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Pre-Consolidation and Post-Consolidation of Nigerian Banking Sector: A Dynamic Comparison

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ABSTRACT: The Central Bank of Nigeria's (CBN) recent reform to consolidate the banking sector through drastic increase to #25billion as minimum capital base of any bank led to a remarkable reduction in the number of banks from 89 to 24 in 2005; changed their mode of operations and their contributions to the nation's economic development. Drawing on original research on consolidation of banking sector, this study examined the impact of consolidation on performance of Nigerian banks for the period 1999 to 2011. It employed Chow test; a parameter stability test which showed that there was parameter instability after the consolidation. System GMM (generalized methods of moments) estimation was further used to ascertain the directional and magnitudinal (size) impact of consolidation on the banks' efficiency. With emphasis on earnings per share as a proxy for consolidation, it is inferred that Nigerian banking consolidation exercise did impact their efficiency positively.

Keywords: consolidation; reform; Chow test; dynamic panel; endogeneity; efficiency

JEL Classifications: G21; G28; G29

1. Introduction

The primary objective of Nigerian banks' consolidation reform was to guarantee an efficient and a sound financial system. The reform was designed to enable the banking sector develop the required capacity to support the economic development of the nation by efficiently performing its functions as the head of financial intermediation (Lemo, 2005). Thus, it was to ensure the safety of depositors' money, position banks to play active developmental roles in the Nigerian economy; become major players in the sub-regional, regional and global financial markets and compete favourably with international banks. The Central Bank of Nigeria's (CBN) recent reform to consolidate the banking sector through drastic increase to #25billion as minimum capital base of any bank led to a remarkable reduction in the number of banks from 89 to 24 in 2005; changed their mode of operations and their contributions to the nation's economic development.

Nigeria had the second largest financial sector in Africa in terms of bank assets, market capitalisation, and a number of listed companies in the stock market, after South Africa. Also, banking subsector was the main source of corporate financing in the Nigerian financial sector (Zhao and Murinde, 2009),

The Nigerian banking sector had undergone a number of major changes over the last two decades caused by restructuring and liberalisation of the financial sector as well as technological progress. Before 1987, the Nigerian monetary authorities restricted entry, controlled branch expansion and set both deposit and lending rates. This institutional framework led to a situation of virtually little or no competition in the sector, with the concentration of activities in the four largest banks. In 1990s, a lot of structural reforms were observed in the sector. There was a significant closure of banks, takeover of management and control by the Central Bank of Nigeria (CBN) and the Nigerian Deposit Insurance Corporation (NDIC). The mandatory capital level was increased to #500,000.00, while the statutory minimum risk-weighted capital ratio remained at 8% on average, the number of banks in Nigeria shrank by approximately 22% between 1997 and 1999 (Asogwa, 2004).

The adoption of universal banking in Nigeria necessitated the CBN to strengthen the regulatory and supervisory framework. The requirement of capital base was again increased to #2 billion in 2002 while the risk-weighted capital ratio was raised to 10%. In 2004, the CBN announced a new 13 point reform agenda which was intended to promote soundness, stability and efficiency of the Nigerian banking sector and to enhance its competitiveness in the African regional and global

financial system. One of the 13 point agenda was to raise the minimum capital base to #25 billion approximately 18 months (December, 2005) after the announcement with the statutory minimum risk-weighted capital ratio maintaining at 10%. When the new reform was announced, out of the 89 banks operating in the banking sector, about 5-10 banks' capital base was already #25billion; 11-30 banks' capital base was within #10 to #20 billion; the remaining 50-60 banks were quite below #10 billion (Zhao and Murinde, 2009).

The attempt to meet the minimum capital base triggered the merger and acquisition in the industry. Further, banks raised capital from local as well as foreign direct investment. This led to the increase in the industry's capitalisation as a percentage of stock market capitalisation and market's liquidity during its 2005-2006 financial year. At the end of the 18 months given by the CBN, only 25 out of 89 banks were standing with 21 private publicly quoted banks, 4 foreign banks but no government-owned bank. The reform brought about changes in size, structure and operational characteristics of the Nigerian banking system (Ibid). Eventually, 24 larger and better-capitalised banks are currently in operations in Nigeria.

