Financial Reforms, Structure and Competiveness of Nigerian Banking Industry

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Abstract

Nigerian banking industry witnessed series of financial reforms since 1986 and most recent was the bank consolidation and reforms of 2004. The reform aimed at widening and deepening the market as well as enhancing its competitiveness and efficiency. While the policy might have led to some significant changes in term of size and coverage, there are still serious debate about the extent to which the policy has enhanced competitiveness and financial intermediation. This paper investigates the extent to which these financial reforms have impacted on degree of competitiveness and concentration in the Nigerian banking industry since 2001. This paper specifically measures and compares the degree of banking competitiveness in two sub periods, 2001–2004 and 2005–2013, in order to investigate the implication of 2004 bank consolidation on the competiveness and the market structure of banking industry in Nigeria. A unique contribution of this study over any other studies on Nigerian banking industry is the use of a detailed bank-level panel data set, and measuring competition using the PR-H-statistic and the time varying Lerner index. The estimation of Lerner index provides the first ever documented empirical evidence on the evolution of competitiveness in the Nigerian industry. The empirical results show that the estimated H-statistic is 0.46 and it is statistically significant at 1% level. The null hypothesis of both monopoly and perfect competition are therefore rejected. The intuition of the empirical analysis result of the study over the sample period is that Nigerian Banks earned their revenue under conditions of monopolistic competition. Intuitively, the empirical results suggest that the factor prices are important for the Nigerian banks in the pricing of bank products and services. From the result, Wages/Salary and price of capital contribute the most to the value of H- statistic. The Lerner index also provides an alternative to the popular PR-H index for determining bank competitiveness and market power. The Lerner index was estimated to be (0.77) which gives further evidence on market power and the degree of competitiveness of banks in Nigeria All tests and diagnostic statistics also lend credence to the goodness of fit and the robustness of the model. The findings lend support to previous research findings, particularly in developing countries that financial reforms and bank innovativeness have direct implication on both bank competiveness and market structure.

1.0 Introduction

The Nigerian banking industry underwent significant restructuring between 2000 and 2014 when over 100 banks as at 2000 were contrived to 25 banks in 2005 and to less than 18 banks by 2014. Prior to this period, many of these banks had less than N2billion as their capital base. Through a Central Bank directive the bank were mandated to recapitalise to a minimum of N25billion by 2005. Those banks that could not raise such funds were encouraged to merge or be acquired by other bigger banks. Definitely, the reduction in the number and increase in the capital base would have altered the structure and competiveness of the banking industry in Nigeria. A competitive banking sector is important for the proper functioning of the economy. Indeed, the banking sector is the cornerstone of any properly functioning modern economy hence changing in its structure should be utmost important to both scholars and policy analysts. . Studies on competition in banking markets though has been at the centre of research since 1980s,, yet studies from Africa and other emerging markets are sparse and significant pedestrian in scope and depth. Without doubt, studying competition in banking industry particularly for developing country like Nigeria where reforms have been undertaken over the past decades is undoubtedly crucial hence the need to examine the experiences countries in Africa that have undertaken financial reforms in term of how such reforms have altered the structure and competiveness of the banking industry in such counties

A unique contribution of this study over any other studies on Nigerian banking industry is the use of a detailed bank-level panel data set, and measuring competition using the PR-H-statistic and the time varying Lerner index. The estimation of Lerner index provides the first ever documented empirical evidence on the evolution of competition in the Nigerian industry. In addition to evaluate the consolidation effects on competitive conduct of banks operating in Nigeria, H-statistic across two periods (pre-consolidation and post-consolidation) and the time varying Lerner indices are estimated and compared. This analysis provides a unique opportunity to reconcile the dilemma of inconsistencies between expectations of policy reforms and observed evidence on the conduct of Nigerian banks and identify those factors that can under a successful competition law and regulatory framework to strengthening competiveness of Nigerian baking industry..

.Apart from the introduction section the paper will be divided into five sections. Section 2 provided some stylized fact about Nigerian banking industry while section 3 reviews some related studies and provides the conceptual underpinning of the study. Section 4 discusses the methodology and section 5 presents the empirical results while section 6 summarizes with policy implications

2.0 Financial Sector Reforms and Bank Competitiveness in Nigeria

After more than two decades of financial repression, financial liberalisation offered an opportunity for a revival of the Nigerian banking industry. As part of the broader economic reform package, financial reforms were in recognition that a well-functioning and competitive financial system is critical to the country's overall economic development. By 2005, the Central Bank of Nigeria embarked on Banking Consolidation exercise, a widespread strategy aimed at strengthening financial sector infrastructure to enable it support sustainable economic growth. The implementation of the consolidation has helped address key bottlenecks in the financial system, including improving corporate governance of the banking sector, after the crisis of the pre 2004.

