Consolidation, Reforms and Profitability of Deposit Money Banks: Evidence from Nigeria

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ABSTRACT
Of all reforms agenda instituted by successive government in Nigeria, the issue of increasing shareholders' fund to N25 billion and the need to comply before 31st December 2005 generated so much controversy especially among the stakeholders and seemed to have left a lasting impact on the structure of banking in the country. This study aimed to determine the effect of consolidation and resulting reforms on practice and conducts of banks using a profit efficiency function generated by adopting the reduced form of the cost efficiency function that replaces the cost variable with a profit variable via a financial intermediation approach covering the period 2005-2014. The study proves that banking sector reform has a positive effect on industry profitability; with the channels of transmissions being level of capitalization, liquidity and network effectiveness. This study also affirms the structure-conduct-performance (SCP) hypothesis when NIM is used as the dependent variable for Nigerian banking, which indicates that the size and structure of some banks confers some advantages in terms of pricing and product leadership. The study also reinforce the importance of adequate capitalization and liquidity. Finally, volatility resulting from macro-economic policies impacts negatively on bank's margin as it affects industry perception and attractiveness of the economy to potential investors. Policy initiatives that signals continuing and sustained government focus on maintain macro-economic stability will contribute to growth of banking and as a consequence the real economy.

JEL Classification:
Keywords: Reforms, Consolidations, Profitability, Risk, Macro economic variables

INTRODUCTION
In the past decade, global financial systems, have experienced dramatic turnaround due to the adoption of financial reform policies. The underlying facts behind the acronym 'financial reform' were deregulation of the financial system, enhancement of the degree of competition, elimination of the imbalances in the financial markets, and improvement of the performance of financial institutions (Galagedera and Edirisuriya, 2005). Subsequently, many emerging economies embraced financial reform in response to internal or external pressure. Internal pressure resulted from fundamental macroeconomic issues while external pressure was exerted by various supranationals and donor agencies such as the International Monetary Fund (IMF) and World Bank (Hossain and Chowdhury, 1996).

To function effectively under this ever changing scenario, monetary authorities are increasingly interested in measuring the performance of banks in terms of profitability, cost efficiency, asset quality and management efficiency to ascertain the impact of instituted financial reform programs on the financial sector and by implication the society at large.

Needless to mention that financial sectors are also interested in dimensioning the impact of reforms on their performance and their competitive position after adopting these reforms in view of significant momentum in financial innovation, and automation created by reforms and resulting consolidation initiatives (Claudia et al., 2004).

It is widely believed that Banks with better performance are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2008). Hence, the impact of banking reforms in form of Consolidation of banks have attracted the interest of academics, professionals, banks stakeholders, financial markets and regulators. Despite this interest, there is limited research investigating the status of the financial performance and the impact of consolidation on the performance landscape in the country. Too little studies were conducted to investigate the status of the Nigerian banking industry's performance and its determinants while some other studies were undertaken to investigate the performance of banks in the light of financial reform. More importantly, the impact banks' sensitivity to risks and its effect on industry profitability also needs to be assessed.

Post Consolidation, the banking sector witnessed unprecedented growth which hindsight seemed like neither the regulatory authorities not the industry itself were prepared for neither was there any effective tools or measures to monitor the industry's explosive growth. The phenomenal growth of banking institutions overstretched the regulatory capacity of the CBN while growing sophistication of designed financial instruments and its usage heightened the risks of malpractices and invariably fraud in the industry. Specifically, mismanagement such as insiders' abuse and poor credit appraisal systems, resulted in the accumulation of unpaid loans and advances, which eventually contributed to the distress situation experienced in the banking system, which culminated in government fostered consolidation exercise of 2005. Today, compared with 2008, banks in Nigeria are more adequately capitalized and their exposures are more controlled. Average sector capital adequacy ratio is now over 20% due to recapitalizations.

Despite the hiccups in 2009, the industry has emerged more robust and the industry still remains one of the fastest growing in-country with double digit spread on its assets and liabilities. Earnings CAGR (Compounded average growth rate) was 32% at FYE2010 (Bismarck Rewane, 2011) and remains one of the most profitable globally with historical margins in the region of 63% and control of over 90% financial savings available also for investments (Agusto Report, 2009). However the recession witnessed since year 2015-2017 and resultant effect have dampened the earnings profile of Nigerian banks as default risk level became elevated due to declining oil price, falling reserves and stunted loan book. Earnings growth in 2017 (c.32%) were largely due to Loan repricing and FX gains from currency trading. Industry ROA for FYE 2017 declined to c. 17.3% due to reduced FX gains owing to return to normalcy since Q3'17 as the effect of the transparency brought by the Investors and Exporters Window (I&E) introduction in April 2017 kick in.

In view of the above, keen interest subsists and debate still on-going among analysts on factors that impact bank performance. What is generally not in doubt is that industry, bank specific, macroeconomic factors and monetary policy affect performance of banks. In theory, economists generally agree that large-scale businesses use economies of scale for competitive advantages. Most empirical works in support of size as a positive factor for bank performance use aggregate data and econometric analysis. However, in terms of micro data on individual bank basis, it is necessary to also validate the theory that bigger banks (by size or capitalization) are better in terms of performance, not only from the point of view of the regulatory authorities who are generally interested in capital adequacy and banking system

soundness but also from the point of view of the shareholders and potential investors who, ultimately, are interested in the returns on their investments (CBN, 2013).

More importantly, bank profitability trend in Nigeria since the liberalization of the financial sector, led to the thinking that investment was most worthwhile in the banking industry. The increase in the number of new entrants to the industry in the late 1980s, 1990s and till date lend credence to this assertion. In view of the role that the banking industry plays in the economy, the regulatory authorities, policy makers, banks' management, and other stakeholders cannot be less interested in the growth, competition and performance statistics of the industry.

Based on Brissimis et al. (2008), there are three interrelated and dominants determinants of bank performance in the current theoretical debate, namely the financial reform, the degree of competition and the risk-taking behavior of banks. These variables have been included in research efforts by different scholars drawing on initial effort of Keeley (1990), who argued that the deregulation of the US banking sector in the 1970s and 1980s increased competition and led to a reduction in monopoly rents thus, worsened performance, to a higher equilibrium risk of failure. These studies have however yielded conflicting and contentious results.