It is argued that consolidation could increase banks' propensity towards risk taking through increases in leverage and off-balance sheet operations (Somoye, 2008). Furlong (1994) stated that an early view of consolidation in banking was that it made banking sector more cost efficient because larger banks could eliminate excess capacity in areas like data processing, marketing or overlapping branch networks.

Table 1 depicts trend of minimum paid-up capital of commercial and merchant banks in Nigeria between 1952 and 2010. It had been an upward movement since independence till date. The paper investigated the impact of consolidation on performance of banks in Nigeria. The main contributions of the paper are in two fold. First, it fills gaps in the literature with particular reference to Nigeria's banking reform exercises. Second, it employs dynamic panel as a methodological innovation to investigate the performance differential between pre-consolidation and post-consolidation periods. The remainder of the paper is as follows: Section 2 reviews past studies while methodology and data are described in section 3. Main results and discussion (with robust tests) are presented in section 4 and section 5 concludes the paper.

Table 1. Overview of Minimum Paid-up Capital of Banks in Nigeria (1952 - 2010)

Year	Type Of Bank	Minimum Capital Requirement (Mkr)
1952	Commercial Banks	£12,500.00
1969	Commercial Banks	£300,000.00
1979	Commercial Banks	#600,000.00
	Merchant Banks	#2,000,000.00
1988 (Feburary)	Commercial Banks	#5,000,000.00
	Merchant Banks	#3,000,000.00
1988 (October)	Commercial Banks	#10,000,000.00
	Merchant Banks	#6,000,000.00
1989	Commercial Banks	#20,000,000.00
	Merchant Banks	#12,000,000.00
1991	Commercial Banks	#50,000,000.00
	Merchant Banks	#40,000,000.00
1997	Commercial Banks	#500,000,000.00
	Merchant Banks	#500,000,000.00
2000	Commercial Banks	#1,000,000,000.00
	Merchant Banks	#1,000,000,000.00
2001	Commercial Banks	#2,000,000,000.00
	Merchant Banks	#2,000,000,000.00
2005-date	Commercial Banks	#25,000,000,000.00

Source: Author's computation, 2013.

2. Review of Relevant Literature

Strand of financial literature has examined the effects of financial reforms on banks' performance measured by either efficiency or productivity without comparing their business cycles (pre and post-consolidation). This study fills the gap.

Berger and Allen (1998) examined mergers which occurred in the 1980s that involved banking organizations with at least \$1 billion in assets and got to a conclusion as a result of the data aggregated to the holding company level, using frontier methodology and the relative industry rankings of banks participating in mergers. Frontier methodology involves econometrically estimating an efficient cost frontier for a cross-section of banks. For a given institution, the deviation between its actual costs and the minimum cost point on the frontier corresponding to an institution similar to the bank in question measures X-efficiency. They found out that, on average, mergers led to no significant gains in X-efficiency.

Molyneux, Altunbas and Gardener (1997) underscored the importance of efficiency in banking and pointed out that higher efficiency could be expected to 'lead to improve financial products and services, a higher volume of funds intermediated, greater and more appropriate innovations, a generally more responsive financial system, and improved risk-taking capabilities if efficiency profit gains were channeled into improved capital adequacy positions. They opined that bank efficiency was of critical importance to the evaluation of bank's performance.

Onaolapo (2008) employed CAMEL rating system to examine the effectiveness of recapitalization. He found that recapitalization had improved the financial health of banks. This finding was collaborated by Sani (2004). Using a regression model, Sani discovered a positive and significant relationship between recapitalization policy and economic growth in Nigeria. To the contrary, Adegbaju (2008) examined the effectiveness of recapitalization on the performances of 20 Nigerian banks. He discovered that while few banks recorded appreciable improvements in their performances, majority of the banks remained the same or even worse off.