In 2008, the existing 25 banks were further pruned down to 17 through a rescue exercise by the central bank of Nigeria. Out of these, seven were first generation banks and others were new generation banks. Majority of these banks were instructed to divest from non banking activities and this led to the provision of a unique feature of ownership, encompassing foreign financial equity stake, domestic private sector participation and public sector interest. Nonetheless, management rights reside with Nigerians. However, the Nigerian banking industry continues to exhibit a high level of concentration as very few banks dominate the financial landscape. In terms of assets and deposits, five largest banks accounted for sixty six percent between 2004 and 2013. The other banks captured the remaining one third.

As per profitability, the two traditional profitability measures of ROA and ROC employed. However, these measures alone are no longer adequate to measure banks profitability performance as they do not adequately meet the needs of stakeholders. Nigerian banks have been vibrant, generated from earnings on loans, bonds and treasury bills. The increase in the number of new entrants in the late 1990s lent credence to this view. The profitability level of most banks however nosedived between 1998 and 2011 due to a number of factors including, inadequate risk management capacity, ethical issues and poor corporate governance. ROA averaged about 6% for this period, the regulatory authority had to intervene to acquire the non performing loans of these banks by 2009. At the same time, this performance led to acquisition of five distressed banks, at a time the whole industry also experienced a squeeze in earnings due to the global financial crisis.

To reinforce the Nigerian economy, the central bank of Nigeria announced a new 13-point reform agenda in mid 2004. Overall, the goal of this agenda is to promote soundness, stability and enhance international efficiency of the Nigerian banking industry. The highpoint of this reform is that all banks in the country should raise their minimum capital base to N25 billion, with a compliance deadline of 18 months. The efforts of banks to comply with this directive triggered merger and acquisitions. This also led to the increase of the share of the industry in the Nigeria Stock capitalization from 24% to 38% between 2004 and 2006. At this end of this deadline, 25 banks made it through out of which nine were first generation banks. (CBN, 2008).In spite of these positive developments, a new set of challenges merged in 2008 and threatened the financial system, coinciding with the global financial crisis.
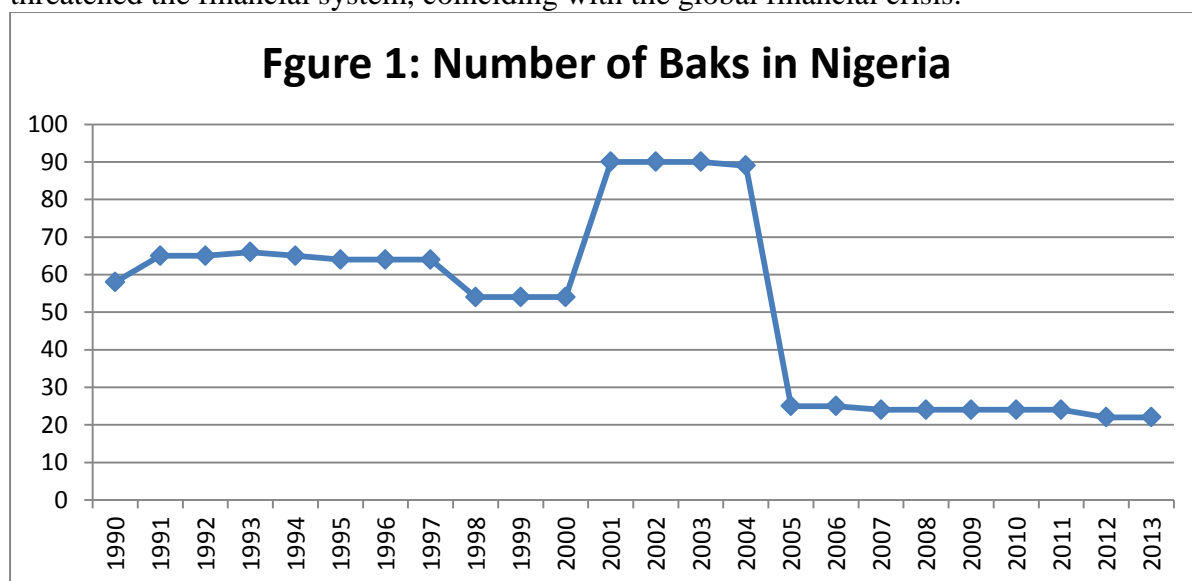

Fgure 1: Number of Baks in Nigeria

Table 2: State of the banking industry (2001-2010)

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sound	10	13	11	10	25	10	Na	Na	13	15
Satisfactory	63	54	53	51	0	5	Na	Na		Nil
Marginal	8	13	14	16	0	5	Na	Na	1	6
Unsound	9	10	9	10	0	5	Na	Na	10	3

3.: Review of Selected Literature
The issue of bank competition and market power has dominated literature in financial economics in the last two decades. The resurgence of interest on the structure and market power of firm in the banking sector arose from the realisation that the financial reform undertaken by many developing countries deepened the monopolistic tendency that were hitherto prevalent when the market was repressed and regulated.

