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Strategies for Lowering Banks' Cost of Funds in Nigeria

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Strategies for Lowering Banks' Cost of Funds in Nigeria

By
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Abstract

This study is motivated by banks' high cost of fund which has resulted in persistent high lending rates in Nigeria. The study, investigates determinants of banks' cost of funds. A panel regression analysis was employed using bank-specific, industry-specific and macroeconomic data involving 10 selected deposit money banks from January 2012 to March 2014. To contain the problems of endogeneity and cross sectional heterogeneity identified, the Generalized Method of Moment (GMM) approach was used. The results of the estimations of weighted banks' cost of fund and profitability model indicated that banks funding costs are determined by bank specific characteristic mainly salaries and wages, other overheads including cost of infrastructure, banks' risk premium, liquidity condition and inflation as well as money supply. To reduce banks' cost of funds, the paper recommends sustenance and promotion of the CBN and federal government interventions in infrastructural development, further liberalization of financial market through introduction of more instruments, balancing price stability objectives and earning ability of banks when using CRR and promote shared service schemes to reduce banks' other overhead costs.

Monetary Policy Department

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1.0 Introduction

Banks source funds from short term[3] and long term sources[4]. The costs incurred by banks in the process of sourcing funds include direct and indirect costs. These costs constitute major elements of determining banks' lending rates along with credit risks of the loans and general liquidity conditions. It is clear that economic growth and development reduces cost of operations for any economic agent due to availability of social and economic infrastructure and healthy competition.

In Nigeria, lending rates have remained persistently high over the last two decades, raising concerns among policy makers, investors and other economic agents, about financing sustainable economic growth. Many reasons, including tight monetary policy, structural rigidities in the economy leading to high cost of raising funds by Deposit Money Banks (DMBs) are adjudged responsible for these high lending rates. For instance, increased overhead costs, contributions by DMBs to the Asset Management Corporation of Nigeria (AMCON) sinking fund and Payment of NDIC premium put additional pressure on banks' earnings and the cost of funds. To mitigate these pressures, banks reduce deposit rates, re-price their loans, raise the Nigerian Interbank Offered Rates (NIBOR) due to sudden liquidity shortage, which may necessitate regulatory intervention to improve liquidity conditions. These additional costs may partly transmit to high lending rates which have remained under double digit over the years.

It is argued that, high cost of funds makes banking business very unviable and unprofitable because the resulting high interest rates increases credit risk (Raknerud and Bjorn, 2013). While, Nigerian banks are generally profitable much of the revenues could be traced to non-interest income such as foreign exchange market operations. Since banks are largely profitable even with lower loan portfolios, the regulatory authorities need to address the issue of vogue opportunities for banks outside the financial intermediation function. This study seeks to address the following questions: (1) what are the determinants of funding costs? and how to achieve lower lending rates. We employed both descriptive and

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[3] These include deposit, or short term debt instruments, etc)
[4] shares, bonds and debentures

econometric techniques to identify key determinants of banks cost of funds and high profitability.

To achieve these objectives, the rest of the paper is organized in Five Sections. Section 2 discusses stylized facts relating to banks' cost of funds and lending rates. In Section 3, literature review, conceptual issues and theoretical framework are reviewed. Section 4 presents econometric analysis. Section 5 provides policy recommendations and conclusion.

2.0 Stylized Facts on Banks' Cost of Funds and Lending Rates in the Nigeria

2.1 Developments in Banks' Cost of Funds

The discovery of oil in 1956 in Nigeria led to increase in revenue to government and this led to huge expenditure to rebuild economic infrastructure after the civil war. Increased government expenditure fuelled inflation and increased the overall cost of doing business in Nigeria. In response, government approved the Udoji wage increase across all sectors of the economy including the banking sector. Poor infrastructure further increase the cost of doing banking business as banks had to provide their own electricity.

The growth in the number of banks in Nigeria in 1980s, without adequate capital led to aggressive mobilization of deposits associated with excessively high deposit rate at distressed rates. It became imperative for banks to charge high lending rates so as to make profit. In addition, illiquid banks began to accept excessively high interbank rates ranging between 25 and 35 per cent, necessitating an increase in retail interest rates in line with the tenets of the channel of the transmission mechanism.

The manufacturing sector in addition to the problem of poor infrastructure at the time had to face high lending rates, which required the government to intensify efforts to reduce the lending rates. Thus, under the direct monetary control regime, the CBN adopted interest rate fixing, selective credit control and spread between Minimum Rediscount Rate and lending rate which was fixed at four per cent above the MRR. However, the liberalization of interest rates in 1987, removed these controls and banks were expected to fix their interest rate by negotiating with their customers.

In 2001, the CBN directed that banks should not include overheads as part of their cost of funds in determining their lending rates. During this period, overhead cost included costs of advertising, data processing services, software development, parts of legal fees, networking information technology and auditing. In 2009, banks were requested to submit their pricing model reflecting detailed components that add up to their lending rates. A bank submission includes (1) interest expense, (2) insurance Premium, (3) Cash and clearing, (4) cost of liquidity, (5) overheads recovery rate, (6) cost of risk (7) Minimum profit margin. Numbers (1) to (4) were referred to as cost of funds and the remaining other costs, which are considered in setting its lending rates.

Following the heterogeneity in banks' pricing models, the Bank in 2010 issued a circular allowing banks to recognize the overheads recovery rate into the cost of funds. The circular essentially, require thel DMBs to develop an all-inclusive risk-based interest rate pricing model, quote lending rates as fixed spread over the Monetary Policy Rate (MPR) or any reference rate as may be determined by the CBN and help to drive down the persisting lending rates. The circular identified direct cost of Funds (interest expense), indirect cost/overhead (salaries, other cots), statutory cost (NDIC premium, Cash Reserve Requirement (CRR), opportunity cost of holding liquid assets in excess of the minimum requirement, cost of holding non-earning assets and target return on equity.

Previously, overhead cost included a range of costs that consists of advertising costs, data processing services, software development costs, parts of legal fees, networking information technology and auditing (see Table 1 for sample illustrates overhead costs in banks). But CBN observed that these costs seem to be largely a wrongly articulated pricing model by DMBs that tend to negatively impact on prime lending rates. Accordingly, to ensure an appropriate pricing and setting of rates by DMBs and a broader efficiency cost management and profit expectations, the CBN excluded overhead costs from subsequent modifications to the frameworks for computing the bank's cost of fund.

Recognizing the crucial role of input costs for financial institutions and the resulting impact on profits for most of these institutions, the CBN, has over the years provided various frameworks for determining the bank's cost of funds. It is expected that these guidelines on determining the bank's cost of funds will align with the bank's broader efforts to expand

loan volumes, ensure efficiency, simplify the processes, create opportunities to generate substantial growth prospects for the economy and the banks, and steadily improve shareholder value.