Okafor (2009) research on consolidation exercise in Nigeria employed capital adequacy asset quality liquidity and management. 2004 -2005 was regarded as the pre consolidation period while 2006-2009 was regarded as the post consolidation period, she concluded that consolidation improved the overall performance of banks in terms of assets size, deposit base, capital base and capital adequacy, however it did not contribute to the profit efficiency of those commercial banks.

Using the dynamic panel GMM method on a cross sectional data from 2000 -2010, Barnos and Caporale (2008) came to a conclusion that consolidation specifically reduced foreign ownership of commercial banks and also through merger and acquisition banks were more cost efficient.

The investigation carried out by Elumilade (2010) on the effects of mergers and acquisitions on the efficiency of financial intermediation in the Nigerian banking industry had evidence that the consolidation programme induced mergers and acquisitions in the banking industry and improved competitiveness and efficiency of the borrowing and lending operations of the Nigerian banking industry.

Olaosebikan (2009) investigated the efficiency of the Nigerian banking system between 1999 and 2005. Bank efficiency was evaluated using Data Envelopment Analysis (DEA). The results indicated that efficiency fluctuated during the first part of the period and improved during the recent years, a period associated with the increase in minimum capital requirement, differences in banks' efficiency was explained by problematic loans and their size.

Donwa and Odia (2011) investigated the impact of the consolidation on banking industry in the Nigerian Capital Market between 2004 and 2008 using primary (questionnaires) and secondary data from the Nigerian Stock Exchange. When the data was analyzed with the chi-square test and ANOVA, it was found that bank consolidation affected the industry significantly as most of the banks had to go to the capital market to raise the required amount by issuing securities. They submitted that banks' consolidation had increased public awareness and operations of the Nigerian capital market just as the capital market had continued to be an easy and cheap source of funds for banks in the post-consolidation era. Based on their findings, it was recommended that the banks and capital market regulatory authorities should continue to monitor and institute reforms program that would better reposition the banking industry as a major player in the Nigerian Capital Market and the economy.

Adegboyega (2012) evaluated the impact of mergers and acquisitions on performance of Banks in Nigeria. Pre-merger and post merger financial statements of two consolidated banks were

obtained, adjusted, carefully analyzed and compared. The result revealed that all the two groups produced in addition to operational and relational synergy, financial gains far more than the 2+2=5 synergistic effects. Ratio technique and inferential statistical tools were used to highlight synergistic effects on the merging banks.

Berger and Udell (1995) used 1980-1988 as its study scope and the Thick Frontier Approach (TFA) method. The study found out that deregulation of deposit rates caused an increase in average cost in US banks especially the smaller ones, hence it led to reduced efficiency while during post-deregulation periods, and their average coast fell owing to the structural change.

Sobodu and Akiode (1995) employed data envelopment analysis (DEA) to study the efficiencies of banking institutions in Nigeria under the privatisation policy, the study showed that the efficiency of the Nigerian banking system declined significantly during period of financial deregulation compared to its levels before consolidation, they also discovered that privately owned banks operated more efficiently than government owned banks.

Favero and Papi (1995) used a sample consisting of 174 Italian banks, which represented 80 percent of total deposits, cross-sectional data from 1991 to 1995 and used the Data Envelopment Analysis (DEA) as its methodology. The major findings showed that efficiency of banks was mainly determined by productivity and specialisation by bank size and lesser by their locations.

Erel (2006) studied the effect of bank mergers on loans price. He found out that on average mergers reduced loan spreads, and that the results were stronger for acquirers with large declines in operating cost post merger. According to him, merger and acquisitions did not decrease the spread of the loans, because, by the time one or more banks were merged together at least they would be stronger more than before and that would allow them to spread credits to borrowers more than before.

Lamberte and Manlagnit (2004) examined the recent consolidation trends among depository institutions (commercial banks and thrifts) in Philippine for the period between 1989 and 1994. The study found out that market concentration increased significantly, midsize commercial banks were gaining market share at the expense of large banks in most markets. In addition, Roger and Ferguson (2009) studied the financial consolidation. Their study concluded with an extensive evaluation of the potential effects of financial consolidation on the efficiency of financial institutions, competition among such firms, and credit flows to households and small businesses

According to Wilson, Wilson and Goddard (2008) consolidation in the US had empirical evidence that there was often little improvement in efficiency or performance of merged entity. The study also suggested that the hubris and agency motives for merger may be relevant, or that synergy derived more from enhanced market power than from cost savings

De young (1993) studied 348 merged banks, of which 43 percent were intercompany ones. The study estimated pre- and post-merger cost efficiency by applying a thick frontier approach. Prior to merger, the acquiring banks were more cost efficient than the target; however, in the three years period after the merger, cost efficiency improved in about 64 percent of the cases.