The H-statistic proposed by Panzar and Rose (1987) and Lerner index (Lerner, 1934) have been the most frequently used measures of competition and market power especially banking competition and measures of market power in an industry. The H-statistic, the sum of revenue elasticities with respect to input prices, measures the level at which a change in factor input prices returned in the banks' equilibrium revenue. According to Panzar and Rose (1987), market structure is determined by the magnitude and sign of the H-statistic. The table below summarises the interpretation of H-statistic. Analysis of the H-statistic was predominantly for the developed economies. Earlier studies include Bikker and Haaf (2002) who concluded that monopolistic competition was the dominant market structure for the banking sector in majority of these economies in Europe. Similar study by Gelos and Roldos, 2004) for a group of same European and Latin American countries confirmed such monopolistic tendency among the European banks
.
However in Africa, the evidence of measuring the market power and the structure f the banking industry in Africa is limited and insufficient. One major constraint identified has been lack of data as most banks in Africa jealously guided sensitive data about their operation and when available in most cases are distorted. The implementation of disclosure laws by regulatory author and increased publication of some these data by regulatory authority has made most of these data publicly available in these economies and the need to evaluate banks performance in the face of reforms is becoming more crucial. In Ghana, Buchs and Mathisen (2005) find that financial reforms did not adequately foster banking competition while the result of Peiris in Uganda (2008) contrasts this evidence. Chen (2009) provides evidence using a more comprehensive sample from sub Saharan Africa.

The Lerner index as another measure of bank market power represents a mark-up of price over marginal cost (Lerner, 1934) and thus measures the banks exercise of market power. According to Cocorese (2009), Lerner index is a true reflection of banks level of market power because it represents the behavioural departure from monopoly and perfect competition. The index also recognises the need to endogenize market structure in testing the exercise of market power (Varlagas, 2008). Aboagye et al (2008) observe that Ghanaian banks possess market power mainly on account of their size, efficiency and the prevailing macroeconomic environment which they operate. Angelini and Cetorelli (2003) analysed the behaviour of Italian banks and discovered that deregulation of the sector foster a reduction in price-cost margins. Studies have also shown that whenever banks are faced with a constant elasticity of demand for their products and assuming there is no error of measurement in the

variables, there is a symmetrical relationship between the H-statistic and the Lerner index (Shaffer, 1983; Bikker and Haaf, 2002). As banks become more competitive (higher H-statistic), the narrower the relative price-cost mark-up (smaller Lerner index). A number of recent studies apply both approaches in measuring banking competition to serve as a check for the other. In general, the two approaches provide reasonable explanations of banking competitive performance in any economy (Cetorelli 1999).

Casu and Girardone (2003), investigated factors influencing the degree of competition in the banking sector of the single European market. The result suggests that, the degree of concentration did not necessarily relate to the degree of competition. The relationship between the two is not uni-directional as increased competition has forced banks to become more efficient but increased efficiency is not resulting in more competition in the EU banking system. Similar concerns were expressed by Habte (2012), when he explores competitive conditions of banking system of Sweden using the same method; the result suggests that, banks in Sweden generate their revenues under a monopolistically competitive environment. The boone indicator however suggests that, there was a slight drop in the degree of completion after the recent global crisis.

However, applying the Lerner approach to China, Bing and Michael (2013), observed that Lerner index failed to measure competition in the Chinese banking industry due to the regulation of interest. Simpasa (2013) argued that profit elasticity approach of Boone (2008) does not suffer from these shortcomings. Adopting the same model, Stavarek and Repkova (2011), analysed competitive nature of Czeck banks over a decade. The result indicated that, dound conditions for competition were present in the banking industry of Czeck. While the market can be described as perfectly competitive, the degree of competitiveness declined after joining the EU in 2004 and the market can now be described as one of monopolistic competition.

