Banking sector consolidation; implications for banks' performance in Nigeria

Nteegah, Alwell and Konboye, Lambert .E.J
Department of Economics, University of Port Harcourt, Nigeria

Abstract
This paper investigates the effect of consolidation on banks' performance in Nigeria. In order to achieve the objective examining how consolidation has affected banks' performance, gross profit, capital base, real GDP, financial deepening, interest rate, and the inflation rate of five (5) deposit money banks were selected and analysedusing the non-linear autoregressive and distributed lag (NARDL) method. The result shows that only capital base has both short run and long run asymmetry with bank performance. This was evidenced in the Zenith bank model result. Also positive shock in capital base exerted positive effect on performance in Zenith, UBA and Eco banks while positive shock in capital led to negative effect on the performance of FCMB and Diamond banks. The result also revealed the absence of asymmetry between real GDP, financial deepening, interest rate, inflation and banks' performance in all the five model studied. This implies that shocks in these variables exerted less influence on the performance of the banks. This study also found that 99%, 94%, 81%, 78% and 57% of the change in profits was determined by the level of capitalisation for Zenith, Eco, UBA, FCMB and Diamond Banks respectively. The implication of the result is that a strong capital base (consolidation) enhances banks' profitability in Nigeria. Based on these findings, this study recommends that banks should regularly go through periodic capital base reviews in order to enhance their performance in Nigeria's dynamic financial market.

Keywords: Consolidation, profitability, capital base, GDP, financial deepening, inflation rate, NARDL

1. Introduction

Insufficient capital base has been identified as a crucial variable responsible for low performance and instability in the Nigeria's banking industry over the years, stretching from modern times back to the colonial period. During the colonial period (1892 -1959), two sets of banks existed in Nigeria, referred to as domestic banks and foreign-owned banks, which existed and operated side by side in conducting banking businesses. Investigation revealed that the foreign-owned banks were relatively more highly capitalised than the indigenous banks and were discriminated in their operations (Onoh, 1982). The indigenous banks were characterised by frequent instability and depression, which led to the collapse of most of the commercial banks, which were liquidated in quick succession (Nnanna, 2005). The foreign-owned counterparts survived this turbulent banking environment because of their strong capital base and the availability of highly skilled manpower.

Lemo and Imala (2005) argued that, before consolidation, bankers were engaged in unethical competitive behaviour as a result of the poor capitalisation of banks and this practice, leading to rent-seeking and business not related to core banking activities among the Nigerian banking financial institutions. Nnanna (2005) argued that, in historical context, the Nigeria banking system had gone through four phases. (a) The first era was described as unguided laissez-faire phase (1930-1959). During that period several undercapitalised and poorly supervised banks collapsed in their infancy. (b) The second phase was referred to as control regime (1960-1985). During this time the CBN ensured that only fit and proper persons were permitted to have licence and banks were subjected to a prescribed minimum paid-up capital base. (c) The third phase was described as post-structural adjustment programme (1986-2004). This period was characterised by neo-liberal philosophy where the free entry and exit of banks was over-stretched and obtaining licence was predicated on political patronage. (d) The emerging fourth phase is the era known as banking consolidation (CBN, 2004), with a major emphasis on the merger and acquisition of banks and other reforms.

In spite of the crucial role played by mergers and acquisitions (M&A), which led to the emergence of consolidated banks in the sub-sector, the reforms were enunciated by the government, primarily to promote investments in the banking industry to facilitate real sector growth and economic development (Soludo, 2004). It should also be noted that all the reforms instituted by the financial sector have improvement in capital base as its major

component. Hence minimum capital base of banks increased from N400,000 1970-78; N1.5m 1979 – 1987; N10m in 1988; N20m 1989 – 1990; N50m 1990 – 1995; N500m 1996 – 2001; N2billion 2002 – 2003 to N25billion from 2004 – Date (CBN, 2018). Though capital base of banks has increased over the years, most banks in Nigeria still experienced performance crisis. This paper seeks to examine how capital base of banks has affected the performance of banking sector in Nigeria. We continue our discussion by reviewing relevant literature, follow by the methodology used in achieving the objectives, results and findings and conclusion.

2. Literature Review

The Structure-Conduct-Performance (SCP) by Mason (1939) states that increasing market concentration brings about oligopolistic tendencies and declining competitive behaviour of firms, resulting in higher prices and falling output in industrial organisations. The basis of this argument is that increasing levels of concentration (structure) enhances collusive and manipulative behaviours of banks, leading to the setting of higher prices and a reduction of output level (conduct), which eventually promotes higher performance (Mason, 1939). In another development, the SCP theory is a model of a relationship that influences the market structure, conduct, and performance of a firm in within an industrial organisation. In a study of Ghana on M&A by King Salami (2015), revealed that the impact of M&A had been focussed on testing the validity of efficiency hypothesis and structure-conduct performance (SCP) hypothesis. Investigations revealed that the efficiency hypothesis is predicated on economies of scale, while other gains from efficiency are all transmitted to various stake-holders as customers through better competitive prices. Moore and Frederick (1959), on the other hand, argued that the structure conduct performance hypothesis on M&A is aimed at exploiting marker power and imposition of increased prices in the economy (Mason, 1939, Bain, 1951; 1954). The term structure, in this model, denotes a framework referring to the number of existing banking institutions operating in the whole industry (Nabieu, 2013). Market structure is affected by indigenous and exogenous factors. The internal variables include regulation and competitions, while the exogenous factors are economic, population, and technological dynamics. The term “conduct” describes the behaviour of the financial system in terms of the marketing, pricing, and innovation of the banking business environment and the term “performance” describes the quality and quantity of the products and services which are provided within a banking industrial organisation.

According to Mustapha (2014), in terms of structural development, the banking industry in Nigeria has gone through a chequered history. In 1959, there were only eight banks with 160 branches in the Nigerian banking environment. However, since independence, this figure has increased to forty banking institutions, with 1,316 branches spread across the country by December 1985. This period was characterised by heavy regulations which hampered competition, efficiency, and growth in the banking industry. The study revealed, that following the introduction of neo-liberal policies in 1986, the number of banks increased unprecedentedly, and subsequently, most of the institutions collapsed because of a lack of adequate capital, mismanagement, and the absence of an effective regulatory environment. By 2004, the number of banks in the country reached 89, with varying sizes. Structurally, the industry exhibited a very high level of concentration, as 10 of the biggest banking institutions accounted for roughly 50% of the total assets and liabilities of the banking industry (Soludo, 2004).