The key objective of the refinement in the definition of cost of funds is for banks to understand precisely the components of cost of funds while maintaining lending standards. It is generally understood that the banks aim at maximizing higher returns and anticipate high credit demands from households and businesses. Evidently, frequent changes in the components of banks' cost of funds could affect retail lending rates and the main sources of profit for the banks.

Figures 1 and 2 further demonstrate the nature of the cost items for banks depicted here as Bank A, B, C and D because of disclosure issues. In Figure 1, it is evident that while bank A has the highest amount of both interest expenses and overhead costs considering the larger volume of deposits of approximately ₦1,238,863 Million among the banks, bank D submitted higher salaries and wages costs than other banks for the period under review (approximately 3,126 million). On the contrary, while bank C submitted a higher Deposit insurance Premium payable during the month, other banks disclosed a lower cost on premium on the purchase of insurance contract from the NDIC. Apparently, the varying cost of funds observed among the banks is not unrelated with the deposit contents in different products within the banks and the capacity of certain banks to provide solution easily at lower cost to meet the customers' needs.

Figure 1: Monthly Cost of Funds in Nigeria (₦'Million)
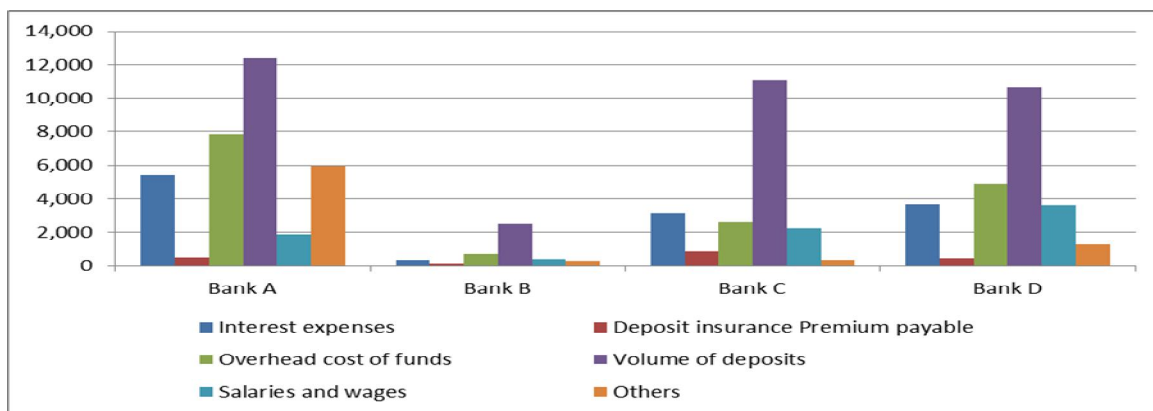
Figure 2: Cost of Funds of Selected Banks in Nigeria
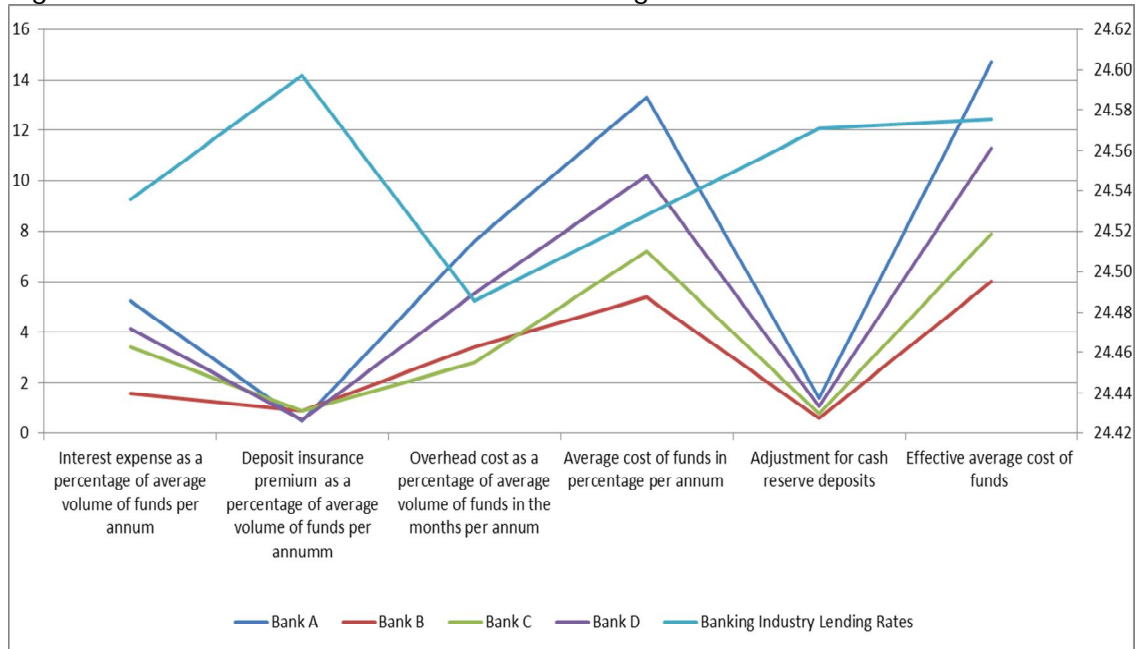
In our examination of the composition of the cost of funds for different banks in Nigeria, we observed some peculiarities and similarities about the banks that could be specific to a bank, specific to the industry or market and may possibly be macroeconomic in nature. It was interesting that lending rate did not show close relationship in line with economic performance.