Sunil and Binsheng (2008), investigated the impact of financial sector reforms on the competitiveness of banks in Egypt. The study showed that while that the state owned banks are generally less competitive, when compared with their privately owned counterparts. The average x-efficciency of Egyptian banks is around 30% which is comparable to those reported for other African countries. Mohammad (2013),presented a comparative analysis of the banking sector in Iran using two different empirical Industrial Organisation (NEIO) approaches (Panzar-Rosse and Hall Roeger Models. The result of the calculated H-statistic shows that, the Iranian banking sector's has a monopolistic structure. The results showed that, the degree of competitiveness in Hall-Roeger model seems to be intensive than other model, indicating that, the Iranian banking industry is non-competitive. Similarly, Sami (2009) and Bikker et al. (2012), analysed the degree of competitiveness of banks in Tunisia using Panzar-Rosse Model. The result of the study reports the H-statistic to be 0.89, indicating that Tunisian banks operate in neither a joint monopoly nor a collusive competition context, and that they evolve within an oligopolistic competition context in a contestable market. Thus, it confirms the presence of a competitive environment.

Hakam et al (2013), Fosu (2013), empirically showed that, there is a positive relationship between the index of competition and concentration thereby verifying our theoretical perception. Their results are consistent with those of other emerging economies, results suggest African banks generally, demonstrate monopolistic competitive behaviour. Although the result further indicate that, the Panzar-Rosse H-statistic is downward biased compared to

the dynamic version. The competitive characteristics identified are however robust to alternative estimators. Kot (2004), unlike earlier studies differ by employing both the Panzar-Rosse and Bresnahan models respectively to analyse the implication of competition on the South Africa banking sector. The result of the study suggests is consistent with monopolistic competition. There seems to be high concentration and the banks are not acting aas a cartel. Generally speaking, the two approaches offer reasonable explanations of banking competitive performance in any economy and reinforce the perceptive that competition and monopoly are neither plausible practical outcomes of market conduct in the banking industry , (Cetorelli, 1999). Simpasa (2013) evaluated the degree of competition in the Zambian banking sector in the wake of dynamic market shifts induced by entry of new foreign banks and privatisation of the state-owned bank. Using both PR-H index and a time varying Lerner index showed that Zambian banks earned their revenue under conditions of monopolistic competition and argued further that competitive conditions could be further enhanced by easing regulatory impediments and in the long-run, allowing more foreign bank participation could spur competitive conduct in the industry.

The evidence of banking structure and market power is sparse, indeed to stimulate interest in this area the Central bank of Nigeria has to initiate a comprehensive study on the issue. CBN (2013) argued that while the trend of bank profits in Nigeria since the liberalization of the financial sector and the increased number of new entrants to the industry had led to the thinking in many circles that investment was most worthwhile in the banking industry, the bank noted that there are no available statistics either for inter-temporal or group comparisons within the banking industry and much more so for comparison between returns on investment in the banking and the other industries. The paper argued that existing studies that assess the performance of the Nigerian banking industry either had the mark of incomplete coverage or were limited in scope in terms of the number of metrics used. Different from past studies which employed majorly aggregate data, CBN (2013) adopts bank level data for assessment of not just bank performance but also intermediation, growth and competition in the banking sector. The results of the study indicated that though the Herfindahl-Hirschman Index (HHI), a metric for measuring competition, with respect to assets and deposits increased after the bank consolidation exercise, the industry remained largely competitive, as concentration declined slightly. With respect to size and performance, the mixed results from the analysis across the different policy periods and sizes, indicated that bigger is not necessarily better, in terms of profitability, cost and managerial efficiency as well as productivity. The paper argued that the result notwithstanding, except similar studies are done the outcome of this study may not be sufficient to safely and conveniently conclude that the banking industry is more competitive enough to attract for investments than other segments of the economy.

One of the major motivations for this paper is to determining the nature and degree of market structure of Nigeria banks. While the CBN (2013) paper remained the most comprehensive study on the post consolidation appraisal of banking industry, the caution expressed its result shows that the issue is subject to empirical debate. More so this paper attempt to use PR-H model and also to estimate the time varying Lerner index which has not been used extensively in studies on Nigeria economy.

4 .0 Methodology
The primary interest of this study is to analyse the nature of competition in the Nigerian banking industry from the perspective of broader macroeconomic setting. This paper adopts

both the Panzar-Rosse and Lerner index methods. Both approaches have sound theoretical foundations and empirical appeal and had been applied to banking data from other countries like Ghana, Egypt Morocco and Zambia. The analysis enables us to compare our results with those obtained from previous studies, especially those African countries with similar banking reform experiences.