This paper reviews the impact of banking reforms on industry profitability and the impact of industry structure and banks risk-posturing on industry performance. To do this effectively, we attempt a review of the nexus between banking consolidation, other reform efforts and influences of banks risk appetite and balance sheet management on banks' eventual performance and sustainability in the Nigerian banking industry.

This study uses the net interest margin (NIM) as a measure of bank performance. However, unlike, Brissimis et al (2008) which construct a yearly index of competition for each country following a non-structural methodology, this study uses the level of Bank's shareholder's investment or equity to proxy consolidation given significant alteration to the industry capitalization structure post consolidation. The study also analyses the level of concentration (defined in network terms) to measure the competitiveness of the industry and to see how diverse industry competition is or the extent to which individual bank wields market power or control. To effective ascertain the extent of relationship between the reform process and bank performance, the study utilized bank-level over a ten year period which captures the significant period of reform. Finally, to analyze the risk- posturing of banks, we consider three categories of risk, namely credit, liquidity and capital risk.

The rest of this paper proceeds as follows. Section 2 briefly reviews the relevant literature. Section 3 describes the econometric methodology that corresponds to the derivation of bank performance measures; it also discusses the determinants of bank performance and their impact on banks profitability. Section 4 presents the data used and resulting findings from data analysis. Finally, Section 5 concludes.

REVIEW OF LITERATURE

There have been various studies focusing on consolidation induced reforms and performance; however, results from these studies on resultant impacts of financial reform program on profitability have been mixed (Strum and Williams, 2004). Some studies clearly observed improved performance of banks after the adoption of financial reform, while others studies could not ascertain any correlation post banking reform period. The researches on bank performance were initially devoted to the analysis of bank margins. Examples of these studies

include: Greece (Athanasoglou et al., 2008), China (Garcia-Herrero et al., 2009) and Indonesia (Sufian and Habibullah, 2010).

The pioneering paper of Ho and Saunders (1981) has been the theoretical framework for all empirical studies on the determinants of bank margins. The dealership model of Ho and Saunders indicates that the optimum bank interest margin depends on the bank's risk aversion, the size of bank transactions, the variance of the interest rate on deposits and loans, and the degree of market competition (see Hawtrey and Liang, 2008 and Kasman, 2010 for a detailed review of the results in both developed and developing countries). An alternative approach adopted by Naceur and Omran (2010) focused on performance analysis using both net interest margins and return on bank assets and equity with a more eclectic one-step estimation procedure based on a behavioral model of the banking firm. Bank performance is usually expressed in this approach as a function of internal and external determinants. The internal variables commonly used are bank specific determinants and the external variables are related to the economic, financial and institutional environment.

Following from Naceur and Omran (2011); Size (a proxy for consolidation) is included to assess the existence of economies or diseconomies of scale in the banking. The empirical results provide conflicting evidence. Smirlock (1985), and Ben Naceur and Goaied (2008) find a positive and significant relationship between size and bank performance. On the other hand, Kosmidou et al. (2005) find that small UK banks display higher profitability to larger ones over the period in 1998. Kasman (2010) find that a size has a negative and statistically significant impact on the net interest margin on a panel of 431 banks in 39 countries.

Sufian and Habibullah (2010) examined the impact of financial crisis on bank performance, by employing an unbalanced panel of 404 bank year observation for the period 1990-2005. The empirical results suggest that the Asian financial crisis exerts negative and significant impact on Indonesian banks' profitability. In addition, Garcia-Herrero et al. (2009) analysed the main determinants of profitability for Chinese banks by employing a panel data set for 87 banks from 1997-2004. They found that better capitalized banks, with a relatively larger share of deposits, and more X-efficient banks tend to be more profitable. Hence, a less concentrated banking system as well as lower government intervention increases bank profitability. Furthermore, from the macroeconomic variables included, higher real interest rates on loans and inflation appear to foster profitability while the volatility of interest rates reduces it.

When analyzing impact of reform and risk posture on banks performance two different yet complementary approaches are prominent. The first examines the relationship between Banking reform, market power (competition) and bank risk-taking, while the second investigates the direct effect of banking reform on bank performance. Studies in the first approach adjudged as mainly theoretical by Brissimis et al (2008) include Matutes and Vives (2000), an affirmation of Keeley (1990) which focuses on the liabilities side of a bank's statement of financial position, while Bolt and Tieman (2004) reached similar conclusions by examining the assets side. Based on this approach banking reforms which alters level of banks capital requirements is not a Pareto optimal policy for controlling banks' risk-taking incentives except such requirements are considered along side deposit mobilization capabilities (Hellmann et al.(2000)). Diamond and Rajan (2000, 2001) pointed out that the optimal bank capital structure trades off liquidity creation and costs of bank distress. Therefore, banks are fragile during episodes of aggregate liquidity shortages, in which case capital has a strategic role to preventing failure.

However, Allen and Gale (2004), studying a variety of models, suggested a complex and multi-

faceted link. For example, partial-equilibrium models generate a negative trade-off between competition and stability, but other models in form of general equilibrium or Schumpeterian competition require the combination of perfect competition and financial instability.

Boyd et al. (2006) examined two theoretical models, the first pointing to a negative correlation between banks' risk of failure and competition, and the second establishing the opposite result. The fact that the second model was verified empirically on the basis of large US and international samples implies that increased competition does not lead to unstable banking environments.

On the other hand, most studies, including Boyd et al. (2006),which pointed to a negative correlation between banks' risk of failure and competition, all proxy competition by concentration ratios that in many aspects have proved to be limited measures of competition. Other indicators of competition/market power employed include Tobin's q (used by Salas and Saurina, 2003; De Jonghe and Vander Vennet, 2008), the Panzar and Rosse H-statistic (used by Claessens and Laeven, 2004 and Yildirim and Philippatos, 2007) and the Lerner index (see e.g. Angelini and Cetorelli, 2003). This literature lacks a measure of market power that shows how competition evolves over time, and thus during the deregulation process. The Panzar and Rosse H-static model seems the most reliable measure of competition in banking as it ascertain level of competition on the basis of magnitude and sign of derived H-Statistic.