Investigation reveals that the capital base of Nigerian banks was small compared to other countries, like Malaysia and South Africa. The small size of each existing bank, with high operating costs such as high investment in technology, separate costly headquarters, and high fixed and operating expenses, lead to high average cost of operations and widespread deposits and lending rates with heavy cost of intermediation. Attempts to survive in this harsh business environment led to unprofessional and sharp practices (professionally unethical conduct) by players in the industry. In an attempt to save the situation, the Central Bank of Nigeria introduced banking consolidation and reforms in 2004, which affected the existing structure of 89 banks by reducing them to 25; subsequently, another M&A of the banks reduced the number of institutions to 24 (Soludo, 2004; Sanusi, 2010).

Myriad of empirical works exist on the relationship between consolidation and bank's performance.Alexiou and Sofoklis (2009) studied the effects of bank-specific and macroeconomic determinants of bank profitability using an empirical framework incorporating the traditional Structure-Conduct-Performance (SCP) hypothesis. A panel approach was used to analyse six Greek banks with the results indicating macroeconomic factors such as inflation and private consumption appearing to play a significant role in shaping the performance of banking institutions. Additionally, bank-specific variables, such as capital, also play a critical role in determining bank profitability in Greece.

Lloyd-Williams, Molyneux and Thornton (1994) investigated the relevance of the SCP and efficient market hypothesis to analyse the Spanish banking industry using a "three firms" concentration ratio and market share of an individual firm to represent a firm's efficiency. The regression result revealed a direct relationship between the market concentration and the performance of banks giving credence to the SCP hypothesis for the Spanish banking industry.

Kosmidou (2008) used an unbalanced pooled time series data for 23 banks to examine the factors influencing the performance of Greek banks during the period of EU financial integration (1990-2002). The result shows that an increase return on average assets (ROAA) was related to well-capitalised banks and a lower cost to income ratios. Bank size was positive in all cases but statistically significant only when the macroeconomic and financial structure variables were included in the models. Macroeconomics and financial structure-like growth of gross domestic product (GDP) exhibits a significant and positive impact on ROAA, while inflation has a negative but significant effect on bank profits.

Albertazzi and Gambacorta (2009) evaluated banking profitability shocks to both macroeconomic and financial factors by examining a set of equations for net interest income, non-interest income, operating costs, provisions, and profit before taxes, for banks in the main industrialised countries principally the Euro area and Anglo-Saxon countries. The study reports a significant relation between real GDP growth and bank profitability in European countries.

Calza, Gartner and Sousa (2003), employ the Johansen methodology to investigate the factors influencing loans to the private sector in the European countries. Their findings indicate that, in the long-run, real loans are directly linked to real GDP and negatively to real short-term and long-term interest rates. The study also indicates a long-run demand equation. In estimating the short-run dynamics using the Vector Error Correction Model (VECM), the result also indicates no signs of structural breaks during the sample period (1980 Q1 - 1999 Q2). All of this suggests that developments in real loans to the private sector in the EEC area can be reasonably explained by the model. This finding implies that real GDP has a serious implication on loans to the private sector with regards to banks performance in this model.

Claeys and Vander Vennet (2008) similarly studied the determinants of bank interest margins in the Central and Eastern European countries (CEEC) and found that banking in the CEEC is

on a virtuous path, at least in the EU accession countries. They also discovered that increased efficiency benefits customers, while capital adequacy supports systemic stability. The study further found a strong nexus between the price level, financial intermediation and economic growth, as funding costs have a serious implication on the investment level and capital allocation. It also has an impact, in turn, on growth potential and the direction of economic activity, which affects the profitability of the banking sector, and therefore its stability and ability to support the real economy. The implications of their finding are that the interest rate, the inflation rate and financial development have serious implications for bank interest margin or performance.

Pasiouras and Kosmidou (2007) submitted that large bank size is positively related to bank profitability. To them, larger banks are likely to have a higher degree of product and loan diversification than smaller banks, which reduces risk due to economies of scale from a larger size. They further argued that reduced risk and economies of scale lead to increased operational efficiency, and hence, a positive effect on bank profitability. This finding demonstrates that an increase in bank size which results from merger and consolidation, impacts positively on a bank's performance.

Dietrich and Wanzenried (2011) studied the extent to which bank-specific features, macroeconomic variables, and industry-specific factors affected the profitability of 453 commercial banks in Switzerland, over the period 1999 to 2008. To achieve the objectives of study, the bank crisis period was separated into the following areas: The years before banking of crisis 2006 and the crisis years 2007 and 2008. The result indicated that better-capitalised banks seem to be more profitable. While the cost-income ratio was found to be relevant to the return on assets before the crisis only, the negative impact of the loan loss provisions relative to total loans is much stronger during the crisis. The finding of the study further revealed that if a bank's loan volume is growing faster than the market size, the impact on bank profitability will be positive, at least before the crisis. The findings also show that banks with a higher interest income share are less profitable, which holds again for the pre-crisis period only. In addition, the negative effect of state ownership on bank profitability does not hold during the crisis, and the same holds for foreign bank ownership. Finally, certain industry-specific and macroeconomic variables like real GDP and the interest rate also have significant effect on profitability of banks. These findings imply that capital base and

macroeconomic factors – real GDP, interest rate and price level - have serious implication on a bank's profitability.

Garcia-Herrero, Gavila and Santabarbara (2009) examined the determinants of profitability for Chinese banks using panel data for 87 banks from 1997 to 2004. The result of their investigation shows that better capitalised banks tend to be more profitable. The result was same for banks with a relatively larger number of deposits and for more X-efficient banks. Another serious finding was that a less concentrated banking system increases bank profitability, which reflects the concept that SOCBs have been the major bulwark due to their size and performance. The macroeconomic variables, like real interest rates on credits and inflation, stimulated profitability, whereas the volatility of interest rates reduces it. In addition, profitability of banks appears to be quite consistent in China, which indicates impediments to competition due to government regulation. This reason shows that government decisions affect profitability of banks in China.

The findings of the study by Iannotta, Nocera and Sironi (2007) confirms a significant difference in performance and risk. Specifically, the result shows that private banks enjoy a higher profitability than mutual and public-sector banks. To the author, the improved profitability performance emanates from a higher net return on their earning assets rather than from a superior cost efficiency. The findings further revealed that public and mutual bank's costs are relatively lower. It also shows that in term of risk, public sector banks have a poorer loan quality and a higher insolvency risk than other types of banks, while mutual banks have better loan quality and lower asset risk than both private and public-sector banks. This finding supports the bank consolidation structure-conduct-performance theory.