The PR methodology allows for bank specific differences in the reduced form revenue function and acknowledge of bank output and prices is not required. Following Simpasa (2013) the empirical PR model is specified as
:

$$In(Nrev_{it}) = \beta_0 + \beta_1 In(PC_{it}) + \beta_2 In(PF_{it}) + \beta_3 In(PL_{it}) + \beta_4 In(CRISK_{it}) + \beta_5 In(CAPR_{it}) + \beta_6 In(OI_{it}) + \beta_7 In(INF_{it}) + \beta_8 In(TBR_{it}) + +e_{it} \ldots \ldots (1)$$

Where subscripts i and t denote bank i at time t and $nrev_{it}$ is bank Net Income, scaled by total assets to control for scale effect; PC, PL_{it}, PF are price of capital, approximated by expenses on salaries and other staff compensation, divided by total asset; unit price of fund (interest expenses divided by total purchased fund); unit price of capital (all other expenses divided by fixed and other assets). While OI_{it}, $RISK_{it}$, $INFLt$, and $TBRR_{it}$ denote, respectively, operational inefficiency, Credit Risk, Capital to risk Ratio, Inflation Rate, Treasury Bills Rate. Explanatory variable are given by bank specific factor and indicators of macroeconomics condition to capture the environment under which banks operate. RISK is the ratio of nonperforming loan to gross loan; CAPR is the ratio of capital-to-risk weighted assets capturing regulatory burden. To capture macroeconomic condition, we include volatility in the rate or inflation (INFL) to control for macroeconomic uncertainty while the 91-day Treasury bill rate (TBR) is included to capture stance of monetary policy on the bank behaviour(Sanya and Gaether 2012).

From Equation (2), $H=\beta_1 + \beta_2 + \beta_3$, the sum of the revenue elasticities with respect to input factor prices.

Table 3: Interpretation of the Panzar Rose H-statistic

H-statistic Hypothesis	Market Structure Features
H ≤0	Monopoly or conjectural variations short term oligopoly. In this case each bank operates independently as under monopoly profit maximising conditions and the H-statistic is a decreasing function of the perceived demand elasticity.
0 < H < 1	Monopolistic competition characterised by free entry equilibrium excess capacity. The H-statistic is an increasing function of perceived demand elasticity.
H = 1	Perfect competition, or natural monopoly in a perfect contestable market or sales maximising firm subject to break even constant. It could imply free entry equilibrium with full capacity utilization.

Source: Simpasa (2013).

4.1 Empirical model of the Lerner index

The empirical strategy for estimating the Lerner index is adapted from Fernandez de Guevara and Maudos (2007) and Aboagye, et al. (2008) as applied it to Ghanaian banks. Thus, in line with these studies, we estimate a generalised a translog cost function given by the equation below:

$$In(TC_{it}) = \alpha_0 + \alpha_1 In(INC_{it}) + 1/2\alpha_2 In(INC_{it})^2 + \alpha_3 In(PC_{it}) + \alpha_4 In(PF_{it}) +$$
$$\alpha_5 In(PL_{it}) + \alpha_6 In(PC_{it})^2 + \alpha_7 In(PF_{it})^2 + \alpha_8 In(PL_{it})^2 + \alpha_9 In(PC_{it})In(PF_{it}) +$$
$$\alpha_{10} In(PC_{it})In(PL_{it}) + \alpha_{11} In(PL_{it})In(PF_{it}) + \alpha_{12} In(INC_{it})In(PC_{it}) +$$
$$\alpha_{13} In(INC_{it})In(PF_{it}) + \alpha_{14} In(INC_{it})In(PL_{it}) + \alpha_{15} In(RISK_{it}) + e_{it} \ldots \ldots (2)$$

If $(PF_{it}), (PF_{it})$ and (PL_{it}) is represented by (P_i) and $i = 1,2 \ldots \ldots j$ then equation 3 becomes

$$In(TC_{it}) = \alpha_0 + \alpha_1 In(INC_{it}) + 1/2\alpha_2 In(INC_{it})^2 + \sum_{i=1}^{j=3} \delta_{1i} In P_i + \sum_{i=1}^{j=3} \delta_{2i}(In P_{i_{it}})^2$$

$$+ \sum_{i=1}^{j=3} \delta_{3i}(In P_i In P_{i_{it}}) + \sum_{i=1}^{j=3} \delta_{4i}(INC_i In P_{i_{it}}) + \alpha_{15} In(RISK_{it}) + \epsilon_{it}, i$$
$$= 1 \ldots N \ t = 1 \ldots T \ldots \ldots \ldots .3$$