Figure 3: Components of Banks' Cost of Funds
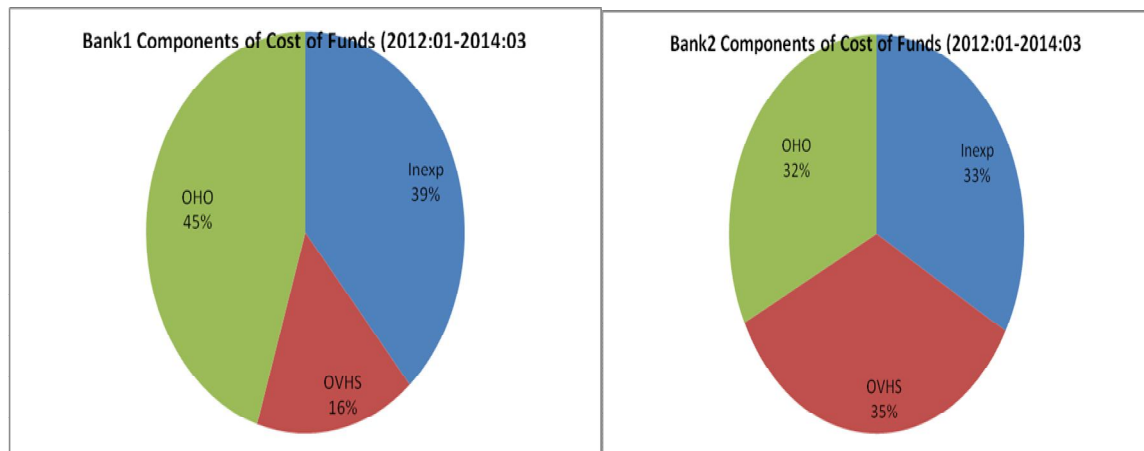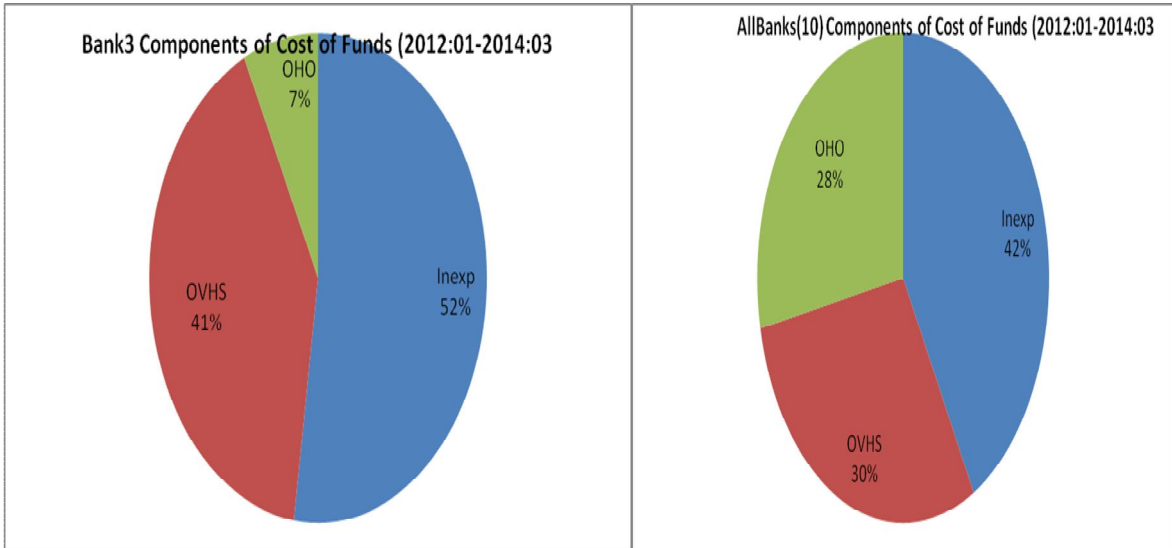
Bank1 shows 45 per cent of cost of funds to be accounted for by other overheads, with interest rate expense and salaries and wages of 39 and 16 per cent, respectively. Bank2, on the other hand, had 35 per cent for salaries and wages as highest with other overheads and interest rate expense of 32 and 33 per cent, respectively. Bank3 reported interest rate expense of 52 per cent as highest. On the average, the 10 banks involved showed interest rate expense of 42 per cent followed by salaries & wages and other overheads by 30 and 28 per cent, respectively.

Figure 4: Bank 1 : WAVCOF, Inflation and Liquidity Ratio, January, 2012 – March, 2014
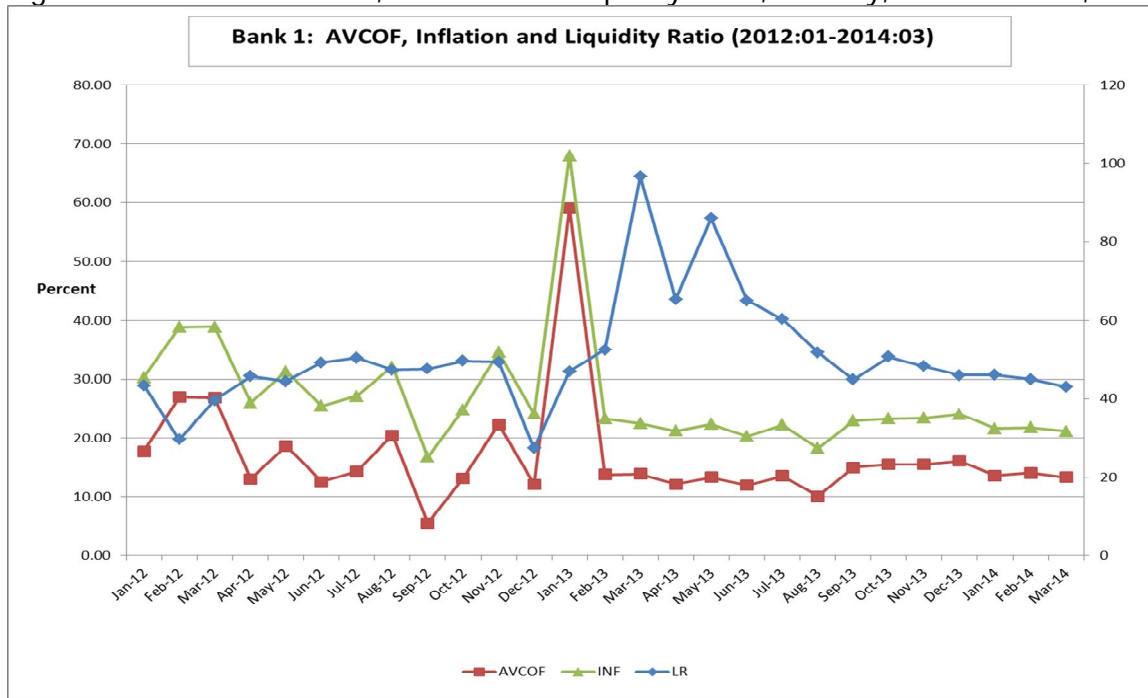
Figure 4 illustrates the nature of the average cost of funds, liquidity ratio and inflation for five selected banks used in the study. The significant features of the nature of the selected bank's cost of funds, is the varying levels of the bank's average cost of funds, inflation rates and the liquidity ratios. In the periods January to November 2012, we observed that bank 1 maintained a lower average cost of funds and liquidity ratio at the beginning of 2012. But immediately after these periods, there was a sharp rise in both the average cost of funds and the liquidity ratio in the period ranging from January to March 2013. But the increase in the liquidity ratio for the bank extended further to the month of July, 2013, before reducing. The average cost of funds of bank 1, however, indicates a lower level of costs throughout the periods after the dramatic rise between January and March 2013.

2.2   CBN Framework for Determining Cost of Funds

Ronald (1978) identified an earlier method of estimating banks' cost of funds as summing up all expenses, incurred including interest, reserve requirement and other expenses less service income charge of borrowing the funds divide by the amount borrowed. This was referred to as average cost method. This is expected to add profit margin for shareholders. However, it is believed that when conditions are changing like rising interest rates, this method could be very unreliable. In this case, the weighted average of marginal cost method was introduced.

Nwaoba (2006) noted that in the 1990s, the framework for the computation of banks' cost of funds included interest rate expense as a percentage of average volume of funds per annum, deposit insurance premium as a percentage of average volume of funds per annum and adjustment for cash reserve deposit.