3. Methodology and data

The theory of efficiency was the theoretical foundation of the study. This study employed Generalized Methods of Moments (GMM) a more captivating method, which combined both time series and cross sectional data; it is highly useful because of the dynamic nature of the variables used. It made use of secondary data of 20 out of the 24 consolidated banks currently operating in Nigeria between 1999 and 2011; sourced from Nigerian Stock Exchange' Fact book (various issues). Variables such as dividend per share (DPS), earnings per share (EPS), deposit, profit after tax (PAT) and loans and advances (L&A) were proxied for consolidation (explanatory) and total assets for efficiency (dependent). The scope was divided into two: six years for pre-consolidation (1999-2004) and six years for post-consolidation (2006-2011).

In exploring the impact of the consolidation exercise on banks' efficiency in Nigeria, the research employed chow test; parameter stability test to ascertain if truly there was a structural break in banks' efficiency after the consolidation exercise. Since the chow test gave a fore knowledge as to the presence or absence of structural break, System GMM (generalized methods of moments) estimation was further used to ascertain the directional and magnitudinal (size) impact of consolidation on banks' efficiency.

3.1 Model specification

The chow test formula is specified as:

$$F(K,N_2+N_2-2K)=(SSE_P-(SSE_1+SSE_2));K, (SSE_1+SSE_2); (N_1+N_2-2K)$$
 Where:

 SSE_p = sum of squared error term for pooled model

 SSE_1 =sum of squared error term for group 1

 SSE_2 =sum of squared error term for group 2

K= no of estimated parameter (including constant)

 N_2 = no of banks in pre consolidation period

 N_2 =no of banks in post consolidation period

A dynamic panel is the estimation technique this research employed, it is a model in which the current value of the dependent variable (y) is a function of the current value of independent variable and a lagged value of y, a typical dynamic is given as:

$$Eff_{it} = \beta_1 Eff_{it-1} + \beta_2 (DPS_{it}) + \beta_3 (EPS_{it}) + \beta_4 (DEPOSIT_{it}) + \beta_5 (PAT_{it}) + \beta_6 (L&A_{it}) + \tau_t + \psi_{i} + \varepsilon_{it}$$
Where; (2)

 Eff_{it} is the proxied for total assets of bank I at time t

 Eff_{it-1} is the lagged value of total assets of bank I at time t

 (DPS_{it}) is the dividend per share of firm I at time t

(EPS_{it}) is the earnings per share of firm I at time t

(DEPOSIT_{it)} is the total deposit of firm I at time t

 (PAT_{it}) is the profit after tax of firm I at time t

($L\&A_{it}$) is the total loans and advances of firm I at time t

 τ_t represents time effects

wi represents the firm specific fixed effects

 ε_{it} represents the stochastic term.

 $\beta_1...\beta_6$ are the coefficients of the parameters.

4. Results and Discussion

4.1 Chow Test

The Chow test shows that there is parameter instability in the bank consolidation. The following facts emerged:

F-statistics (5, 219) = 3.22

P - Value = 0.008

The piece of fact extracted from the result showed an F-statistics value that was significant at 5% level of significance, thus giving adequate information to reject the null hypothesis which asserted that there was no parameter instability in the model tested, implying that indeed the consolidation exercise impacted banks' efficiency in Nigeria.

4.2 Dynamic panel data estimation

Owing to the technical deficiency of the ordinary least square and generalized least square estimation techniques, (both of which provide the econometric framework for the pooled regression, fixed effect method and random effect method of estimating panel models), the system GMM technique is employed as it helped contain the auto-correlation tendencies in the dynamic panel model. The Difference GMM estimator (a close alternative) does not include level equations in its estimation. The system GMM estimator however includes both level and difference equations, generates more efficient instruments for estimation and also useful in correcting the endogeneity bias, which is peculiar to dynamic panel models.

