, UK: Edward Elgar.
[20]. Levine,R., (2001). International financial liberalization and economic growth. *Review of International Economics*, 9(4):688-702.
[21]. Mckinnon, R.I. (1973). *Money and capital in economic development.* Washington, DC: Brookings Institution.
[22]. Naceur and Goaid (2010). Determinants of commercial bank in Nigeria, 5,19-29, Macmillan Publication limited.
[23]. Odufalu, O. (1994). Monetary policy and banks' profitability in Nigeria. *First Bank of Nigeria Plc, Bi-Annual Review, Dec.*
[24]. Ogunleye, R.W. (1995). Monetary policy influence on banks profitability: Evidence from single equation approach. *NDIC Quarterly,15(4), December.*
[25]. Ojo, D. (1999). Roles and failures of financial intermediaries. *CBN Bullion*, 23(3), 10-12.
[26]. Pesaran, M.H and Pesaran, B. (1997). *Working with Microsoft 4.0: Interactive econometric analysis.* Oxford: Oxford University Press.
[27]. Pesaran, M.H. and Shin, Y. (1999). An autoregressive distributed lag modeling approach to cointegration analysis. In S. Strom, A. Holly & P. Diamond (Eds.). *Econometrics and economic theory in the 20th century: The Ranger Frisch Centennial Symposium.* Cambridge: Cambridge University Press. Available at: www.econ.cam.uk/faculty/pesaran/ADL.pdf.
[28]. Pesaran, M.H., Shin Y. and Smith R.J.(2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometric* 16: 289-32.
[29]. Samad, A. (2004). Bahrains commercial bank performance as during 1994-2001. Credit and Financial Management (working paper).
[30]. Sealey, C.W. (1980) .Deposit rate-setting, risk aversion and the theory of depository financial institution. *Journal of France*, December
[31]. Shaw, E.S. (1973). *Financial deepening in economic development.* New York: Oxford University Press.
[32]. Uchendu, O.A. (1995) . Monetary policy and the performance of commercial banking in Nigeria, Monograph, Research Department, CBN
[33]. Uhomoibhi, Tony (2008). Determinants of bank profitability macroeconomics, evidence from Nigeria. Deakin University, (Working paper).
[34]. Williams, E. (2009). The return of interest rate caps. Business World Publication, May 17.
[35]. World Bank Group (2005). *Financial sector assessment program.* www/.Worldbank/org/finance/html/fsap.htm

APPENDIX
Statistics of the ARDL Models
1. Profitability Index
1.1 Key Regression Statistics
R^2 = 0.94
DW =1.94
Diagnostic Test Results
1.2.1 Residual Tests

(a) Normality (Jarque-Bera Statistic) = 0.603250(0.739615)
(b) Breusch-Godfrey Serial Correlation LM Test F (1, 29) = 2.421183 (0.1306)
(c) Heteroscedasticity F(5,30) = 0.262434 (0.930014)

1.2.2   Stability Tests
(a) Chow forecast Test (1975-2010) F (6, 24) = 2.935051 (0.0272)
(b) Ramsey Reset Test (Functional form of misspecification errors) F (1, 29) = 0.834166 (0.3686)

1.3 Plot of CUSUM and CUSUMSQ

Plot of Cumulative Sum of Recursive Residual
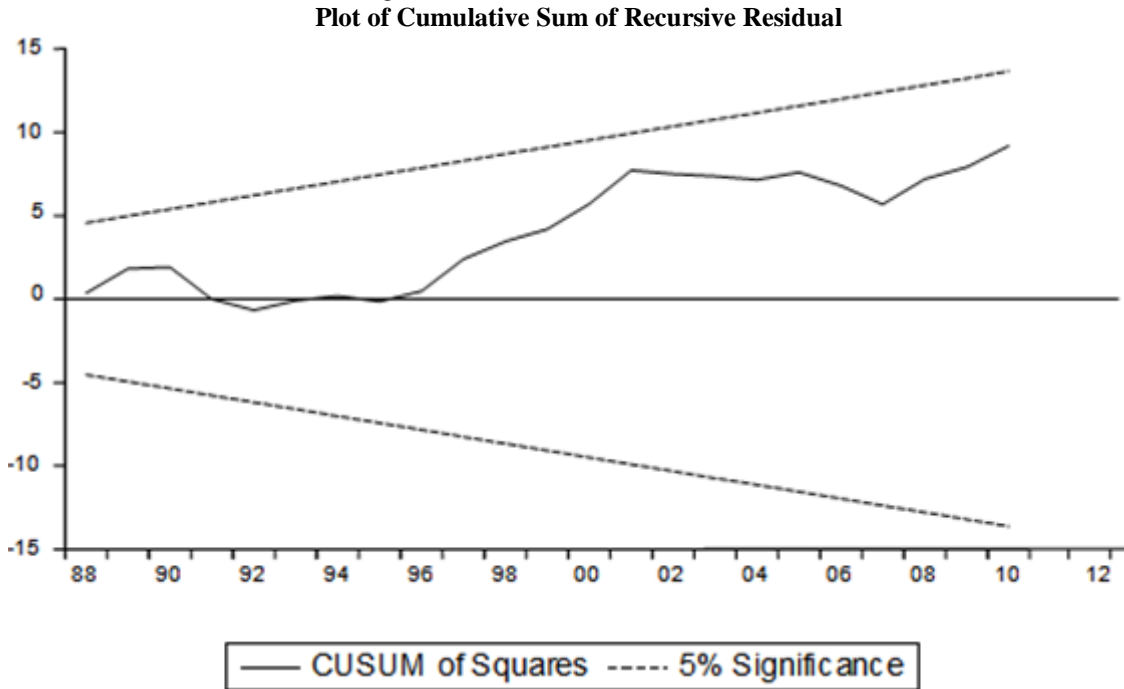
Plot of Cumulative Sum of Squares of Recursive Residuals