The other theoretical model analysis the direct impact of reforms on bank performance without accounting for its effect through competition and risk-taking, via the use of parametric and non-parametric estimates of bank efficiency and productivity. The results also came out mixed. Hence results are also rather controversial. Indeed, Wheelock and Wilson (1999) examined both the efficiency and total factor productivity of US commercial banks in the 1984–1993 period, coinciding with period of major regulatory reforms. The study found that whilst large banks experienced productivity growth, efficiency declined due to economics of technological change. Variations in results from these studies are largely due to dissimilar measures of performance and samples used. With samples reflecting divergent macroeconomic conditions and reforms prevalent at the time.

While above enumerated studies offer insights into the relationship between reform, market power and banks risk-focus, or between reform and bank performance, it is important that we have a study that focuses on the links in the reform-bank performance chain in order to draw verifiable and informed position.

ECONOMETRIC FRAMEWORK AND METHODOLOGY
Performance Estimation
The models used in this study in the estimation of efficiency – proxied by the determinants of net interest margin are based the two empirical approaches of the dealership model proposed by Ho and Saunders (1981) and its subsequent elucidations. Under the first, the determinants of the net interest margins are explained through a two-step procedure. In the first step, a regression of net interest margins is run on a set of explanatory variables. The resulting constant term in this regression - is the measure of the 'pure' margin. In the second step, the relationship between this 'pure' margin and the variables posited by the theoretical model is analysed. The main advantage of this model is that it allows 'pure' margin to be estimated (kasman et al. (2010) However, this model also requires a time series long enough to be able to estimate the 'pure' margin. An alternative approach is a single-stage regression technique based on a behavioral model of the banking firm in which various potential determinants of the

net interest margin are included. Following Angbazo (1997), Demirguc-Kunt and Huizinga (1999), Drakos (2003), and Maudos and de Guevara (2004), we use single-step estimation approach to analyze the determinants of net interest margin for the Nigerian banking industry. Following the approach commonly used in the literature, we specify net interest margin as a function of: (a) bank-specific variables, such as capitalization, liquidity, and credit risk and market power. (b) Industry - specific characteristic, such as the degree of concentration, and (c) country-specific macroeconomic conditions, such as inflation, short term interest rate, Investment to Gross Domestic Products.

Based on Berger et al. (2000a), bank performance tend to persist over time reflecting impediments to market competition, informational opacity, and sensitivity to macroeconomic shocks. While Garcia-Herrero et al. (2009) points out that potential endogeneity could be a problem when assessing bank profitability determinants analysis on determinants of bank performance may suffer from several sources of inconsistencies, such as highly persistence performance, omitted variables, and endogeneity bias. As larger banks with significant economies of scale may have sufficient resources to provision for their non-performing loans. Thus, a more efficient banks may also find it easier to increase their customer base through a successful advertising campaign and could hire the most skilled personnel thereby enhance their profitability (Garcia-Herrero et al., 2009).

To overcome the concerns associated with pooled OLS results, we introduce a lagged dependent variable in the regression models by employing the Generalized Methods of Moments (GMM) estimator introduced by Arellano and Bond(1991), Arellano and Bover (1995), and Blundell and Bond (1998). The system GMM (see Blundell and Bond, 1998) allows us to control for persistence and endogeneity issues so as to generate consistent estimates. The GMM joins in a single system the regression equations in differences and levels, each one with its set of instrumental variables. By doing so, this study follows Sufiana and Habibullah (2011) in exploring the panel structure of the dataset and controls for unobserved bank specific effects, potential endogeneity problems of the explanatory variables, time specific effects, and the use of lagged dependent variables. Thus, the panel data regression method provides efficient solution and enables valuable inferences to be drawn in respect to the degree of performance of banks over different economic and institutional conditions.

Based on theoretical discussions above we specify our empirical model as below:
Our empirical model is specified as follows:

$$P_{it} = \ _1 + \ _2 BSV_t + \ _3 INDCON_t + \ _4 MAC_t + \ _{it} \tag{1}$$

The performance p of bank i at time t is expressed as a function of: a) bank-specific variables, such as credit, liquidity and capital risk, BSV, b) Industry-specific characteristics, an index of banking industry market power $INDCON$, and c) country-specific macroeconomic conditions, common to all banks MAC such as short term interest rate, ratio of investment to Gross Domestic Product (GDP) and the error term   and the subscripts 'i' and 't' represent individual banks and time period, respectively. Extending Eq. (1) to reflect NIM as the dependent variable in line with the variables described in Table 1, the regression model is formulated as follows:

$$NIM_{it} = \ _1 \ + \ _2 BSV_t + \ _3 INDCON_t + \ _4 MAC_t + \ _{it} \tag{2}$$

where NIM_{it} is the net interest margin of bank i at time t. The NIM is computed as the

difference between interest revenue and interest expense per Naira assets. To ascertain the validity of instruments used in our estimates, we employed Sargan's test of over-identifying restrictions. Using a dynamic panel approach incorporating the lagged value of the dependent variable as part of the regressors we estimate equation (3)

$$NIM_{it} = {}_1NIM_{i,t\ 1} + {}_2BSV_t + {}_3INDCON_t + {}_4MAC_t + {}_{it} \tag{3}$$

The results of present test statistics for the first and second order serial correlations in the error process are presented. Results indicate absence of second order serial correlation as used +instruments are not correlated with the error terms. (Baum et al., 2010). Following Garcia-Herrero et al. (2009) among others, all regressors were instrumented, while the macroeconomic characteristics were treated as exogenous. The definitions and expected signs of bank-specific and country-specific variables are presented in Table 1.