In the recent CBN's Monetary, Credit, Foreign Trade and Exchange Policy Guidelines for the fiscal years 2014/2015, banks are guided in the computation of their cost of funds by employing the weighted average cost of funds computation method. For the application of the cost items, according to the CBN guidelines, banks should include banks' interest cost on the different types of deposit liabilities, borrowings from the inter-bank funds market, payments in respect of deposit insurance premium and costs due to reserve requirements.

Generally, companies calculate their overall cost of funds as (proportion of debt capital X cost of debt capital) + (proportion of equity capital X cost of equity capital). The overall cost of capital is also referred to as the weighted average cost of capital (Drug, 2000). Thus, the CBN has directed DMBs to employ the weighted cost of funds computation method to calculate their cost of funds from 2002. It is believed that the ratio of the amount paid as interest in a month to the average amount of funds mobilized in that month represents the weighted average cost of funds ratio (Nwaoba, 2006).

Table1: A Sample of Computation of Cost of Funds in Nigeria (31-03-2014)

S/N	Details	Bank A	Bank B	Bank C	Bank D
1	Volume of deposits i.e Average of opening and closing balances (₦'. Million)	1,238,863	251,896	1,104,119	1,065,276
2	Interest expenses for the month (₦'Million)	5,400	333.33	3,136	3,689
3	Deposit insurance Premium payable during the month (₦'. Million)	500	99.8	862	469
4	Overhead cost of funds in the month (₦'. Million)	7,866	708	2,610	4,911
4.1	Salaries and wages	1,896	388	2,256	3,612
4.2	Others	5,970	320	354	1,299
5	Interest expense (2) as a percentage of average volume of funds per annum	5.23	1.58	3.41	4.15
6	Deposit insurance premium (3) as a percentage of average volume of funds per annumm	0.48	0.47	0.99	0.52
7	Overhead cost (4) as a percentage of average volume of funds in the months per annum	7.62	3.37	2.83	5.53
8	Average cost of funds in percentage per annum (5+6+7)	13.33	5.43	7.23	10.20
9	Adjustment for cash reserve deposits	0.20	0.03	0.14	0.13
10	Effective average cost of funds (8+9)	13.53	5.46	7.37	10.33

Source: e-FASS (Monthly Returns by Banks) Banking Supervision Department, CBN.

3.0 Literature Review, Conceptual and Theoretical Framework

3.1 Literature Review

There is a growing body of empirical research on banks' cost of funds. This comprises studies that have attempted to identify the composition of cost of funds, assess its determinants, and evaluate the transmission of cost of funds to lending rates as well as, propose strategies for lowering cost of funds. Some of the studies include Nwaoba (2006), Accenture (2008), Al-Jarrah (2010), Raknerud, Bjorn and Ketil (2011), Deans and Stewart 2012 and Kroszner (2013).

Deans and Stewart (2012) showed that changes in banks' funding costs banks in Australia heavily and this was in line with the cash rate until the global financial crises when variations were observed. The authors also observed increased spread between lending rates and cash rates for all loan types. However, the increases varied across loan types, suggesting consideration of riskiness in setting lending rates. Some important conclusions of this study are; (i) banks' funding costs transmit to lending rates, (ii)the Federal reserve take into account factors like risk premia and competitive pressures in setting cash rates; (iii) funding costs differ across banks.

The literature has classified determinants of cost of funds into three broad categories. These are firm or bank specific, industry and macro specific characteristics. Bank-specific features include ownership structure, bank size, deposit volume, loan portfolio, overhead costs, capital adequacy, operating costs, share of liquid and fixed assets, (Moore and Graigwell, 2000; Robinson, 2002; Crowley, 2007; Folawewo and Tennant, 2008). Industry specific characteristics include, level of competition/market power, degree of development of the banking sector, taxes and reserve requirements (Fry, 1995 and Cho 1998). Cho (1998) argues that constratints such as the absence of functioning equity markets have substantial effects on the efficient allocation of resources by the banking sector. This according to Fry (1995) further exposes the banks to huge financial risks. Macroeconomic variables include inflation, growth of output, exchange rates and money market real interest rates. The macroeconomic environment affects the performance of the banking system. Cukierman and Hercowitz (1990) argued that inflation expectations correlate with the degree of market power measured as the spread between deposit and lending rates. Largely, the literature provides evidence that the macroeconomic environment has substantial impact on banks' performance and setting of lending rates.

Al-Jarrah (2010) argued that bank specific variables such as capital adequacy ratio and total asset ratios mainly capital were the major determinants of high interest margins in Jordan, using data series from 2001 to 2008. The author employed the Ho and Saunders model which assumes a bank as a risk-averse dealer in the loan and deposit market. An interesting dimension introduced into the model is the use of control variables such as inflation, economic growth, etc along with bank-specific characteristics. The bank specific

variables were found significant in determining interest margins set by banks in Jordan. The author recommended an expansion of deregulation efforts with a view to promoting market competitiveness. Similar arguments are presented by Maudos and Solis (2009) using the same model to study Mexico's banking industry. Their results demonstrate that high interest margins can be explained mainly by banks' average operating costs and market power though the non-interest income had increased over the years.

Kroszner, (2012) provided clarity on the debates regarding cost of funds differentials using descriptive statistics. The study demonstrates that factors such as the size of the bank, Cash Rate, level of advancement of infrastructure, overhead costs, etc, determined banks' funding costs as well as lending rates charged on various classes of loans. On the linkage between cost of funds and lending rates, Raknerud, Bjorn and Ketil (2011) investigated the issues for Norwegian banks. The authors categorized the banks into two groups: customer deposits and long-term wholesale funding i.e market funding from private and institutional investors including other banks. Cost of funding was represented by the three-month Norwegian Interbank offered Rate (NIBOR) and the spread of unsecured senior bonds issued by Norwegian banks. The findings suggest that a unit increase in NIBOR results in about 0.8 increase in bank rates.

Measures of reducing cost of funds have also been examined in the literature. The prominent arguments are that (i) cost-cutting efforts differ from bank to bank. (ii) Banks that pursue only traditional cost reduction programs tend to achieve cost benefits fast, but are unable to sustain the efforts in the long-run. (iii) short-term cost reduction efforts should be balanced with long-term strategies for improvement in banks' performance. In particular, Accenture (2008) argued that cost reduction should be approached as part of a broader efficiency plan with the aim of balancing short-term cost reduction strategies with longer-term initiatives. This approach has the potential of improving banks' performance. Accenture (2008) documented six key methods that high performance banks cut cost and enhance efficiency; (1) Minimize management layers; (2) Significantly reduce product portfolio; (3) Utilise off-shore services and outsourcing of procurement and control external expenditures; (4) minimize process duplication; (5) Increase customer self-service; and (6) simplify technical infrastructure.