TC_{it} denotes total operating cost (interest expenses plus non-interest expenses), output measure by total assets (INC_{it}), input factor prices are as defined above while ϵ is a composite disturbance error term obeying all classical assumptions. Partially differentiating Equation (2 or 3) with respect to INC_{it} yield bank level marginal cost (MC_{it}):

$$MC_{it} = \frac{\partial In TC}{\partial In INC} = \frac{TC_{it}}{INC}\left(\alpha_1 + \alpha_2 In(INC_{it}) + \sum_{i=1}^{j=3} \delta_{4i} In P_i\right) \ldots \ldots \ldots \ldots \ldots 4$$

Bank level marginal cost (MC_{it}) and corresponding output price, measured as total income divided by total bank assets (OP_{iit}), are in turn used to calculate the bank-specific time varying Lerner index,

$$LI_{it} = \frac{OP_{it} - MC_{it}}{OP_{it}} \ldots \ldots \ldots \ldots \ldots .5$$

Averaging (MC_{it}) and (OP_{it}) across all banks yields the industry P_{it}, wide marginal cost (mc_{it}) and market price (P_t) which are used to generate the industry wide Lerner index, given by;

$$LI_t = \frac{OP_t - MC_t}{OP_t} \ldots \ldots \ldots \ldots \ldots \ldots .6$$

LI_t is a counterpart of the H-statistic but show evolution over time. Under perfect competition, $OP_t = MC_{tt}$, and hence $LI = 0$. A large deviation of prices from marginal cost depicts increasing monopolistic conduct with the Lerner index approaching unit. A $LI = 1$ signifies complete exercise of market power. Like the H-statistic, LI_{it} is bounded between 0 and 1 with intermediate values denoting monopolistic competition. However, Sampisa (2013) argued that it is not uncommon for Lerner index to take on negative values and Solis and

Maudo (2008), denotes it as 'super competition' and may occur when banks price below marginal cost such as the case of initial subsidization noted above .

To analysis the main determinants of market power of Nigeria banks, the estimates of the bank level Lerner index regress on bank-specific and environmental factors (regulatory and macroeconomic variables) in order to evaluate factors that drive market power in the Nigerian banking industry . Equation (4) specifies the relationship between the estimated bank level Lerner index and potential correlates.

$$LI_{it} = \vartheta_0 + \vartheta_1 InRISK_{it} + \vartheta_2 InCAR_{it} + \vartheta_3 OI_{it} + \vartheta_4 TBR_{it} + \vartheta_5 INEFF_{it} + v_t \ldots 7$$

The variables are as previously defined. In addition, we add a measure of intermediation inefficiency (INEFF) to capture the potential effect of market inefficiency on financial intermediation. Simpassa (2013 used Cost inefficiency scores generated from a stochastic cost frontier equation in line with Simpasa (2010). As Simpasa noted "Cost inefficiency in banking is often associated with high mark-ups because banks tend to mask their operating inefficiency through high spreads, the cost of which is borne in most cases by customers

4.3 Data Sources and Estimation Techniques
Annual time series data from 1998-2011 for 20 commercial banks in Nigeria are used to estimate the H □□statistic and *LI*. Two banks that began operation after 2010 are excluded from the analysis due to insufficient data points. Three competing panel (Pooled, Random and Fixed Effects) econometric approaches are usually adopted in estimating models of banking competition. However, out of the competing panel data methods, the choice is mainly between fixed and random effects models. Pooled effects approach has been found to be inadequate due potentially strong firm and temporary effects, which may arise from heterogeneity of banks (Arellano, 2003). The choice between random and fixed effects models is guided by the results of the Hausman specification test. The data are collected from the banks' balance sheet and profit/loss accounts and Fact NSE Factbook, a yearly publication of Nigeria stock exchange.

5.0 Empirical Results

The starting point of the analysis is the estimation of the panel model. Based on the estimates evidence on competitive conduct in the Nigerian banking sector is assessed by the estimate of the H − Statistics. The benchmark model is applied on a full sample period for all banks captured in the study. The Hausman specification tests for panel data ruled out the random effects model. Nonetheless, in assessing the robustness of the PR model under different panel data statistical methods, we present the results of the three models and we estimated the H-statistic for all the three and it was clear that the H-statistic for the Fixed Effect model is found to be higher and most significant by the Wald test conducted. Thus, for the Nigerian banking sector, the full sample H − statistic estimate may be sensitive to the choice of the panel estimation approach and therefore conscious effort must be made in model selection process. The results are presented in Table 4