Table 1: Description of the variables

Variables	Description	Notation	Hypothesised Relationship
Dependent Variable			
Net interest margin	Difference between interest revenue and Interest expense per dollar of assets	NIM	
Bank –Specific Determinants			
Capitalization/Capital Risk	equity/total assets	CAP	+
Credit Risk	Loan–loss provisions/Total Loans	CR	+
Liquidity Risk	Liquid Asset/Total assets	LR	+
Industry-specific determinant			
Industrial Concentration (HHI)	Sum of squares of the market shares of all bank (Number of Bank' Branches/ Total Banks Branches)	INDCON	+/-
Macroeconomic determinants			
Short Term Interest Rates	Minimum Rediscount Rate and Monetary Rate	INT	+/-Policy
Investment to GDP	Gross Capital Accumulation	INVGDP	+/-

This table describes the variables used in our profitability analysis to investigate Relationship between Bank's Margin when measured against the determinants of Nigeria banks' performance

Source: Bank-Specific Data were obtained from audited financial statements of surveyed banks during the period.

Macro Data were obtained from various publications of the CBN and Bureau of Statistics.

Theoretical Background for measurement of bank Profitability

Profitability means ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management can make profit by using all the resources available in the market. According to Harward and Upton (1961), profitability is the ability of a given investment to earn a return from its use. However, Profitability is not synonymous to Efficiency. Profitability is an index of efficiency; and is regarded as a measure of efficiency and management guide to greater efficiency. Though, profitability is an important yardstick for measuring the efficiency, the extent of profitability cannot be taken as a final proof of efficiency. Sometimes satisfactory profits can mark inefficiency and conversely, a proper degree of efficiency can be accompanied by an absence of

profit. The net profit figure simply reveals a satisfactory balance between the values receive and value given. From a banking perspective, the change in operational efficiency is merely one of the factors on which profitability of an enterprise largely depends. Thus to understand profitability, it will be useful to understand and measure the effectiveness of the bank by determining its level of efficiency. There are two broad approaches to measuring banking efficiency, profitability and performance. These are the non-structural and structural performance approaches.

Structural Performance Approach
The structural approach is choice-theoretic and, as such, relies on a theoretical model of the banking and a concept of optimization. The older literature applies the traditional microeconomic theory of production to banking firms in much the same way as it is applied to non-financial firms and industries. The newer literature views the bank as a financial intermediary that produces information-intensive financial services that takes on and diversifies risks. Risk diversification is an essential aspect of financial intermediation that is not generally taken into account in traditional applications of production theory (Mester, 1992). For instance, the traditional theory defines a cost function by a unique cost minimizing combination of inputs for any given level of outputs. Thus, the cost function gives the minimum cost of any given output vector without regard to the return risk implied by the cost-minimizing input vector. Ignoring the implied return risk may be appropriate for non-financial firms, but for financial institutions, return risk plays an essential role in maximizing the discounted flow of expected profits.

The traditional structural approach usually relies on the economics of cost minimization or profit maximization, where the performance equation denotes a cost function or a profit function. Occasionally, the structural performance equation denotes a production function. While estimating a production function might tell us if the bank is technically efficient, the study is more interested in economic efficiency, i.e. banking performance, whether, a bank is responding to relative prices in choosing its inputs and outputs to minimize cost and/or to maximize profit, which subsumes technical efficiency. Risk plays no explicit role in these performance estimate although some papers include one or more dimensions of risk in the estimation as control variables. (Berger and Mester, 1997 and 2003)

Non-structural Performance Approach
The non-structural approach applies a variety of financial measures that capture various aspects of performance to compare performance among banks and considers the relationship of performance to investment strategies and other factors namely bank specific, industry specific, quality of regulation and governance structure. For example, the non-structural approach could investigate banking asset market size or profitability by asking how performance measures are correlated with such investment strategies as growing by asset acquisitions at consolidation and the diversification or focus of the bank's product mix. It looks for evidence of agency problems in correlations of performance measures and variables characterizing the quality of banks' governance. Thus, while informal and formal theories may motivate some of these investigations, no general theory of performance provides a unifying framework for these studies.

Methodology for Measuring Banks Performance
Two general methodologies that are commonly used to measure efficiency and performance. They are: parametric approach using econometric techniques; and, nonparametric approach utilising linear programming method. Both differ mainly in how they handle the random error and their assumptions regarding the shape of the efficient frontier. The parametric approach

has the advantage of allowing noise in the measurement of inefficiency. However, the approach needs to specify the functional form for the production, cost or profit function.

Non-parametric is simple and easy to calculate since it does not require specification of functional form (Coelli, 2004). However, it suffers from the drawback that all deviations from the best-practice frontier are attributed to inefficiency since it does not allow for noise to be taken into account. Common parametric methods are the Stochastic Frontier Approach (SFA), the Thick Frontier Approach (TFA) and the Distribution Free Approach (DFA), while the common nonparametric techniques are the Free Disposal Hull analysis (FDH) and the Data Envelopment Analysis (DEA).

It is suggested both parametric and nonparametric techniques are used in order to strengthen the findings and to make the study more robust (Favero & Papi, 1995; Intarachote, 2001; Nghia, 2003; Mohamed, 2003). Ideally, if the majority of the findings from the two different techniques are similar, then one can be sure that the findings are not being driven by chance or luck.

After the type of efficiency and the measurement techniques, a financial service provider must decide which approach to adopt in selecting inputs for desired output before measuring the bank's efficiency. Any decision made, however, will essentially be subject to banks' treatment of the money they received from the depositors as well as the money they extended to the creditors. In relation to this, two main approaches can be found in the literature. They are: the intermediation approach; and, the production approach.
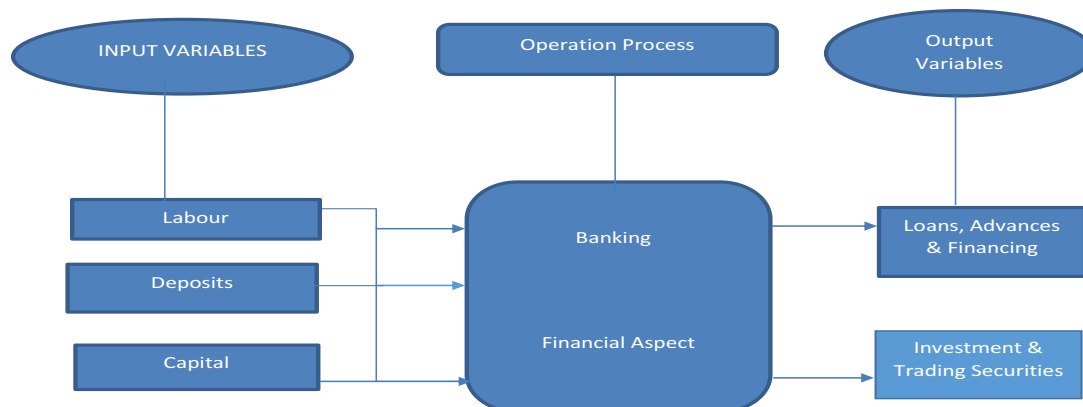
Production Approach
The production approach defines the bank activity as production of services and views the banks as using physical inputs such as labour and capital to provide deposit and loan accounts. While the intermediation approach views banks as the intermediator of financial services and assumes that banks collect deposits, using labour and capital, then intermediate those sources of funds into loans and other earning assets (Sealey & Lindley, 1977). This intermediation approach is argued to be particularly appropriate for banks where most activities consist of turning large deposits and funds purchased from other financial institutions into loans or financing and investments (Favero & Papi, 1995).