Studies on Nigeria relating to banks' cost of funds discussed mainly determinants and interest rate spread (Nwaoba 2006; Folawewo and Tennant, 2008 and Haruna 2011). Nwaoba (2006) examined the determinants of cost of funds by DMBs in Nigeria. The author specified a macro model that takes into account factors that influence banks' cost of funds in Nigeria. The model considered variables such as, CRR, money supply, growth in bank credit, liquidity ratio, credit risk of borrowers, prime lending rate, real GDP, etc. The estimation results indicated that CRR, prime lending rate, growth in bank credit money supply and growth in liquidity ratio were important determinants of cost of funds. He concluded that high cost of funds is mainly driven by scarcity of loanable funds in the banking system. Similar arguments are presented by Haruna 2011 and Folawewo and Tennant 2008). They however extended previous works by including banks specific features in explaining the determinants of interest rate spread in Nigeria.

The current research extends and updates the literature on the subject for Nigeria. It differs from previous works by developing a micro pricing model that takes into account individual characteristics of various DMBs, industry features and macroeconomic characteristics in Nigeria. This follows from the literature review which suggests that these features contribute towards determining cost of funds. The study also examines strategies for lowering cost of funds with a view to lowering lending rates in Nigeria.

3.2   Conceptual Framework

Some of the concepts discussed here include Cost of Funds (direct costs and indirect Costs); Average cost of funds; Net interest margin, reserve requirement and non-interest income.

3.2.1 Cost of funds

The monetary, credit, foreign trade and exchange policy guidelines of the CBN for fiscal years 2012/2013 outlined the framework for determining bank's cost of funds, applicable items to include banks' interest cost on the different types of deposit liabilities, borrowings from the inter-bank funds market, payments in respect of deposit insurance premium and costs due to reserve requirements. Cost of funds is calculated as the total interest expense annualized, divided by average interest bearing deposits and other interest bearing borrowings, plus average non-interest bearing checking deposits. It is the interest rate paid by financial institutions for the funds they deploy in their business and constitutes one of

the most important input costs for a financial institution. A lower cost will generate better returns when the funds are deployed in the form of short-term and long-term loans to borrowers (Drury 2000 and Mouck1997). The spread between the cost of funds and the interest rate charged to borrowers represents one of the main sources of profit for most financial institutions. Two broad classification of cost of funds are identified in the literature. These are direct and indirect costs. Attempt is made in the ensuing sections to provide explanation for both concepts.

3.2.2 Direct Cost of Funds

The direct cost of funds is the interest expense incurred by banks for raising short-term and long-term wholesale funds through debt. It is also the coupon the issuing bank pays on the bonds issued to investors and other economic agents. Issuing banks pay some form of compensation to investors for the credit risk of the issuer[5], and this is also regarded as a direct cost of fund. The market price of bonds in the secondary market is often regarded as an indicator of the direct cost of raising such instrument. In addition to the secondary market price, an issuer also pays a small 'new issue premium' in order to issue additional debt instrument and attract more investors.

3.2.3 Indirect cost of funds

Indirect cost of funds refers to other costs incurred by banks in the process of issuing debt. These include fees paid for registration of bonds, insurance fees, rating agency fees, legal charges, among others. In the literature, expenses like overhead costs (salaries and wages), cost of providing security, handling funds, electricity bills and others are also classified as indirect costs (Nwaoba 2006; Accenture 2008).   The literature also identified other indirect costs associated with covered bonds and mortgage-backed securities, such as, cost of the 'in-built' swaps.

3.2.4 Net Interest Margin

The net interest margin is the difference between the interest that a lender receives on all loans and the interest it pays on all funding of those loans divided by total loans. It is measured as a difference between lending and deposit rates. In the literature, net interest margin is commonly regarded as an acceptable measure of financial intermediation, as well

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[5] That is, the risk that the issuer may not repay and the investors will lose their money.

as cost of funds. It is often used as a proxy for cost of funds in related estimations (Jayaratne and Strahan, 1996; Rajan and Zingales, 1998; Beck, et al (2000). Net interest margin is commonly expressed as the difference between the average lending rate and average deposit rates.

3.2.5 Non-interest Income

This refers to banks' earnings from non-traditional banking activities such as fees, licensing, insurance among others. These enter into the composition of interest margins for banks.

3.2.6 Reserve Requirement Costs

Banks are required to hold a fraction of deposits in the central bank at zero rates. This constitutes some cost to the banks since they pay a market interest rate to depositors on the reserves. The cost is usually passed to customers by widening the interest margin. Illustrated below is a chart describing the various composition of cost of funds. It provides graphics and context for the specification of the model employed in the study.

Figure3: Description of Cost of Funds
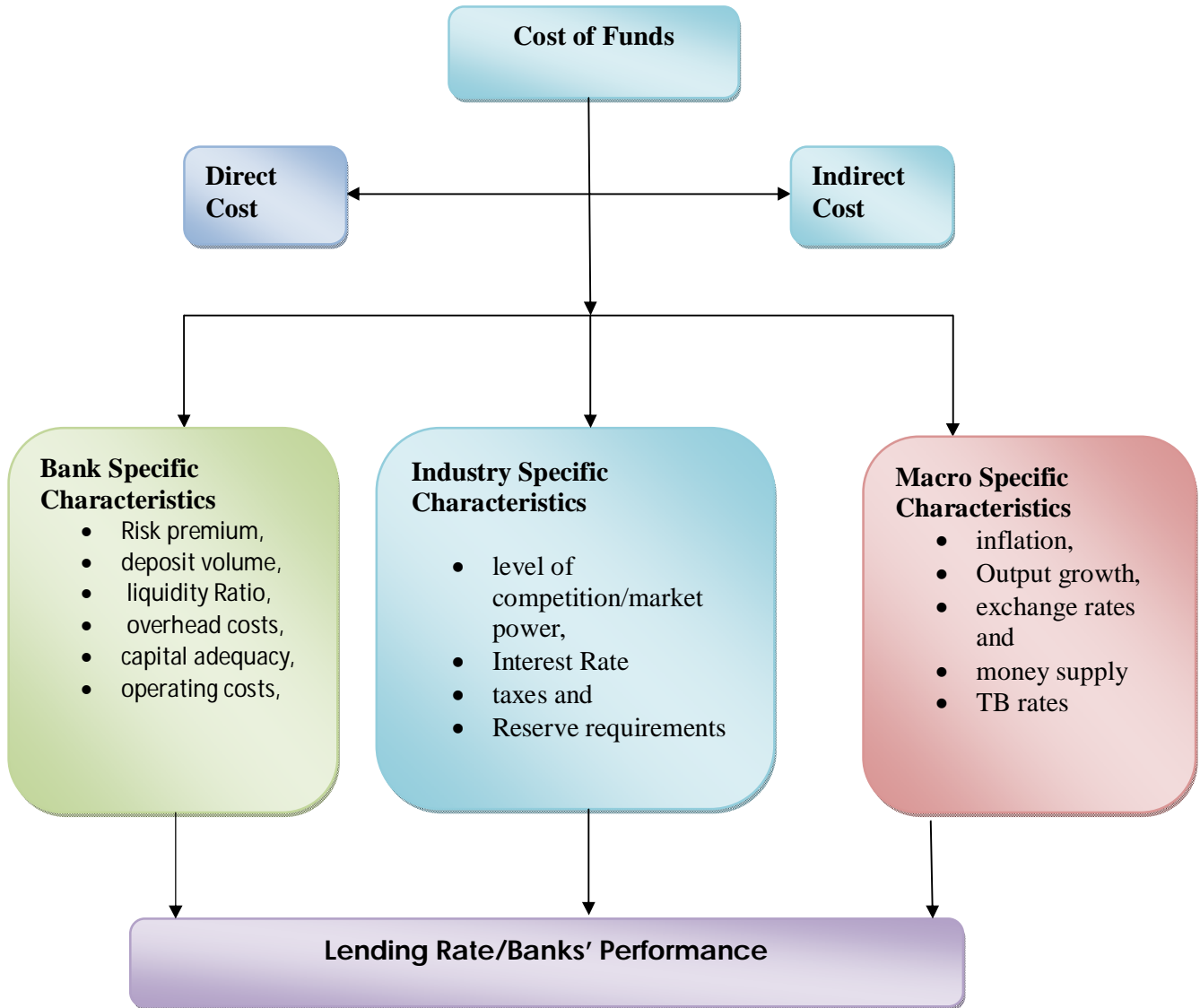
3.3   Theoretical Framework