Kasman, Tunc, Vardar and Okan (2010), studied consolidation and commercial bank net interest margin using evidence from the old and new European Union using panel analysis over the period (1995 –2000). The findings from the study show that all the explanatory variables were positively related to the bank's net interest margin in the initial sub-period, except for the size, managerial efficiency, GDP growth, and capitalisation. Bank size was found to have a negative and significant impact on the net interest margin. Managerial efficiency had a negative and significant coefficient, suggesting that banks experiencing managerial efficiency are able to obtain interest loans and lower cost deposits. Real income (GDP) had a negative and significant effect on interest margin. This behaviour could be

traced to the relatively high volatility of the business cycle in new EU member and candidate countries where periods of economic growth have sometimes been interrupted by periods of crisis. The results further indicated that market power, operating costs, capital adequacy, default risk, credit risk, implicit interest payments and inflation are all positively and significantly related to a bank's net interest margins. The positive impact of price level suggests that a lower price level has a serious diminishing impact on long term compared to short-term interest rates, leading to a decline in net interest margins.

Pasiouras and Kosmidou (2007) studied the factors affecting the profitability of European domestic and foreign banks, using an unbalanced panel data set of 224 observations, covering the period 1995- 2002. Findings from the study show that capital base is the major factor influencing bank profit in the United Kingdom. Other significant variables affecting profitability, as revealed in the study, were cost-to-income ratio and bank size, both of which impact negatively on bank profits. In specific terms, liquidity was negatively related to the net interest margin but positively related to ROAA. The impact of loan loss reserves was also not certain, being positive and significant on NIM, implying that higher risks result in higher margins but are negative and insignificant on ROAA.

Staikouras, and Wood (2003), in their study on determinants of profitability of banks in Europe, found a positive relationship between bank liquidity and profitability. They also found that banks holding more liquid assets benefit from a superior perception in funding markets, reducing their financing costs and increasing their profitability. Angbazo, (1997) assessed and identified the determinants of net interest margin in the Ethiopian banking industry using an unbalanced panel data gathered from commercial banks and the National Bank of Ethiopia for the period 1997 to 2014, examining the effects of changes in internal and external factors on the performance of banks. The findings of the study indicated that cost efficiency, implicit interest payment, competition and scale efficiency had a consistently positive and significant effect on the net interest margin. Whereas, liquidity risk and management efficiency had negative and significant effect on the net interest rate margin. However, inflation and gross domestic product did not exert a significant impact on the net interest rate margin. The study by Angbazo concludes that both bank specific and industry factors are indispensable determinants of commercial bank's performance in Ethiopia.

Adegbuju and Olokoyo (2008) found in their study that, as a developing economy within the global community, the financial sector in the nation's economy in the past years has experienced unparalleled changes in ownership structures and rapid development in banks' operational mechanism.

Adequate capitalisation of banks is a necessary condition in order for banks to acquire fixed assets to absorb shock during an emergency, for infrastructural development and free funds for branch expansion programmes, including confidence building in the general public (Ogunleye, 1997). The indigenous banks were unable to perform the foregoing functions adequately, accounting for their early liquidation, with these factors forming the founding pillars upon which the international banks grew and expanded in the same environment where the domestic banks were wobbling (Ayodele, 1988; Onoh, 2002; Oghafor, 2012). The study revealed that during the post-independence era, the low capital structure of banks still arose as a crucial factor and a recurring decimal that precipitated the continual systemic banking instability until recent times, when the Central Bank and the Federal Government introduced the banking consolidation policy in 2004 (CBN, 2008).

The work by Nwankwo (2012) used multiple panel regression analysis in its interpretation, incorporating money supply, GDP, interest rates, and excess reserve without capital base, which was the main focus of the present study, making it different in approach and focus from previous studies. The performance of the Nigerian economy is affected by a wide range of factors based on fiscal and monetary policies. This means that deficit financing by the federal government, trade policies, exchange rate determination, and balance of payment management, including different subsidy regimes together, can also affect the behaviour of an economy.

The behaviour of the Nigerian economy is affected by many macroeconomic variables, including banking consolidation. The effects of the other macroeconomic variables in the economy manifest in multidimensional ways that intervene in the assessment of the specific impact of consolidation on the performance of banking sub-sector. This explains why the current study focuses specifically on the impact of consolidation on performance in the banking sub-sector, rather than investigating the impact of consolidation on the performance of the Nigerian economy generally. Performance is measured in terms of profitability. These

are gaps and weaknesses that make the present work original and different from the previous studies in the field investigated.

3. Methodology

The triangular relationship of Structure-Conduct-Performance(SCP) hypothesis argues that an increasing level of concentration (structure) enhances the collusive and manipulative behaviour of banks, which leads to the setting of higher prices and a reduction in output, which eventually promotes higher profitability (Mason, 1939). On the other hand, the efficient market hypothesis shows that a very sound institution, in relation to its competitive environment, can optimise profitability by controlling its existing size and price policies or reducing its price and expanding its operational mechanism. This implies that only an operationally viable firm can elucidate the direct link between profitability and expansion (Bello and Isola (2014). Consolidation widens the scope (structure) of deposit money banks through merger and acquisition and also makes banks less competitive. Increase in bank size and less competition, all things being equal, could stimulate the profit of banks. Earlier studies on structure-conduct-performance and efficient market hypotheses are, Lloyd-William, Molyneux and Thornton (1994), on bank performance in Spanish banking industry and the Alexious and Sofoklis (2009) study of the determinants of profitability in Greece. Both studies also used the panel analysis methodology.

Given the above background, the study adopted a modified Structure-Conduct-Performance (SCP) framework, which postulates that as a small number of firms constitute the larger share of the market/industry, the structure moves from perfect to imperfect competition. This development forms the basis of the collusion hypothesis that characterises oligopoly and other imperfect markets. According to Tule et al (2016), the SCP model simply implies that increasing market concentration leads to less competitiveness in terms of higher prices and less output, resulting in higher profits at the expense of lower consumer welfare. However, the authors criticised the SCP hypothesis on the ground that it constrains the user to capture the structure, conduct and performance, while at the same time, making it difficult to isolate each feature one at a time.

The study also adopts a major empirical method proposed by Panzar and Rosse (1982, 1987) – the P-R model. This model, according to Tule et al (2016), has been successfully used to remedy the shortcomings of the SCP model by testing the conduct directly without recourse

to industry structure. The P-R model determines the competitive appetite of banks using the comparative features of the reduced-form revenue functions based on cross-sectional data. It assumes that a bank maximises its profits at the point where marginal revenue is equal to marginal cost. Assume that a bank's revenue function is defined as:

$TR_i = TR_i (X_i, Y_u)$

Where: X_i= a vector of output of bank I and

Y_u = a vector of exogenous variables which affect the revenue function of bank i.