In this wise, the result of the system GMM is presented in Table 2 for both pre-consolidation and post-consolidation periods.

Table 2. Pre and post-consolidation's results

Dependent variable: Total Asset

Variables	Pre-consolidation	%	Post-consolidation	%
Asset-1	0.00378852	0.003	0.46896078*	0.47
PAT	0.30632521*	0.31	0.1050969	0.11
DEPOSIT	0.4701028*	0.47	0.33065887	0.33
EPS	0.14763619	0.15	0.08230442**	0.82
DPS	-0.03691459	0.37	0.02566863	0.26
L&A	0.30243556*	0.30	0.11103173	0.11

Note: * p<0.05; ** p<0.01;

Independent variables: (PAT, Deposit, DPS, EPS, L&A)

Diagnostics results:

Pre-consolidation:

Arellano-Bond test for AR (1) in first differences: z = -1.66 Pr > z = 0.096Arellano-Bond test for AR (2) in first differences: z = -1.44 Pr > z = 0.151Hansen test of overid. Restrictions: chi2 (5) = 0.00 Prob > chi2 = 1.000 Post-consolidation:

Arellano-Bond test for AR (1) in first differences: z = -1.42 Pr > z = 0.156Arellano-Bond test for AR (2) in first differences: z = -0.05 Pr > z = 0.958Hansen test of overid. Restrictions: chi2 (5) = 3.36 Prob > chi2 = 0.499

The diagnostic tests indicate that the instruments used to check the endogeneity problems are valid and strictly orthogonal with the regression disturbance term. In addition, the autocorrelation test shows that there is no second order serial correlation problem and therefore the lags of the dependent variable and other variables used as instruments are strictly exogenous, thus good instruments (Blundell et al., 2000; Bond, Hoeffler and Temple, 2001 and Hoeffler, 2002).

Quantitatively, as revealed in table 2 (the percentage column) consolidation, though positively impacted banks efficiency but had minimal impact. Evident from the table 2 shows that a one percent increase in profit after tax and deposit brings about 0.10% and 0.33% increase respectively in total asset (proxy for banks' efficiency). Further, banks' efficiency proxied by total assets improves by 0.82% and 0.11% via the consolidation exercise resulting from a one percent increase in earnings per share (EPS) and loans & advances respectively.

Table 2 reveals that consolidation actually had a declining impact on majority of the adopted proxies for banks' efficiency. The results show that profit after tax (PAT), dividend per share (DPS), loans and advances (L&A), bank deposit (DEPOSIT) all have a reducing effect on total assets, which is the adopted index for banks' efficiency. However, earnings per share (EPS) reveal that consolidation does impact banks' efficiency. The results further indicate that it is 99% statistically significant in determining efficiency of Nigerian banks. With emphasis on earnings per share as a proxy for consolidation, it is inferred that bank consolidation does impact banks' efficiency positively.

5. Conclusion

Banking consolidation is a matter of concern to CBN, as it may have adverse consequences on the systematic stability of the industry. The magnitude of consolidation effect depends on specific circumstances of each economy, such as regulatory framework, supervision practices, international financial integration, and financial market sophistication. However, since consolidation is likely to continue in the financial markets, further policy measures may be necessary in order to maintain a competitive environment and strengthen market efficiency and profitability. To achieve the intended purpose, these policies have to work with the incentive structure of market forces, including technological progress and international financial integration. Further, to ensure the optimum success of the consolidation programme, in particular the post consolidation integration issues, there is the need for the CBN to sponsor training programmers' on post-consolidation integration and corporate culture conflict management. This would assist to mitigate conflicts associated with consolidation, thereby facilitating the sustainability of the mega banks.

The study covered only 20 out of the current 24 mega banks operating in the country due to non-availability of relevant data. It is therefore, suggested that further research in this area of study be conducted on a ten year basis for rigorous comparison.

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