Various definitions of cost of fund exist but it has been commonly described as net income margin (NIM). NIM is computed as the ratio of total interest earnings less interest paid to total loans. While Naceur (2003) defines NIM as net interest income divided by total assets. Bakhe (2010) defines it as (interest on deposits plus interests on borrowings) divided by (total deposits plus total borrowings). In other words, it is the difference between banks' earnings from interest bearing activities and the costs incurred for attracting interest bearing funds. This is represented by the following equation.

$$(i_L - i_D)_{it} = \alpha_0 + \beta_0 (\varphi^* i_L)_{it} + \beta_1 \left(\frac{OPC}{D} \right)_{it} + \beta_2 (RiPr)_{it}$$

$$+ \beta_3 \left(\frac{As}{D} - \frac{NII}{D} \right)_{it} \beta_4 Infl_{it} + \beta_5 TBR_{it} + \varepsilon_{it}$$

(5)

Where:

TBR= Treasury Bill rates,

Infl= Inflation rates

Other variables are as previously defined.

Wicksell(1893) developed the loanable funds theory of the rate of interest which has been considered as significant to the interest rates and theory of cost of funds. This theory permits us to explore the causes of increasing or decreasing interest rates and to evaluate the wisdom of policy measures that can be designed to influence credit in a given economy. This theory postulates that interest rates are determined by the supply and demand of loanable funds in the financial markets

$$r = f \left(\sum_{t=1}^{n} SL_t + \sum_{1}^{n} DL_t \right) \qquad \dots \qquad (1)$$

Where DL is demand for loanable fund and SL is supply for loanable funds. The theory postulates that the intersection of the supply and demand for loanable funds determines the interest rate and by extension cost of funds. We use the positions of net interest margin and loanable funds for this study.

Thus, $r = COF = f \left(\sum_{t=1}^{n} SL_t + \sum_{t=1}^{n} DL_t \right) \qquad \dots \qquad (2)$

Where:

  r = interest rate

  COF = cost of fund

Given that cost of fund may be driven by the bank specific, industry and macroeconomic variables, we could state that:

$COF = f \left(\sum_{t=1}^{n} SL_t + \sum_{t=1}^{n} DL_t \right) =$ (B+I + M)   ...   (3)

Where, B(bank specifics) = (Risk premium, deposit volume, liquidity Ratio, overhead costs, capital adequacy, operating costs)

I (industry specifics) = (Interest Rate, taxes and reserve requirements)

M (macroeconomic variables) = (inflation, Output growth, exchange rates and money supply, treasury bills)

This identity can be represented as:

$$\left(\sum_{t=1}^{n} SL_t + \sum_{t=1}^{n} DL_t\right) = (rp + dv + lr + ovc + cad + opc + ir + tx + rr + infl + og + exchr + ms + tb) \quad\ldots \qquad (4)$$

The weighted cost of fund can therefore be stated as thus:

$$Wcof = \left(\sum_{t=1}^{n} SL_t + \sum_{t=1}^{n} DL_t\right) \qquad \ldots \qquad\qquad (5)$$

4.0   Econometric Analysis

4.1   Data and Description of Variables

The data used in the estimation include banks specific variables: total cost of funds; interest expense; NDIC premium, overheads on wages and salaries; maximum lending rate; Industry specific variables: liquidity ratio, profitability, CRR and macroeconomic variables such as money supply and inflation rate. Industry-specific and macroeconomic variables are included to control for the cyclical fluctuations that would affect cost of funds in Nigeria. The Monthly data of 10 selected deposit money banks from January 2012 to March 2014 is employed in the study. This period is chosen based primarily on data availability. The data is sourced from the CBN database. The data witnessed some transformations including scaling, differencing and lagging to contain some technical econometric problems.

Table 2: Description of Variables

Classification	Variables	Definitions	A priori Expectations
Bank Specific	Operating Cost	Defined as non-interest expense/Total earning assets	Higher operating costs should increase cost of funds, hence a positive relationship is expected.
	Risk Premium	This is the difference between maximum lending rate and prime lending rate.	Positive relationship with cost of funds
	Overhead Costs	These costs are divided into salaries and wages and other costs	They have positive relationships with cost of funds
Industry Specific	Liquidity Ratio	Total specified liquidity assets expressed as percentage of total current liabilities	Negative relationship
	Cash Reserve Ratio	Percentage of total deposit liabilities that should be kept with the central bank	Positive relationship
Macroeconomic Specific	Money Supply	Broad money supply	Rising money supply should reduce interest expense, so negative relationship is expected
	Inflation Rate	Annual Inflation Rate. Generated from the CPI	This captures business cycle effects and should have a positive relationship with cost of funds

4.2 Methodology

The data contains time series and cross sectional properties. This necessitates the use of panel data strategy in estimating the model. The panel technique is known to yield better results given the increase in sample size and the capacity to minimize problems arising from degrees of freedom. It also increases variability and minimizes the problem of multicollinearity, aggregation bias and endogeneity problems. More importantly, it better captures individual banks characteristics and enhances the understanding of individual bank's characteristics and how these contribute to funding costs. This is particularly important considering that banks are heterogeneous. Pooled and random effects models were estimated for purposes of comparison but not reported. Overall, the study used the panel generalized method of moments "GMM" to estimate the two models because of associated econometric problems that could be eminent from dynamic specifications including endogeneity and cross sectional heterogeneity (Gregoriou et al, 2009). The pooled regression or population averaged model is used with assumptions of error term as follows:

$$y_{it} = \alpha + X_{it}\beta + \varepsilon_{it}$$

➤ Zero conditional mean of ε_{it}

- ➤ Homoscedasticity (constant variance of error term)

- ➤ Independence across observations and strict exogeneity of X_{it}

Random effect model assumes that variation across entities is random and uncorrelated with independent variables in the model. Thus, if differences across entities have effect on dependent variable random effect becomes appropriate. The random effect model with ε_{it} as within entity error and u_{it} as between entity error is:

$$y_{it} = \beta X_{it} + \alpha_i + u_{it} + \varepsilon_{it}$$

The model also allows the generalization of inferences beyond the sample size used in the model (Oscar, 2007).