Profitability/performance of banks is defined in terms of the output vector, while the exogenous variables define the capital base, interest rate, real GDP, price level and financial growth.

To further analyse the impact of banking sector consolidation on the performance of banks, the study uses a regression model to examine how consolidation has impacted on the performance of deposit money banks in Nigeria. Earlier work by Park (2012) and recent work by Tule et al (2016) used net interest margin as a measure of performance, this study however, deviated from these studies by using gross profit of banks as a measure of performance since the accounting profit is the main indicator for measuring the financial performance of the enterprise (Trujillo-Ponce, 2010). Hence in this study, we estimated a bank performance equation defined thus:

$Prft_i = f(CAP_i, MACRON_i)$

Where: $Prft_i$= gross profit of banks

CAP_i, = banking sector consolidation defined in terms of level of capitalisation

$MACRON_i$= macroeconomic environment or exogenous variables that affect bank performance, such as real income level (GDP), price level (INFR), interest rate (INTR) and financial growth (MSS/GDP). In order to achieve the objectives of this study, gross profit, capital base of the selected 5 banks and the identified macroeconomic variables were incorporated into the performance model. These banks were selected from 24 banks doing business in Nigeria, using the purposive sampling technique (Campbell, 1955; Bernard, 2002; Seidler; 1974 and Tremblay, 1957). The prevailing interest rate, inflation rates, real GDP and

level of financial deepening for the four quarters of 2001–2016 were analysed using the non-linear autoregressive distributed lag approach.

$$PRFT_{it} = \mathrm{f}\left(CAP_{it},\ INTR_{it}, \mathrm{FID}_{it,} GDP_{it}, INFR_{it}\right) \qquad 1$$

Where: $PRFT_{it}$= profit of the selected 5 banks; $CAPB_{it}$= capital base of the 5 selected banks; $INTR_{it}$= interest rate (lending rate) of the banks; FID_{it}= level of financial deepening; $RGDP_{it}$ = real GDP; $INFRg_{it}$ = inflation rate/price level. During estimation, parameters are introduced and a disturbance term 'u' to take care of variables not included in the model, but those that affect economic growth. Hence, equation 1 above is transformed as follows:

$$PRFT_{it} = \beta_i + \beta_1 CAP_{it} + \beta_2 INTR_{it} + \beta_3 FID_{it} + \beta_4 GDP_{it} + \beta_5 INFR_{it} + u_{it} \quad 2$$

Dynamic Specification of the Non-Linear Autoregressive Distributed lag (NARDL) Model for Banks' Performance in Nigeria

The unit root tests result revealed that the variables under consideration were stationary at either level i(0) or first difference i(1) hence the used of NARDL methodology. The nonlinear ARDL model is a recently developed model by Shin et al. (2014). It is different from the non-linear ARDL model by Pesaran et al. (2001). The NARDL explains for imbalances (asymmetries) in the movements of variables. Its simultaneously performs well in small samples and it is applicable in mixed order integrated variables. It also deals effectively with pre-testing bias in a model. It should be noted that most economic relationships are non –linear, hence NARDL tends to account for such relationship in its analysis.

In order to estimate the effect of banking sector consolidation on performance (profitability), the NARDL model of performance and the interacting variables (independent variables) is stated below.

$$\Delta PRFT_{it-1} = \sum_{i=1}^{n} \alpha_0 \Delta PRFT_{it-1} + \sum_{i=1}^{n} \alpha_1 \Delta CAP_{it-1} + \sum_{i=1}^{n} \alpha_2 \Delta GDP_{it-1} + \sum_{i=1}^{n} \alpha_3 \Delta INTR_{it-1} + \sum_{i=1}^{n} \alpha_4 \Delta INFR_{it-1}$$
$$\sum_{i=1}^{n} \alpha_4 \Delta FID_{it-1} + \delta_0 \Delta PRFT_{it-1} + \delta_1 \Delta CAP_{it-1} + \delta 2\, \Delta GDP_{it-1} + \delta 3\, \Delta INTR_{it-1} + \delta 4\, \Delta INFR_{it-1} + \delta 5\, \Delta FID_{it-1} + \varepsilon_{it} \qquad 6.2$$

It is pertinent that so many relationships among economic variables tend to follow a non-linear path as opposed to the more common linear assumptions. The speed at which macroeconomic variables move in the downward direction is often not the same as that of the

upward side, thus suggesting non-linear behaviour. Consequently, the information content embedded in linear relationships may not be appropriate in enhancing strong inference and findings (Shin, Yu and Greenwood (2014). The implication of the foregoing is that the swinging of positive and negative components of regressors around an assumed zero threshold have crucial role to play in establishing long run relationships among the variables.

The asymmetric ARDL of Shin, Yu and Greenwood (2014) derive from the expansion of the linear ARDL formulation of Pesaran, Shin and Smith (2001). Following the works of Schoderet(2003), Shin, Yu and Greenwood (2014) and Huang and Lin (2009), the non-linear long run equation is specified as:

$$y_{it} = \alpha^{+} x_{it}^{+} + \alpha^{-} x_{it}^{-} + \varepsilon_{it} \qquad 6.3$$

Where x_{it} is a k x 1vector of regressors. Given that x_{it} is defined to be a random walk, such that:

$$x_{it} = x_{(it-1)} + e_{it}, \quad e_{it} \sim \mathrm{N}(0, \delta_e^2) \qquad 6.4$$

When equation (5.1) is linked to the symmetric ARDL of Pesaran Shin and Smith (2001), the following non-linear variant of the unrestricted ECM is obtained;

$$\Delta PRFT_{it} = \alpha + \rho PRFT_{it-1} + w_2^{+} x_{it-1}^{+} + w_2^{-} x_{it-1}^{-} + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} \lambda_i^{+} \Delta x_{it-1}^{+} + \sum_{i=0}^{q-1} \lambda_i^{-} \Delta x_{it-i}^{-} + \varepsilon_{it} \qquad 6.5$$