Table 4.0: Panel estimation of PR Model

Independent variables	Pooled Effects	Random Effect	Fixed Effect
PC	0.115**	0.116**	0.527**
	(4.105)	(3.88)	(4.01)
PF	0.023**	0.023**	0.024**
	(3.213)	(3.36)	(3.20)
PL	-0.053**	-0.015	-0.041**
	(-2.044)	(-0.39)	(-3.45)
CRISK	-0.069**	-0.007**	-0.078**
	(-3.995)	(-4.79)	(-3.57)
CAPR	-0.059*	-0.028	-0.061
	(-1.949)	(-1.20)	(-1.75)
OI	-0.005	-0.011	-0.005
	(-0.760)	(-1.23)	(-0.65)
TBR	-0.067	-0.016	0.001
	(-0.257)	(-0.77)	(0.30)
INFL	-0.016	-0.054	-0.041**
	(-0.719)	(.0.88)	(-3.33
C	0.089	0.013	0.050
	(0.652)	(0.12)	(0.37)
Adjusted R-squared	0.163	0.133	0.209
F-statistic	6.458	5.069	3.179
	(0.000)	(0.00)	(0.000)
Wald Test: H-Statistics	**0.133**	**0.139**	**0.511**
Null: H=0 (p-value) Monopoly			
Null: H=1 (p-value) Perfect Competition			
(Hausman) Test		$X^2 = 4.2745$ (0.00333)	

*Significance Level : *p<0.10, **p<0.05, ***p<0.01*

The empirical analysis of the results show that the estimated H- statistic is 0.51 and it is statistically significant at 1% level. The null hypothesis of both monopoly and perfect competition are therefore rejected. The intuition of the empirical analysis result of the study over the sample period is that Nigerian Banks earned their revenue under conditions of monopolistic competition. Intuitively, the empirical results suggest that the factor prices are important for the Nigerian banks in the pricing of bank products and services. From the result, price of capital contribute the most to the value of H- statistic. The wages and salary was found to be drag of revenue generating capacity of the banks, The banking industry is the highest paying industry in Nigeria. And the bulk of this are paid to top management staff.

In addition, bank – specific variables especially credit Risk and OI variables are in line with the expected signs and are highly significant at 1% significant level. This means that credit risk has impeded the growth of the Nigerian Banks revenue performance vis- a- vis the negative relationship between Net income of the banks and the nature of the non – performing loans granted within the sample period and the ability to offer services to the market at competitive prices. The negative coefficient of CAPR suggests that a large capital buffer aimed at maintaining banks' solvency imposes opportunity costs on banks' revenue performance. For macroeconomic variables, the Treasury bill rate (TBR) has a sign that is contrary to apriori expectation and it is significant at 1% level. This means that the monetary policy employed within the sample period through open market operation has not perform to expectation. Macroeconomic instability, denoted by inflation volatility, appears to have a

dampening effect on the banks' revenue performance because the coefficient estimate of the empirical result is negative and significant.

`Following the methods discussed in equation 3 to 6, the Lerner index was derived. The starting point is estimation of bank total cost function and derivation of marginal cost. The estimates are presented in in table 4 as an appendix below. From the estimated the marginal cost is derived and the Lerner index is calculated based on the equation 5 and6 to be 0.77 .

6.0 Conclusion and Policy implications

This paper explored a crucial topic of competition and structure of banks in Nigeria. Using a unique and detailed banks level data set, the study broadens previous research by estimating the Panzar-Rosse H-statistic from a reduced net income regression for the full sample. Taking into consideration market dynamics and their effects on competitiveness the Lerner index which assesses evolution of banking competition over time and the factors driving I was also estimated. These competitiveness indices offer hand on perspective on the understanding of banking sector competition in Nigeria and the policy implication of it. The general conclusion from our analysis is that, over the period under consideration, Nigerian banks exhibited monopolistic competitive behaviour. Specifically, the H-statistic from estimate was found to be positive (0.511) and statistically different from zero and unit. The Lerner index also provides an alternative to the popular PR-H index for determining bank competitiveness and market power. The Lerner index estimate (0.77) gives further evidence on market power and the degree of competitiveness of banks in Nigeria.

As an initial attempt at exploring the competitive conduct of Nigerian banks and how it has evolved overtime, the study offers important policy insights for the Nigerian banking industry, particularly, the estimate of the Lerner index offers more insightful perspective to the analysis of competitive behaviour among banks in Nigeria than the more static H-statistic. In this regard, the study corroborates previous studies in other countries which note the importance of penetration as a key factor stimulating competition in the banking industry.

In the final analysis therefore, maintaining an open policy could play a crucial role in fostering competitiveness in the Nigerian banking industry, particularly in view of the recent regulatory reforms on capital requirement and sound risk management. In this regard, the study extends the frontier of knowledge in developing economies and particularly subs Saharan Africa where such evidence is currently limited. The study concluded that, competitive behaviour of banks in developing economies may not be necessarily different from those of their developed economies counterparts.