The generalized method of moment estimation is of the form:

$$y_{it} = y_{i(t-1)} + \beta X_{it} + n_i + v_{it}$$

The GMM specification involves instruments applying weighting matrix and then estimation. Arellano-Bond (1991) suggested transforming the model into difference using md = 0.5(T-1)(T-2) moment conditions, $E(z_{it}\Box u_t)=0$, z_{it} is a (T-2) x M_d instrument matrix and $\Box u$ is a (T-2) column vector of residuals for the first difference equation of individuals. Another moment condition is $E(u_{it}\Box y_t) = 0$. These condition hold when the process is mean stationary. Other moment conditions depend on whether the explanatory variables are strictly exogenous, weakly exogenous or endogenous. Hasen J-statistic is used to confirm validity of the instruments. First step Generalized Method of Moments (GMM) has been used.

4.3 Model Specification

The study models variations in bank funding costs as a function of changes and levels of balance sheet and macro financial variables. The specification considers three broad classifications of the determinants of cost of funds. These include macroeconomic industry/market specific and firm specific classifications. Based on the theoretical framework transforming equation (5) to yields equation (6) which represents the variables used in the study as follows;

$$Wcof = \alpha_4 + \alpha_2 \, Wcof(-1) + \alpha_3 in\exp + \alpha_4 lr + \alpha_5 \inf + \alpha_6 ovhs + \alpha_7 oho + \alpha_8 inmlr + \alpha_9 m2 + u_i - (6)$$

In addition, equation (7) is also estimated to show the contribution of the identified variable to profits of the banking system. This is a modification of the profit model for India by Rakhe (2010).

$$\pi_{it} = c + \sum_{k=1}^{k} \beta_k X_{it}^{k} + \varepsilon_{it}, where \varepsilon_{it} = v_i + u_{it}$$

C is constant term, ε_{it} is the disturbance term with v_t the unobserved bank specific effect and u_{it} the idiosyncratic error. The estimable form of the model is as follows:

$$prof = \alpha_1 + \alpha_2 prof(-1) + \alpha_3 in \exp + \alpha_4 lr + \alpha_5 \inf + \alpha_6 ovhs + \alpha_7 oho + \alpha_8 crr + \alpha_9 m2 + U_i ....(7)$$

Where *wcof* refers to weighted cost of funds, *inexp* is the interest expense, *ovhs* is the overheads salaries, *oho* refers to other overheads. inf is the inflation and *Lr* is the liquidity ratio. *Inmlr* is the maximum lending rate and prof is the profitability.

Equations (6) and (7) are therefore estimated to identify the determinants of banks cost of funds.

4.4 Summary Statistics

	AVCOF	CRR	DEP	INEXP	INF	INMLR	LR	M2	NDICPR	OHO	OVHS	PROF	RKPM
Mean	13.80137	11.44444	818370.3	2866.745	10.0963	24.32333	50.84667	14.63451	765.3981	1931.349	2032.407	186.6546	7.555185
Median	10.87462	12	687584.7	3045.847	9.1	24.58	47.59	14.73488	433.0394	1511.072	1709.818	187.5244	7.91
Maximum	60.5814	15	2524723	9774.616	12.9	25.83	96.61	15.69968	10773.41	46880.18	9842.623	190.9617	9.11
Minimum	3.237967	8	170784.1	-319.732	7.7	22.31	27.39	13.15379	-0.006	-9628.35	-986.176	172.3	5.7
Std. Dev.	10.42111	2.064631	587608.4	2102.183	1.995624	0.870482	14.04656	0.882436	1419.377	3519.015	1726.346	4.283015	0.949182
Skewness	2.561362	-0.4539	1.168052	0.293649	0.191567	-0.37274	1.610274	-0.31233	4.530877	7.635235	1.663234	-2.05894	-0.54816
Kurtosis	10.10507	2.72235	3.862318	2.468046	1.281757	2.478308	6.25597	1.59332	25.74417	100.8215	6.144013	7.11076	2.071226
Jarque-Bei	863.1491	10.13842	69.76095	7.063801	34.86545	9.313752	235.9493	26.65071	6743.395	110275	235.6899	380.8711	23.22598
Probability	0	0.006287	0	0.029249	0	0.009496	0	0.000002	0	0	0	0	0.000009
Sum	3726.369	3090	2.21E+08	774021.2	2726	6567.3	13728.6	3951.318	206657.5	521464.1	548749.8	50396.74	2039.9
Sum Sq. Di	29213.28	1146.667	9.29E+13	1.19E+09	1071.296	203.832	53075.24	209.4684	5.42E+08	3.33E+09	8.02E+08	4934.595	242.3547
Observatic	270	270	270	270	270	270	270	270	270	270	270	270	270

Summary statistic shows that the data series are not normally distributed based on jarque bera statistic, skewness and kurtosis. However, having a cursory look at the mean and median, reveals closeness for all the variables involved.

4.5 Panel Unit Root Test

Following Imet al (2003) approach, the study utilized the popular ADF procedure of Dickey and Fuller (1979) to test the unit root. The result of the unit root is contained in the Table 3.

Table 3: Panel Unit Root Test Results

Variable	Assume Common Unit Process	Assume Individual Unit Process		
	Levin, Lin & Chu t	Lm, Pesaran, Shin w-stat	ADF - Fisher, Chi-Square	PP - Fisher, Chi - Square
Wcof	-2.22*	-3.07	49.51	72.71
CRR	0.001*	0.99	8.67	7.52
DEP	-1.32***	-2.11*	47.38*	40.38*
INEXP	-2.37*	-2.28*	36.11*	52.18*
INF	-7.38*	-8.19*	101.05*	190.24*
INMLR	-13.13*	-11.54	147.48	332.94
LR	1.42	-1.54***	24.18	53.85*
M2	-1.44***	-0.07	13.86	5.82
NDICPR	-0.79	-2.87*	45.98*	69.06*
OHO	0.45	-2.15*	50.70*	75.3*
OVHS	-4.24*	-4.47*	61.84*	92.26*
PROF	-2.49*	-4.29*	51.44*	32.3
RKPM	-10.15*	-9.62*	120.58*	269.72*
TCR	-3.32*	0.89	4.05	11.18
*, ** and *** are significant at 1%, 5% and 10%, respectively.				
wCOF is weighted average cost of funds; CRR refers to cash reserve requirement; Dep is the deposits; INEXP is the interest expense; INF is the inflation; inmlr refers to maximum lending rate; M2 is money supply, ndicpr is NDIC premium, OHO is other overheads, OVHS is the overheads salaries, TCR is total r=credit and RKPM referring to risk premium.				