Where $w_2^{+} = -\rho\alpha^{+}$ and $w_2^{-} = -\rho\alpha^{-}$ and θ_i is the autoregressive parameter λ_i^{+} and λ_i^{-} are the symmetric distributed lag parameters; ε_t is the stochastic error term that is independently and identically distributed with zero mean and constant variance. Hence equation 6.5 could be rewritten thus:

$$\Delta PRFT_{it} = \alpha + \rho PRFT_{it-1} + w_2^{+} x_{it-1}^{+} + w_2^{-} x_{it-1}^{-} + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} \lambda_i^{+} \Delta x_{it-1}^{+} + \sum_{i=0}^{q-1} (\lambda_i^{-} \Delta x_{it-i}^{-}) + \varepsilon_{it} \qquad 6.6$$

The restricted ECM could be written thus:

$$\Delta PRFT_{it} = K_1 ecm_{it} + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} (\lambda_i^{-} \Delta x_{it-i}^{-}) + \varepsilon_{it} \qquad 6.7$$

The rationale for testing for asymmetric cointegration is based on the general form of non-linear ARDL model:

$$PRFT_{it-1} + w_2^+ CAP_{it-1}^+ + w_2^- CAP_{it-1}^- + w_2^+ GDP_{it-1}^+ + w_2^- GDP_{it-1}^- + w_2^+ INTR_{it-1}^+ + w_2^- INTR_{it-1}^- + w_2^+ INFR_{it-1}^+ + w_2^- INFR_{it-1}^- + w_2^+ FID_{it-1}^+ + w_2^- FID_{it-1}^- + \sum_{i=1}^{\rho-1} \lambda_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} (\lambda_i^+ \Delta CAP_{it-i}^+ + \lambda_i^- \Delta CAP_{it-i}^- + \lambda_i^+ \Delta GDP_{it-i}^+ + \lambda_i^- \Delta GDP_{it-i}^- + \lambda_i^+ \Delta INTR_{it-i}^+ + \lambda_i^- \Delta INTR_{it-i}^- + \lambda_i^+ \Delta INFR_{it-i}^+ + \lambda_i^- \Delta INF_{it-i}^- + \lambda_i^+ \Delta FID_{it-i}^+ + \lambda_i^- \Delta FID_{it-i}^-) + \varepsilon_{it} \quad 6.8$$

Where $PRFT_{it}$ = profit of the five banks, CAP_{it}= capital base of the banks, GDP_{it}=real income national level, $INTR_{it}$=Interest rate (lending rate), $INFR_{it}$= price level and FID_{it}= financial deepening (MSS/GDP).

In like manner, CAP_{it-i}^+, CAP_{it-i}^-; $GDP_{it-i}^+, GDP_{it-i}^-; \mathrm{INTR}_{it-i}^+, \mathrm{INTR}_{it-i}^-; \mathrm{FID}_{it-i}^+, \mathrm{FID}_{it-i}^-$; are partial sums of positive and negative changes in the specific bank consolidation indicators while p and q present the lag selection order for the dependent and independent (exogenous) variables in distributed lag.

The Asymmetric Cointegration Test: the following null hypothesis of no cointegration which involve the coefficients of the level form of: $PRT_{it,} GDP_{it}^+, GDP_{it}^-; \mathrm{INTR}_{it}^+, \mathrm{INTR}_{it}^-; \mathrm{FID}_{it}^+, \& \mathrm{FID}_{it}^-$ were tested using Pesaran et al. (2001), and Atil et al (2014) procedure.

$$H_0 = p = w_2^+ = w_2^- = 0 \quad 6.9$$

The decision rule follows that: if the empirical value of the F-statistics exceeds the upper bound critical value at 5 percent level of significance, it provides evidence on the existence of long run relationship between the variables but if the computed value is below the lower bound, it means there is no cointegration. The test is considered inconclusive if the calculated F-statistics lies between the two bounds. If the above hypothesis is rejected, then an error correction model must be formulated to account for the short run and long run relationships simultaneously.

The Wald test was used to test for both short run and long run symmetry. A non-rejection of the hypotheses of short run and long run symmetric effects means that the original symmetric ARDL formulation of Pesaran et al. (2001) will hold.

We started the analysis by examining the unit roots characteristics of the variables under consideration. The essence of this test is to ensure the data conformed to the basic assumption of OLS (constant mean and variance). The test was carried out using the Philip-Peron procedure. The result of the test for the 5 banks' model is reported below:

4. Results

Table 1. Unit root Test Result for Zenith and FCMB Banks

Zenith Bank Unit Roots Test- Philip-Peron procedure					**FCMB Unit Roots Test - Philip-Peron procedure**			
Variable	**PP Statistic**	**1%**	**5%**	**Remark**	**PP Statistic**	**1%**	**5%**	**Remark**
PRFT	-9.499980	-3.596616	-2.933158	i(1)	-4.379229	-3.592462	-2.931404	i(0)
CAP	-6.119054	-3.596616	-2.933158	i(1)	-9.652976	-3.596616	-2.933158	i(1)
GDP	-6.331670	-3.596616	-2.933158	i(1)	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)	-6.357971	-3.596616	-2.933158	i(1)

Table 2. Unit root Test Result for Diamond and ECO Banks

Diamond Bank Unit Roots Test- Philip-Peron procedure					**ECO Bank Unit Roots Test- Philip-Peron procedure**			
Variable	**PP Statistic**	**1%**	**5%**	**Remark**	**PP Statistic**	**1%**	**5%**	**Remark**
PRFT	-4.810029	-3.592462	-2.931404	i(0)	-5.280265	-3.592462	-2.931404	i(0)
CAP	-6.135989	-3.592462	-2.931404	i(0)	-6.259187	-3.592462	-2.931404	i(0)
GDP	-6.331670	-3.596616	-2.933158	i(1)	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)	-6.357971	-3.596616	-2.933158	i(1)

Table 3. UBA Unit Roots Test – Philip-Peron Procedure

Variable	**PP Statistic**	**1%**	**5%**	**Remark**
PRFT	-4.810574	-3.592462	-2.931404	i(0)
CAP	-6.135953	-3.592462	-2.931404	i(0)

GDP	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)

The unit roots tests conducted for the five banks' models as reported in *tables 1, 2 and 3* indicate that the variables were integrated at different orders {order zero i(0) and order one i(1) } hence the used of NARDL method for the analysis of short and long run relationship between banking sector consolidation and the performance of banks.These results imply that the null hypothesis of non-stationarity for all the variables was rejected. Based on the stability of the variables, we went further to establish whether or not there is a long-run cointegrating relationship amongst the variables by using the NARDL bound test Shin et al. (2014)