Intermediation Approach
In choosing the appropriate approach, Berger and Humphrey (1997) suggested that the intermediation approach is the most appropriate for evaluating the entire bank because it is inclusive of interest expense (income paid to depositors), which often accounts for one-half to two-third of total costs. Meanwhile, he recommended that the production approach is more appropriate for evaluating the efficiency of the bank's branches because branches process customer documents for the banks as a whole.

An example of the intermediation approach is illustrated in Figure 1. In this case, the banking operation process produces joint-outputs. That is to say, banks produced different outputs from the same set of inputs. To give but one example, the same staff, office space and deposits and funds (for brevity, they are called inputs) are used to provide financial assistance to corporate or retail clients. At the same time they are used to conduct other business dealings like investment and trade, which generate returns for the banks and subsequently depositors. This study deploys the intermediation approach to analyzing the determinants of banks profitability.

Source: Alhabshi and Abdullah (2006)
Figure 1: Input-output relationship in banking (intermediation approach)

Measurement of Banks' Profitability
Net Interest Margin
The study employed a financial intermediation approach to measuring banks profitability. Bank's performance is proxied by NIM. NIM is the resulting difference between a bank's total interest expense paid on customers deposit or borrowed funds and interest earned on a bank's risk asset portfolio. NIM is a major indicator of efficiency in financial intermediation, since a high NIM is indicative of the effective maximisation of yield on risk assets and a sensible pricing of interest-bearing liabilities in a bank's book. However, NIM has limited application in investment banking where Non-Interest Income component via Fees are expected to outweigh interest income. As banks move toward more fee-based income generating activities, NIM will decline in importance as a measure of asset profitability.

Bank's Risk Sensitivity
A bank's risk posturing and its risk architecture will usually define its sensitivity to risk and tolerance threshold for deviations from set risk framework. The level of risk a bank is willing to take affected its expected end of period return, To capture the effect of risk on performance the study identifies three broad risk category namely credit, liquidity and capital risk. Poor risk asset quality will usually signals default (increased credit risk) which in turn will affect levels of liquidity (Liquidity risk) and ability to meet depositors calls. Illiquidity usually precedes insolvency[1]. Where the two major causes of bank failures. In periods of uncertainty, financial institutions are usually expected to review their portfolios and hedge risk or diversity portfolio asset mix. Ability to hedge emerging risks will be helped by adequate level of capitalization, which represents hedge against headwinds in financial crises. An adequately capitalized institution will be able to hedge capital risk associated with its loan book. Significant capital buffers will aid a bank's drive to raise liquid holdings in order to reduce credit risk. Expectedly, increased levels of capital (lower capital risk) act as a safety net in the case of adverse developments and therefore are expected to have a positive impact on bank performance. Following similar studies (Sufian and Habibullah, 2012), we use the ratio of loan-loss

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[1] Both are major causes of bank failures.

provisions to total loans (CR) to measure credit risk, the ratio of liquid to total assets (LQ) to proxy liquidity risk and the ratio of total equity to total assets (CAP) to proxy capital risk. More importantly, while a bank's leverage in form of capitalization has been demonstrated to be important in explaining the performance of financial institutions, its impact on bank performance is equally ambiguous. Based on Berger (1995), Lower capital ratios may suggest a relatively risky position, thus we should expect a negative coefficient of this variable. Moreover, an increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy.

Macro/External Control variables
Following the approach adopted by Goddard, et al. (2004); Panayiotis et al. (2005) and Francis (2013), among others on bank efficiency in developed and a few developing economies. In measuring bank profitability, macroeconomic indicators are utilised as inputs and outputs in the estimation process. Applicable control indicators are the ratio of total investment to GDP (INVGDP) as a proxy for fluctuations in economic activity, and a short-term interest rate (IR), which captures the variability of market interest rates and the impact of swings in interest rate structure on banks' profitability. Higher level of interest rate portends well for Banks' earning potential as banks have option in investing loanable funds. Banks would either invest in short term, liquid and risk free government securities or choose to lend directly to the real sector. In a period of high interest rates, banks' lending may actually reduce as banks divert loanable funds into government securities. This has adverse impact on the real sector and will adversely affect level of aggregate demand which may lower the nation's GDP in that given period but the multiplier effect of such action may linger beyond given period. These variables are taken from data published by the National bureau of Statistics and CBN quarterly statistical bulletins.

Estimation and Technique of Analysis
This study employed a panel data estimation approach to measuring profitability, in order to explore both time series and cross-sectional variations in our sample, this follows similar approach by Al-Muharrami et al. (2006). The log specification of these variables was used to reduce any possible simultaneity bias. The choice of the right model for use was selected through the Hausman test which was used to assess the effect of time. Derived Hausman test static for each model specification was large, with significant p-values, thus, the null hypothesis is rejected, in all estimations, the fixed effect model is adjudged to be suitable for estimation.

In addition, the model was modified with the lagged dependent variable included to wipe out the unobserved firm specific effect by estimating the first difference of the revenue equation thus generating the dynamic revenue equation. The lagged dependent variables introduce endogeneity Problem (Fosu, 2013) as, by construction, they are correlated with the differentiated error terms.
To control for such endogeneity bias, the study followed Goddard and Wilson (2009) in the use of the difference GMM estimator by Arellano & Bond (1991), in which lagged levels of the endogenous variables are used as instruments in the differenced equation.