4.6   Cointegration Analysis

Since some variables are stationary at levels and others at first difference, the next step is to test if a long run relationship (cointegration) exists among the variables. Cointegration analysis are sensitive to lag length procedures, thus, an automatic lag length selection based on SIC with a maximum lag length of 6 was employed. The result of the cointegration test established the presence of cointegration relationship among the series. The null hypothesis of no coinegrating relationship was rejected at 5% significance level.

4.7   Panel Regression Results

Panel estimation of pooled, random effect and fixed effect model estimations were carried out but not reported, which revealed some technical problems and non-appropriateness of any of them. In this situation, Generalized Method of Moment approach was adopted (see table 4). Two dependent variables are identified to evaluate determinants of weighted banks' cost of funds models involving weighted cost of funds and profitability among banks.

On the whole, the models estimated performed fairly well after appropriate transformation and techniques. Most of the coefficients are significant at the conventional levels, the GMM models addressed the problems of endogeneity and cross sectional heterogeneity.

4.7.1 Determinants of Weighted Banks' Cost of Funds

After comparing the three estimations based on OLS method, the Generalized Method of Moments (GMM) is used to contain several econometric problems associated with dynamic specifications such as endogeneity and cross sectional heterogeneity as suggested by Arellano and Bond (1991). First step GMM model is used although second Step GMM is more efficient because of small sample size that is more efficient with first step GMM (Loca and Spatafora, 2012). The GMM estimation results revealed that rising inflation interest rate, interest expense, liquidity ratio, including overheads cost comprising wages and salaries and infrastructure put pressures on banks cost of funds in Nigeria. The Hasen J-statistic was computed following the procedure of the Bank of England (2001) by multiplying the number of observations by the J-statistic. The results confirmed the validity of the instruments used as well as the absence of autocorrelation as indicated by Arellano-Bond serial correlation. The relevant sections of the result are presented in Table 4 below.

Table 4: Presentation of Estimation Results

Dependent Variable	Weighted Banks' Cost of Funds (dwcof)	Profitability (dprof)	
Explanatory Variables	GMM/DPD	Explanatory Variable	GMM/DPD
DWCOF(-1)	0.12*	Prof(-1)	-0.05*
INF	0.82**	Wcof(-1)	-0.03***
DINEXP(-1)	0.001***	Inf(-1)	-0.41*
LR(-1)	0.37***	Ovhs(-1)	0.002**
DM2(-1)	-9.08***	Rkpm(-1)	1.76*
DOHO	0.001*	M2(-1)	-0.71*
DOVHS	0.003*	Lr(-1)	-0.0008*
RKPM(-1)	1.30	Crr(-1)	-0.12*
		Inexp	
		Oho	-0.001*
C		C	
J-Statistic	4.55		0.09675
Arellano-Bond serial Correlation	AR(1)=0.82 AR(2)=0.06		AR(1)=0.06 AR(2)=0.90
Observations	240	260	260
No. of banks	10	10	10

Source: compiled by authors
Note: * represents significance at 1%, ** Indicates significance at 5%; *** indicates significance at 10%.
Eviews J-statistic is multiplied by the number of observations to obtain Hansen's J-statistic

4.7.2 Determinants of Banks' Profitability in Nigeria

The pooled and random effects models were estimated, which reflected evidence of serial correlation and the problem of endogeneity. So, using 1st step differenced GMM estimation procedure, the result showed some improvements. It revealed that reduction in banks' cost of funds will increase profits. Similarly, reduction in overheads generally including salaries and infrastructure is associated with rising profit. Reduction in money supply is anticipated to increase profits because interest rates are also expected to decline reducing interest expense. Liquidity ratio showed negative relationship with profit indicating probably that the more liquid banking system is, the lower the interest expense leading to higher profitability. Reduction in Inflation is expected to increase profit, which is consistent with the positive relationship between inflation and banks' weighted cost of funds. Rakhe (2010) also observed that rising inflation negatively affects profit in India. In this situation, to lower banks' cost of funds, there should be deliberate efforts to reduce inflation in Nigeria. Rising risk premium is associated with high profits, while for weighted banks' cost of funds, it was discovered that higher risk premium goes along with higher cost of fund.

4.7.3 Policy Implications

The descriptive and quantitative analyses have identified key determinants of weighted cost of funds to include interest rate expense, inflation rate, liquidity ratio, overheads (salaries and wages), money supply, other overheads (cost of liquid assets, cost of energy, contributions etc) and cash reserve requirement, This implies that the Bank should continue to pursue low and stable inflation, intensify its efforts at providing shared service programme/schemes for the banking sector. There is the need to deepen financial markets by the Bank through the introduction of more market instruments to lower interest rate expenses. Rising cost on energy for the banking sector requires that there should be combined efforts of the Bank and Government to facilitate infrastructural development particularly, power, oils and Gas sector. The recognition of risk premium as part of cost of funds requires that efforts are needed to narrow the spread between prime and maximum lending rates in Nigeria.

The study also identified that in determination of cost of funds banks consider all expenses (interest and non-interest expenses). The CBN should monitor implementation of its circular of April, 2010, which states components of cost of funds for banks in Nigeria.

5.0   Recommendations and Conclusion

In order to identify strategies for lowering banks' cost of funds in Nigeria, the paper tried to find determinants or drivers of cost of funds through estimation of weighted cost of funds and profit equations of the Nigerian banks. The panel regression used balanced data involving 10 banks. Having gone through the descriptive and econometric analyses, the following strategies are recommended to lower banks' cost funds:

1. Central Bank of Nigeria and Federal Government should sustain their interventions in the key sectors of the economy to reduce overheads costs through development of infrastructure in the country.

2. The Bank should intensify its efforts at promoting shared service schemes among DMBs to reduce cost of operations for banks, such as cost of energy

3. The CBN should have a policy that will not allow any bank to transfer its financial recklessness to consumer, making evidence of cost effectiveness a condition to have subsidiaries and distribution of dividends.

4. Further liberalization of financial market through financial inclusion and introduction of more instruments to diversify sources of funding to reduce interest expense for banks

5. The Bank should continue to pursue low and stable inflation so as to encourage savings and also reduce cost of operations

6. The CBN should make efforts to narrow the spread between maximum and lending rates including de-risking banking sector to reduce risk premium.

7. The interest rate subsidy provided by the Bank to some sectors should be sustained to affect interest rate generally.

8. The CBN should sustain and improve on its drive to ensure transparency and awareness of banks interest rates to promote healthy competition, which could lower interest rates.

9. The Bank should endeavor to balance the objective of price stability with banks profitability. This is because increased CRR is found to increase cost of funds and lowers profitability

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