Table 4. Short run NARDL Result Zenith Bank Model – Dependent Variable PRFT, Model Selection-order criteria (1, 1, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
$PRFT_{t-1}$	-1.96	-7.11***	0.00
CAP^{+}_{t-1}	0.26	5.84***	0.00
CAP^{-}_{t-1}	0.29	6.29***	0.00
GDP^{+}_{t-1}	-0.002	-0.04	0.97
GDP^{-}_{t-1}	0.14	1.12	0.29
$INTR^{+}_{t-1}$	0.14	0.86	0.41
$INTR^{-}_{t-1}$	0.45	0.48	0.64
$INFR^{+}_{t-1}$	1.09	1.26	0.24
$INFR^{-}_{t-1}$	-0.79	-5.74***	0.00
FID^{+}_{t-1}	-0.51	-0.47	0.65
FID^{-}_{t-1}	0.17	0.13	0.90
$\Delta PRFT_{t-1}$	0.31	2.33**	0.04
ΔCAP^{+}	0.18	17.35***	0.00
ΔCAP^{+}_{t-1}	0.01	0.61	0.55
ΔCAP^{-}	0.14	15.48	0.00
ΔCAP^{-}_{t-1}	-0.05	-2.48	0.04
ΔGDP^{+}	-0.001	-0.16	0.88
ΔGDP^{+}_{t-1}	0.001	0.35	0.73
ΔGDP^{-}	0.001	0.04	0.97
ΔGDP^{-}_{t-1}	0.007	0.48	0.64
$\Delta INTR^{+}$	-0.02	-0.12	0.91
$\Delta INTR^{+}_{t-1}$	0.15	0.59	0.57
$\Delta INTR^{-}$	0.79	1.75	0.11
$\Delta INTR^{-}_{t-1}$	-0.77	-2.04	0.07
$\Delta INFR^{+}$	0.95	0.90	0.39
$\Delta INFR^{+}_{t-1}$	0.25	1.73	0.12
$\Delta INFR^{-}$	-1.62	-5.65***	0.00
$\Delta INFR^{-}_{t-1}$	0.48	2.01	0.08
ΔFID^{+}	-0.05	-0.69	0.51
ΔFID^{+}_{t-1}	0.03	0.41	0.69

ΔFID^{-}	-0.002	-0.02	0.99
ΔFID^{-}_{t-1}	0.04	0.35	0.73
Cons	13.97	2.64**	0.03

Table 5. Long-run Effect Result - Zenith Bank model

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.134	350.7***	0.00	-0.15	795.7***	0.00
Gdp	-0.000	0.002	0.97	-0.01	1.17	0.31
Intr	0.071	0.708	0.42	-0.23	-0.23	0.64
Infr	0.556	1.498	0.25	0.41	20.94***	0.00
Fid	-0.026	0.218	0.65	-0.01	0.018	0.89

Table 6. Long –run, Short-run asymmetry and Cointegration Test Results – Zenith Bank Model

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for Zenith Bank Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	7.04***	0.03	12.43***	0.001	-7.1056	29.6975
Gdp	0.22	0.29	0.08	0.78		
Intr	0.10	0.76	0.14	0.71		
Infr	3.45	0.09	2.84	0.13		
Fid	3.09	0.11	0.05	0.83		

Table 7. Model Diagnostic Test for Zenith Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	12.09	0.88	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.24	0.62	Accept H_0
Ramsey RESET test (F)	3.53	0.09	Accept H_0
Jarque-Bera test on normality (chi2)	1.30	0.52	Accept H_0

Table 8. Short run NARDL Result FCMB Model – Dependent Variable PRT, Model Selection-order criteria (1, 2, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-0.86	-0.74	0.49
CAP^{+}_{t-1}	-0.53	-0.95	0.39
CAP^{-}_{t-1}	0.46	0.05	0.96
GDP^{+}_{t-1}	0.12	2.02	0.09
GDP^{-}_{t-1}	-0.02	-0.05	0.96
$INTR^{+}_{t-1}$	-3.69	-0.77	0.48
$INTR^{-}_{t-1}$	5.80	0.98	0.37
INF^{+}_{t-1}	4.52	0.80	0.46
INF^{-}_{t-1}	-2.57	-0.48	0.65

FID^{+}_{t-1}	3.15	2.42	0.06
FID^{-}_{t-1}	3.54	2.40	0.06
ΔPRT_{t-1}	-0.77	-2.03	0.09
ΔCAP^{+}	-0.42	-1.02	0.35
ΔCAP^{+}_{t-1}	1.59	2.44	0.06
ΔCAP^{-}	1.50	2.65	0.05
ΔCAP^{-}_{t-1}	-0.18	-1.36	0.23
ΔGDP^{+}	0.15	2.55	0.05
ΔGDP^{+}_{t-1}	-0.29	-0.75	0.49
ΔGDP^{-}	-0.19	-0.83	0.45
ΔGDP^{-}_{t-1}	-0.60	-2.92	0.03
$\Delta INTR^{+}$	-3.26	-0.95	0.39
$\Delta INTR^{+}_{t-1}$	-7.40	2.34	0.07
$\Delta INTR^{-}$	-3.64	-0.96	0.38
$\Delta INTR^{-}_{t-1}$	10.59	1.67	0.16
ΔINF^{+}	6.81	0.95	0.39
ΔINF^{+}_{t-1}	8.80	2.64	0.05
ΔINF^{-}	1.93	0.86	0.43
ΔINF^{-}_{t-1}	-4.17	-0.93	0.39
ΔFID^{+}	-0.50	-0.60	0.58
ΔFID^{+}_{t-1}	-4.05	-3.38	0.02
ΔFID^{-}	4.10	2.84	0.04
ΔFID^{-}_{t-1}	-0.32	-0.29	0.78
Cons	-6.61	-0.27	0.80

Table 9. Long run Relationship/Effects – FCMB Model

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	-0.613	0.188	0.683	-0.053	0.003	0.960
Gdp	0.139	0.402	0.554	0.018	0.003	0.961
Intr	-4.278	0.553	0.491	-6.728	0.602	0.473
Inf	5.241	0.228	0.653	2.981	0.110	0.753
Fid	3.653	0.421	0.545	-4.104	0.428	0.542

Table 10. Long –run, Short-run asymmetry and Cointegration Test Results – FCMB Model

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	0.176	0.692	0.028	0.874	-0.7398	4.8281
Gdp	0.227	0.654	6.188	0.055**		
Intr	1.094	0.343	3.540	0.119		
Inf	0.184	0.656	3.303	0.129		
Fid	0.261	0.631	6.914	0.047**		

Table 11. Model Diagnostic Test for FCMB Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	29.11	0.06	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.53	0.47	Accept H_0
Ramsey RESET test (F)	10.27	0.09	Accept H_0
Jarque-Bera test on normality (chi2)	0.22	0.89	Accept H_0