Reference

Aboagye et al (2008), "Explaining the market power of Ghanaian banks" South African Journal of Economics. 76, 569-585.

Angelini, P. N. Cetorelli (2003), "The effect of regulatory reforms on competition in the banking industry" Journal of Money, Credit and Banking. 35(5) 664-684.

Bikker, J. K. Haaf (2002), "competition, concentration and their relationship; an empirical analysis of the banking industry" Journal of Banking and Finance, 26, 2191-2214

Bing et al (2013)measuring bank competition in china: a comparison of new versus conventional approaches applied to loan market. BIS working paper No 422.

Bhoga et al (2012), "Competitiveness of Indian banks." International journal of business and management finance. Vol. 2 (3). 2012.

Boone, J. (2008), "A new way to measure competition" Economic Journal, 118, 1245-1261.

Buchs, T. and Mathisien, J., (2005). "Competition and efficiency in banking: behavioural evidence from Ghana. Working Paper WP/05/17.Washington DC. International Monetary Fund.

Casu and Girardone (2004), "Bank concentration, competition and efficiency in the single European market" Management science, 39. 1261-1264. UK.

Craigwell et al (2006), "competition in the commercial banking industry of Barbados" P: 206-224.

Cocorese (2009), "Banking concentration and retail interest rates" Journal of Banking and Finance, 26, 2155-2189.

Fosu (2013), "Banking competition in Africa: sub-regional comparative studies. Working paper: 12/13. University of Leicester, UK.

Gelos, R. and Roldos J. (2004), "consolidation and market structures in emerging market banking system" emerging market review. 5. 39-59.

Hakam et al (2013), "Determinants of banking competition in Morocco and evaluation of the structural reforms" Journal of economics and financial issues. Vol. 3 (No. 2). P: 447-465.

Kot (2004), "Testing for competition in the South African banking sector" The review of economics and statistics. No. 71. 291-299.

Lerner A.P. (1974), "The concept of monopoly and measurement of monopoly power" Review of economics. 157-175.

Lonca and Rajic (2012), "Concentration and competitiveness of the Serbia Banking Market" current situation and possible future changes under the influence of market consolidation. Review paper: Ekonomika Preduzeca 336.71

Musonda (2008), "Deregulation, Market power and competition" An empirical investigation of Zambian banking industry. Working paper centre for studies of African economies, Oxford University.

Mensi (2010), "Measurement of competitiveness degree in Tunisian deposit banks" an application of the Panzar-Rosse model. Scientific review, panoeconomicus. P: 189-207

Mohammad (2012), "Comparative approach of competitiveness of Iranian banking sector" Journal of applied economics and business. Vol. 1. Issue 3, P 32-41.

Panzar J.C., and Rosse J.N., (1987), "Testing for monopoly equilibrium" The Journal of Industrial Economics, 35. P: 443-465.

Park (2013), "Bank mergers and competition in Japan" Journal of Banking and Finance. Vol. 9 Issue 2. Article 1.

Simpasa (2013), "Competition and market structure in the Zambian banking sector" African Development Bank group. Working Paper. No. 168.

Shaffer (1983), "Non Structural measures of competition: toward a synthesis of alternatives. Economic letters. 12. 349-353.

Starvarek and Repkova (2011), "Estimation of the competitive conditions in the Czech banking sector. MPRA paper No. 30720.

Stucke (2013), "Is competition always good" Journal of antitrust enforcement. P: 162-197.

Ryszard (2012), "Determinants of competitiveness in local financial market" e-Finanse: Financial internet quarterly. Vol.8. issue 1. P:1-13.

Appendix

Table 4: Estimating the Bank Total cost Function

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LINC	-0.223	1.54	-0.34	0.824
LINCSQ	-0.203	0.07	-0.02	0.839
PL	1.258	2.33	2.93	0.210
PC	0.290	11.67	3.38	0.772
PF	2.540	11.55	29.35	0.012
PCPL	0.669	1.23	0.82	0.504
PLPF	-3.763	0.60	-2.27	0.000
PCPF	-0.382	22.04	-8.41	0.703
LINCPC	0.501	0.70	0.35	0.617
LINCPF	-1.232	1.55	-1.91	0.219
INCPL	-0.265	0.20	-0.05	0.792
PLSQ	-1.435	0.10	-0.14	0.153
PCSQ	-2.416	1.33	-3.22	0.016
PFSQ	-2.052	0.80	-1.64	0.041
CRISK	0.770	1.21	0.94	0.442
C	0.312	12.42	3.88	0.755

R-squared	0.528514
Adjusted R-squared	0.501102
F-statistic	19.28044
Prob(F-statistic)	0.000000