 In the context of panel data, there is the need to deal with unobserved heterogeneity by applying the within (demeaning) transformation, as in one-way fixed effects models, or by taking first differences if the second dimension of the panel is a proper time series. The ability of first differencing to remove unobserved heterogeneity also underlies the family of estimators that have been developed for dynamic panel data (DPD) models. In analyzing banking industry profitability, to ascertain the effect of determinants of banking profitability,

the study adopted a one-way error component regression model. A fixed cross-sectional effect was adopted above so as to capture unobserved idiosyncratic effects of different banks with the constant variable treated as section-specific. The fixed effects estimator (LSDV) is the least-squares dummy variables which allows for different constants for each group as it includes a dummy variable for each group as outlined in (Cooper and Schindler , 2010).

The Arellano–Bond approach, and its extension to the 'System GMM' context, is an estimator designed for situations with: (1)'small T, large N' panels: few time periods and many individual units (2) a linear functional relationship; (3) one left-hand variable that is dynamic, depending on its own past realisations; (4) right-hand variables that are not strictly exogenous: correlated with past and possibly current realisations of the error; (5) fixed individual effects, implying unobserved heterogeneity and (6) heteroskedasticity and autocorrelation within individual units' errors, but not across them.

DATA AND DATA SOURCES

To analyse bank consolidation and profitability of commercial banks in Nigeria, the study focused on yearly data from 18 banks in Nigeria. Information and data are collected from the annual report and accounts of these banks as audited by respective bank' auditors. Independent data were obtained through the Central Bank of Nigeria statistical unit. Macro data are obtained from both the Central bank and also Bureau of statistics in Nigeria. Data period covers 2005-2014.   Due to fundamental changes that have occurred in Nigerian Banking landscape since 2004, which resulted in hurried re-alignment and un-envisaged M&A in response to the consolidation deadline of December 2005 coupled with subsequent banking reform in year 2009 (culminating in further reduction in number of deposit money banks (DMBs);   some banks had missing data in some years. To ensure our results are devoid of bias banks, all acquired banks were omitted in our analysis. Therefore, the periods under analysis covers the actual consolidation era (2005 – 2009) and 2009-2014. These represent the periods of actual consolidation and period post the 2009 banking reform till end of that governance regime. This allows for a comprehensive evaluation of impact of reform measures undertaken by the central bank governors in charge at these independent periods.

Table 2: Descriptive Statistics

	CAP	LIQ	CR	INT	INVGDP	INDCONC	NIM
Mean	0.099261	23.51710	0.093724	10.35000	0.002081	5.214698	11.02621
Median	0.045304	0.306096	0.052908	11.00000	0.002151	5.298317	11.22754
Maximum	1.180547	648.4289	1.031264	13.00000	0.003041	6.418365	12.85709
Minimum	0.008384	0.023252	0.010070	6.000000	0.001128	1.098612	5.021265
Std. Dev.	0.151004	91.82196	0.123618	2.440810	0.000635	0.908314	1.104406
Skewness	4.040572	4.479831	4.164744	-0.704943	-0.090519	-1.395604	-1.515391
Kurtosis	24.18059	24.19421	27.01051	2.178426	1.746572	7.210645	8.111397
Jarque-Bera	2997.879	3088.574	3767.662	15.53278	9.355830	148.8689	205.9868
Probability	0.000000	0.000000	0.000000	0.000424	0.009298	0.000000	0.000000
Sum	13.89649	3292.394	13.12133	1449.000	0.291292	730.0577	1543.669
Sum Sq. Dev.	3.169518	1171947.	2.124112	828.1000	5.60E-05	114.6797	169.5402
Observations	140	140	140	140	140	140	140

Table 2 shows that the data series being analysed follow expectation with no apparent deviations. The data exhibit a high goodness of fit as reported mean and median are well within the range of the data, high Jarque-Bera statistics, Kurtosis in excess of 3, thus indicating goodness of fit. However, as can be seen from Table 2, there is a clear difference among banks

in terms of their liquidity position and ease of adjustment to changes in macro-economic indicators especially the impact of interest rate adjustments on their financial position. This is also clear when we look at the Kurtosis relating to the macro variables - interest Rate (INT) and Investment (INVGDP). Consequently, controlling for macro, industry and bank-specific characteristics is of great importance in understanding the determinants of bank performance.

DISCUSSION OF RESULTS

The results of regressions in models 1 and 2 below relates to a panel two-stage estimation comprising pooled least square estimates in model 1 and the dynamic one –step GMM estimates in model 2. Variables used are common to both estimations comprising bank specific, industry specific and the two market control variables – (INT, INVGDP). The adj-R2-squared statistic of 0.5249 for model 1 shows the model's goodness of fit and the ability of the variables to explain the dynamics of Net Interest Margin in relation to the risk profile and other inherent characteristics of banks in the country. GMM estimation in model 2 is to done to allow us adjust for problems associated with Pooled OLS estimation.

Table 2: Determinants of Banks' Profitability:

	Dependent Variable: Ln NIM			
	Pooled OLS		Dynamic GMM	
	[1]		[2]	
Variables	coefficient	Probability	Coefficient	Probability
L.NIM	-	-	0.395434	0.0000
Ln (CAP)	0.267147	0.0249**	2.285015	0.0480**
Ln (LIQ)	0.000134	0.0875*	0.001258	0.0910*
Ln (CR)	0.011780	0.8549	-0.51297	0.9330
Ln (INDCON)	0.066461	0.0000**	0.497847	0.0000**
INT	-0.011420	0.01808*	-0.870088	0.0710*
INVGDP	-0.135625	0.0001*	-0.218301	0.0003**
Constant	1.301239		6.003991	
Number of Observation	140		126	
Adj-R²	0.524908		-	
F-Statistic	12.70585		–	
S.D Dependent VAr	0.967970		-	
Durbin-Watson Stat	1.054252		-	
Schwarz criterion	2.442768		-	
Prob>F	0.000000		-	
Sargan /Hansen (p-values)	-		34.00(0.5160)	
1st order ser. Cor.(p-values)	-		-1.99(0.046)	
2nd order ser. Cor.(p-values)	-		-0.56(0.577)	

* Significantly different from zero at the 10% significance level.
** Significantly different from zero at the 5% significance level.