Table 12. Short run NARDL Result Diamond Bank Model – Dependent Variable PRFT Selection – order criteria (0, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-4.89	-2.73	0.04
CAP^{+}_{t-1}	-0.44	-2.19	0.08
CAP^{-}_{t-1}	-0.80	-0.48	0.65
GDP^{+}_{t-1}	0.32	1.47	0.20
GDP^{-}_{t-1}	0.19	0.27	0.80
$INTR^{+}_{t-1}$	0.50	-0.06	0.96
$INTR^{-}_{t-1}$	-14.38	-0.94	0.39
$INFR^{+}_{t-1}$	-18.89	-1.22	0.28
$INFR^{-}_{t-1}$	1.94	0.75	0.49
FID^{+}_{t-1}	1.40	0.50	0.64
FID^{-}_{t-1}	-0.14	-0.05	0.96
ΔPRT_{t-1}	2.54	2.11	0.09
ΔCAP^{+}	0.04	1.74	0.14
ΔCAP^{+}_{t-1}	0.42	2.45	0.06
ΔCAP^{-}	-0.03	-0.27	0.80
ΔCAP^{-}_{t-1}	0.13	1.47	0.20
ΔGDP^{+}	0.48	1.45	0.21
ΔGDP^{+}_{t-1}	-0.04	-0.52	0.63
ΔGDP^{-}	-0.48	-1.24	0.27
ΔGDP^{-}_{t-1}	-0.91	-1.22	0.28
$\Delta INTR^{+}$	-3.98	-0.69	0.52
$\Delta INTR^{+}_{t-1}$	-9.60	-1.05	0.34
$\Delta INTR^{-}$	-4.12	-0.67	0.54
$\Delta INTR^{-}_{t-1}$	6.92	1.02	0.35
ΔINF^{+}	-12.93	-0.64	0.55
ΔINF^{+}_{t-1}	11.07	1.30	0.25
ΔINF^{-}	-0.11	-0.04	0.97
ΔINF^{-}_{t-1}	-1.56	-0.52	0.63
ΔFID^{+}	-0.81	-0.64	0.55
ΔFID^{+}_{t-1}	-2.83	-1.26	0.27
ΔFID^{-}	0.52	0.17	0.88
ΔFID^{-}_{t-1}	-0.74	-0.33	0.76
Cons	73.99	1.45	0.21

Table 13. Long run effects result of Profit model of Diamond Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability

Cap	-0.09	3.30	0.13	0.02	0.18	0.69
Gdp	0.07	4.96	0.08	-0.04	0.08	0.79
Intr	-0.10	0.003	0.96	2.94	0.83	0.41
Inf	-3.86	1.65	0.26	-0.40	0.75	0.43
Fid	0.29	0.34	0.59	0.03	0.002	0.96

Table 14. Long and Short runs asymmetry Result of Diamond Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	2.99	0.14	3.01	0.14	-2.7258	2.9609
Gdp	0.04	0.85	2.29	0.19		
Intr	0.38	0.57	2.68	0.16		
Inf	1.68	0.25	0.00	0.99		
Fid	0.62	0.47	0.67	0.15		

Table 15. Model Diagnostic Test for Diamond Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	39.14	0.003	Reject H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.48	0.49	Accept H_0
Ramsey RESET test (F)	32.28	0.06	Accept H_0
Jarque-Bera test on normality (chi2)	3.69	0.16	Accept H_0

Table 16. Short run NARDL Result ECO Bank Model – Dependent Variable PRT Selection – order criteria (4, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	1.78	1.65	0.16
CAP^{+}_{t-1}	-0.01	-0.06	0.95
CAP^{-}_{t-1}	-0.12	-0.07	0.95
GDP^{+}_{t-1}	0.02	0.24	0.82
GDP^{-}_{t-1}	0.36	0.75	0.49
$INTR^{+}_{t-1}$	3.20	0.39	0.72
$INTR^{-}_{t-1}$	5.74	0.95	0.38
INF^{+}_{t-1}	0.95	0.13	0.91
INF^{-}_{t-1}	-0.41	-0.20	0.85
FID^{+}_{t-1}	1.89	1.29	0.25
FID^{-}_{t-1}	0.71	0.29	0.78
ΔPRT_{t-1}	-3.20	-3.58	0.02
ΔCAP^{+}	-0.20	-1.48	0.19
ΔCAP^{+}_{t-1}	0.01	0.07	0.94
ΔCAP^{-}	0.02	0.40	0.70
ΔCAP^{-}_{t-1}	0.03	2.97	0.03
ΔGDP^{+}	-0.07	-0.78	0.47
ΔGDP^{+}_{t-1}	-0.01	-0.09	0.93
ΔGDP^{-}	0.97	2.33	0.07

ΔGDP^{-}_{t-1}	0.34	0.60	0.57
$\Delta INTR^{+}$	9.95	2.28	0.07
$\Delta INTR^{+}_{t-1}$	2.69	0.37	0.73
$\Delta INTR^{-}$	4.87	1.53	0.19
$\Delta INTR^{-}_{t-1}$	1.54	0.52	0.63
ΔINF^{+}	-1.61	-0.15	0.89
ΔINF^{+}_{t-1}	4.89	0.78	0.47
ΔINF^{-}	-1.54	-0.69	0.52
ΔINF^{-}_{t-1}	-1.87	-0.70	0.52
ΔFID^{+}	3.77	2.97	0.03
ΔFID^{+}_{t-1}	0.40	0.23	0.83
ΔFID^{-}	-1.44	-0.74	0.49
ΔFID^{-}_{t-1}	-0.60	-0.30	0.78
Cons	-28.47	-0.32	0.45

Table 18. Long run effects result of Profit model of ECO Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.01	0.004	0.955	-0.007	0.004	0.950
Gdp	-0.01	0.050	0.833	0.205	0.559	0.488
Intr	-1.80	0.149	0.716	3.231	1.15	0.333
Inf	-0.54	0.017	0.903	-0.232	0.040	0.849
Fid	-1.07	1.078	0.347	0.402	0.078	0.791

Table 19. Long and Short runs asymmetry Result of ECO Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	0.014	0.911	0.1107	0.753	1.6512	5.1111
Gdp	0.402	0.554	2.042	0.212		
Intr	0.055	0.824	0.697	0.442		
Inf	0.023	0.885	0.485	0.517		
Fid	0.546	0.493	4.025	0.101		