The result above shows the importance and a direct application of elements of CAMEL[2] assessment in Banking; of bank level characteristics review, Capital adequacy (CAP) and Liquidity (LR) significantly affected banks profitability over the reform period. Industrial concentration (INDCON) also significantly affects the bank profitability at 5% level of significance. Credit Risk (CR) however did not affect bank's profitability in both estimations over the reform period.

CAP (proxy for consolidation), the measure of the adequacy of capital and capital has a positive and significant impact on banks returns following reforms in both models estimated in Table 2.. This is not unexpected as banks with high capital are able to assume higher level of risk and as a consequence obtain higher profitability. Higher profitability will result from lower cost of deposit insurance payment, as well capitalized banks will have reduced cost of funding but are able to also lend at higher rates thus maintaining a wide transaction spread3. The ability to reduce cost of funding and maintain or even increase lending rate will ensure the bank profitability (Demirguc-Kunt and Huizinga, 1999).

In terms of Liquidity Risk, LIQ follows expected outcome and the level of a bank's liquidity is shown to be a major factor impacting interest revenue. This is plausible. Banks with higher level of liquidity are able to maximize funds deployment between direct lending to customers or utilizing liquidity for investment in government backed security. Given the history of default culminating in significant non-performing loans in periods coinciding with reforms (Years: 2005 and 2009), banks in Nigeria have moved away from long term structured lending to short dated lending. In turns banks have invested heavily in Nigerian treasury bills of up to 1-year tenor with highly attractive yields and no risk. Prevailing high interest rate regime have also benefited banks significantly. Hence the positive correlation between liquidity and interest margins. In the same manner, high liquidity also implies that banks can grow quality risk assets by deploying funds to 'safe' sector. High bid-ask spread implies significant returns from loan creation. Conversely a lower leverage ratio would imply a lower insolvency risk. Financial reform, however, led to the development of new banking products and alternative sources of funds for banks, which would signal a strategic role for bank capital in cases of liquidity shortages (see Diamond and Rajan, 2001).

The impact of Credit (CR also called default Risk) on bank profitability is mixed and varies in both our models. Pooled OLS regression in Model 1 indicates a positive relationship. Positive coefficient of Credit risk is a pointer to a bad management and affirms the Skimping hypotheses of Berger and DeYoung (1997a,b). Berger & DeYoung (1997) introduced the efficiency-risk hypotheses which dwelt on the Bad management framework and Skimping. Loan skimping explains a scenario in which in order to be more efficient a bank reduces expenses devoted to credit screening in loan origination in the short run. Reduced screening cost will improve efficiency in the short run but at the same time, lead to increased adverse selection of borrowers which will result in increased loan default thus resulting in increased

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[2] The CAMELS rating system is a recognized international rating system that bank supervisory authorities use in order to rate financial institutions according to six factors represented by the acronym "CAMELS." A rating of one is considered the best and the rating of five is considered the worst for each factor. The components of a bank's condition that are assessed are Capital adequacy, Assets quality, Management Capability, Earnings and Liquidity. In 1995 the Federal Reserve and the OCC replaced CAMEL with CAMELS, adding the "S" which stands for Sensitivity to Market Risk.

[3] The transaction spread in Nigeria is indeed wide with average interest rate of 3.0% p.a on current account balances versus minimum 14% as indicated by the monetary policy rate (MPR) Banks would normally lend at higher than the MPR to ensure premium over the CBN rediscount rate which represents profit. High transaction spread remains a major attraction for investors in Banking.

non-performing loans and adverse credit quality consequences in the long run. Although not expected, the negative impact of credit risk on bank margin in model 2 is understandable for Nigerian banking industry as the quality of the credit can be confirmed from reported level of non-performing loans (NPL) during the considered period. Prior to consolidation, the quality of loans granted by the industry were suspect as most banks did not subject loan approval process to strict risk management framework, hence prevalence of high level of non-performing credits.

Post consolidation, with availability of tier 1 capital to banks, there was aggressive expansion of the loan books thus generating another round of systemic stress which led to the 2009 intervention in 10 banks. As at the date of intervention in 2009, industry's ratio of non-performing loans to total loans had jumped from 6.3% in 2008 to 32.8% in 2009, with improvements to 15.5% in 2010. With strong risk framework drafted for the industry, post 2009, industry non-performing loan to total loans has settled at 3.3% by end of 2014. Continuing periodic spike in NPL levels shows that though the Nigerian banks have been able to increase their capacity to manage credit risks, this needs to be sustained over a measurable period of time to change the profile of loan intensity for the industry. Recent volatility in oil prices have led to a reversal of previous credit management initiative. As Nigerian fell into recession in year 2016, the industry witnessed significant credit deterioration with Industry NPL ratio at above 13% in Q1 2018. Acceptable regulatory benchmark is 5% per bank. However, similar to Brisssimis et al. (2008), credit risk (CR) is not a significant determinant of NIM in both models in Table 2. This may be due to the impact of other revenue sources on banks' profitability level and inability of net interest margin to capture the increasing importance of fee generating activities.

The level of competitiveness of the Nigerian banking is found to be strong when competitiveness is measured in terms of each operator's market power, proxied as Industry Concentration (a measure of market operator in terms of total industry.

INDCON measured in terms of network coverage (Number of Bank Branches/Total industry bank branches) is positive and significantly correlated to banks' net income levels in both models. This result is not strange as the impact of network (branch coverage) on banks profitability levels is always positive, supporting the earlier findings of Randhawa and Lim (2005). A major reason would be the ability of commercial banks with wide branch coverage to mobilise cheap deposit and low interest current account deposits. Commercial banks then on-lend these cheap deposits to the real sector at monetary policy rate plus significant spreads across geographies and demographics, with resultant high profits. On the other hand, banks with limited number of branches may have to resort to more expensive inter-bank market to source funds thus creating disparity in banks funds structure. A positive coefficient of INDCON thus affirms the structure-conduct-performance (SCP) hypothesis when NIM is used as the dependent variable for Nigerian banking. Presence of SCP hypothesis implies that the size and structure of some banks (especially the biggest 5 banks which commands over 50% of total industry asset and Branches) confers some advantages. From the results, these are able to engage in non-competitive behavior despite the presence of monopolistic competition in the Nigerian banking space. Non-rejection of the SCP hypothesis indicates that in a concentrated market, banks with large market share can secure better profits by adopting oligopolistic behavior. Perhaps, correlation between corporate profit and market concentration can be explained by the fact that firms with superior management, cost reduction technologies, and efficient production and operation may reap substantial profits and expand their market share. This explains why in the analysis of market structure, the non-structural approach measures

market competition in the context of corporate behaviour rather than measuring the degree of concentration. Indeed, Nigerian banking is concentrated with the top 5 banks accounting for more than half (52%) market share of the total banking industry in year 2014. However, Nigerian banking market is highly regulated and competitive. Banks are able to price their assets freely within permissible limit by regulators and customers able to move freely amongst banks in search for least cost banking services for expected service quality. The size of some banks would imply that they can muscle out competition on specific transactions as they can choose a cost leadership strategy.

The macroeconomic environment
Finally, as regards the effect of the macroeconomic control variables on bank performance, we find a negative and significant relationship between NIM and INT as well as between NIM and INVGDP.

The level of interest rate (INT) is one of the most significant variables in the explanation of the net interest margin given that banks principal function is financial intermediation. The ability of individual financial institutions to moderate interest cost and sources and cost profile of deposits and other financial instruments is what distinguishes an efficient bank from an effective one. From both our models in Table 2, Short term Interest (INT) rates exerts a negative but highly significant impact on interest margins. This is not unexpected of Nigerian banking, given that Nigerian bank's face homogenous monetary conditions, thus to boost margins banks offer other structured banking solutions covering trade, foreign exchange, payments and advisory services instead of remunerating deposits explicitly by paying an interest rate, which in turn leads higher interest margins. The effect of implicit interest payment on net interest margin after the consolidation period has been slightly reduced because of the changes in the revenue structure of bank services operating in the sample. This reflects the fact that an increase in the importance of explicit collection of banking commissions results in a smaller volume of implicit interest payment, which led to a decline of the interest margin. Moreover, a negative and significant effect of, short-term interest rate on revenue growth, is also in line with theoretical priors suggesting that lower interest rates raise investments in new technology (Brissimis et al. (2008).

Finally, our analysis of the impact of volatility of economic activity proxied by INVGDP follows Maudos and de Guevara, 20044; and Yildirim and Philippatos, 2007), reveals an adverse relationship between changes in macro-economic activities and banks interest margins. As widely known, markets do not favour uncertainties. Thus, an uncertain market will be deemed 'hostile' to investment, which will lead to the exit to portfolio investment and reduction in FDI flows into an economy. Should this situation occur, aggregate demand will reduced resulting in Gross Domestic product contraction. Contraction in economic activity will lead to reduced monetary flows which will affect banks' ability to create credit and earn interest income. The Nigerian economy witnessed significant volatility in year 2016 on the back of oil induced recession. This culminated in reduced FDI and portfolio investment flows into the economy. The result is a complex web of activities which led to contraction in economic activity as evidenced by sustained reduction in GDP growth rates until we turned a corner in Q4 2017 with positive GDP growth.

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[4] The results show that the fall of margins in the European banking system is compatible with a relaxation of the competitive conditions (increase in market power and concentration), as this effect has been counteracted by a reduction of interest rate risk, credit risk, and operating costs.

CONCLUSION AND RECOMMENDATIONS

This study examines the relationship between banking reforms, industry competitiveness and banks risk architecture on banks profitability in Nigeria. In analysing the impact of reforms on banking profitability, the study adopted a financial intermediation approach using bank-level data from 2005-2014. This paper follows existing literature in the EU that studied the relationship between financial reforms, banking industry competition, risk-taking behaviour of banks, and growth in banks profitability levels since beginning of various reform initiatives. Empirical evidence since 2005 banking reform indicate that, on average, that banks efficiency and product offerings have improved significantly while the competitive conditions in the Nigerian banking systems have also improved and have become broad but with a few banks still controlling over 5% of total asset of the industry.

Consequently. We model available bank level data to analyze the inter-relationship between banking sector reform and performance. By drawing on recent literature presented by Brissimis et al. (2008); we are able to show that banking sector reform has a positive effect on industry profitability, with the channels of transmissions being via level of capitalization, liquidity and network effectiveness modelled by level of concentration prevalent. This affirms the structure-conduct-performance (SCP) hypothesis when NIM is used as the dependent variable for Nigerian banking. Presence of SCP hypothesis implies that the size and structure of some banks confers some advantages in terms of pricing and product leadership. In addition, the impact of capital and liquidity risk is prominent while non-prominence of credit risk in our estimation shows that developments since beginning of reforms already affected credit risk exposure and tolerance threshold. Hence impact of credit risk is muted in this study. Finally volatility of macro-economic policies and activities impacts negatively on bank's margin as it affects industry perception and attractiveness of the economy to potential investors. Policy initiatives that signals continuing and sustained government focus on maintain macro-economic stability will contribute to growth of banking and as a consequence the real economy.

The study proves that reforms have improved the profitability of the banking industry in Nigeria. Improved profitability has manifested in significant growth witnessed in the introduction of technology driven banking services and increased spread of banking patronage resulting in wide embrace of e-banking platforms by Nigerian Citizens. Results from this study provide evidence that the profitability of post-consolidation banking system in Nigeria was derived from banks' internal management' decisions as well as industrial structure prevalent at the time. From the regulator's perspective, this means that there is need for an effective regulation covering risk management framework and architecture which adequately moderate banks management and ownership decisions and industrial structure is highly essential in achieving sound banking performance and competition in Nigeria.

Lastly, the use of the dynamic GMM method of estimation used in analyzing profitability of banks in the model also proves that that the banking landscape in Nigeria is dynamic with orderly transmission process in adjusting to various shocks to the system. Ultimately, all banks would adjust to changes in the medium to long term.

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