Table 20. Model Diagnostic Test for ECO Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	31.61	0.003	Reject H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.50	0.48	Accept H_0
Ramsey RESET test (F)	2.95	0.26	Accept H_0
Jarque-Bera test on normality (chi2)	0.48	0.79	Accept H_0

Table 21. Short run NARDL Result UBA Bank Model – Dependent Variable PRT Selection – order criteria (1, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-1.40	-1.73	0.14
CAP^{+}_{t-1}	0.01	0.62	0.57
CAP^{-}_{t-1}	0.04	1.35	0.23
GDP^{+}_{t-1}	-27.16	-0.21	0.84
GDP^{-}_{t-1}	549.83	1.03	0.35
$INTR^{+}_{t-1}$	6664.9	0.82	0.45
$INTR^{-}_{t-1}$	38350.5	2.84	0.04
INF^{+}_{t-1}	40784.5	3.37	0.02
INF^{-}_{t-1}	-6822.4	-3.00	0.03
FID^{+}_{t-1}	576.87	0.17	0.87
FID^{-}_{t-1}	-716.65	-0.22	0.84
ΔPRT_{t-1}	0.061	0.11	0.92
ΔCAP^{+}	-0.003	-0.26	0.80
ΔCAP^{+}_{t-1}	-0.016	-0.94	0.39
ΔCAP^{-}	0.024	1.36	0.23
ΔCAP^{-}_{t-1}	0.016	1.42	0.22
ΔGDP^{+}	-53.51	-0.44	0.67
ΔGDP^{+}_{t-1}	-46.63	-0.58	0.58
ΔGDP^{-}	430.64	0.94	0.39
ΔGDP^{-}_{t-1}	406.38	0.76	0.48
$\Delta INTR^{+}$	3448.5	0.48	0.65
$\Delta INTR^{+}_{t-1}$	4448.1	0.54	0.61
$\Delta INTR^{-}$	17757.47	3.68	0.01
$\Delta INTR^{-}_{t-1}$	-13555.85	-1.86	0.12
ΔINF^{+}	55909.27	3.67	0.14
ΔINF^{+}_{t-1}	-11434.3	-1.69	0.15
ΔINF^{-}	-1940.36	-0.53	0.62
ΔINF^{-}_{t-1}	5412.62	1.27	0.26
ΔFID^{+}	479.30	0.39	0.72
ΔFID^{+}_{t-1}	1618.48	0.69	0.52
ΔFID^{-}	-862.79	0.30	0.78
ΔFID^{-}_{t-1}	-738.74	-0.31	0.77
Cons	-122944	-2.83	0.04

Table 22. Long run effects result of Profit model of UBA Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.009	0.401	0.56	-0.029	2.47	0.18
Gdp	-19.39	0.038	0.85	-392.56	0.78	0.42
Intr	4758.53	0.459	0.53	-27380.9	4.80	0.08
Inf	29118.7	3.01	0.14	4870.9	1.91	0.23
Fid	411.86	0.034	0.86	511.67	0.04	0.85

Table 23. Long and Short runs asymmetry Result of ECO Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	4.44	0.089	3.048	0.141	-1.7286	4.4505
Gdp	0.68	0.445	1.368	0.295		
Intr	3.72	0.112	0.1367	0.727		
Inf	2.89	0.150	8.221	0.035		
Fid	0.61	0.471	0.545	0.494		

Table 24. Model Diagnostic Test for ECO Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	15.91	0.53	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.13	0.72	Accept H_0
Ramsey RESET test (F)	1.81	0.38	Accept H_0
Jarque-Bera test on normality (chi2)	1.62	0.44	Accept H_0

5. Discussion of Findings

The NARDL result for Zenith bank shows that capital base impacted positively and significantly on the bank's performance. This implies that shocks in capital base was crucial in explaining performance of Zenith bank over the period. The NARDL result also indicates that capital base has positive but insignificant shocks on the performance of ECO, and UBA banks. This implies that increases in capital base these banks spurred their performance and vice versa hence conformed with theoretical expectation. However, the NARDL shows that shock in capital base negatively and insignificantly affected performance of Diamond and FCMB banks both in the long and short run. This implies that increase in capital base of Diamond and FCMB banks retarded their performance. The results of Zenith, Eco and UBA banks are in consonance with the earlier studies by Alexiou and Sofoklis (2009), Angbazo (1997), Athanasoglou et al. (2008), Berger (1995b), Bourke (1989), García-Herrero et al. (2009), Iannotta et al. (2007) and Lloyd-Williams et al. (1994). The results from FCMB and Diamond banks are not in tandem with theoretical expectation but allied with findings from studies by Haron (2004) and Salim & Yadav (2012). Zenith, Eco and UBA banks have experienced relative stability because of their size and spread not only in Nigeria but also in the continent of Africa. FCMB, Diamond are relatively new and have undergone series of

transformation due to merger and acquisition. The foregoing analysis implies that the profitability/performance of a bank is supported by a strong capital base.

Myriads of empirical evidences reveal that the instability and systemic crisis that characterised the banking sector in Nigeria was mainly attributed to inadequacy or weak capital base, culminating in the banking consolidation exercise in the nation's banking history. For instance, Zenith, Eco and UBA Banks have experienced relative stability in terms of capital base, spread (branch networks) and management over the years. These banks were also very effective in acquiring other banks in order to enlarge their own scope (Eco acquired Oceanic Bank in 2008). These developments may have influenced the significant results obtained from these banks. On the other hand, FCMB and Diamond Banks are relatively new in the financial/banking sector and have also undergone several internal reforms and restructuring over the years, due to low capital base and poor management (see Sanusi 2011). This development may have informed the insignificant results that we arrived at via this study. The foregoing analyses are in tandem with the theoretical and empirical findings by Kanu and Isu (2013), Berger (1995) and Hughes and Mester (1997). In their studies, they have concluded that improvement in the capital base and profitability is positively and directly related to the performance of banks in Nigeria.

In addition, applying the quarterly returns and using the NARDL method for the five sample banks from the 18 financial institutions selected for the research study, the analysis for Zenith Bank shows that there exists a unique short and long-run asymmetry between profitability level and consolidation (capital base). This implies that the variable tends to move together in the long run, according to the economic theory in the literature of this work. For instance, Guru et al, (2002) found that a bank's profit decreases as the interest rate increases. They also discovered that a high price level increases the performance of banks in Malaysia. Ogowewo and Uche (2006), however, found that high inflation constrained banks performance. Tan and Floros (2012) found that an increase in GDP was inversely related to banks' profit level in China. On his path, Ting (2012) found a direct and significant link between financial development and a bank's profitability. Though the finding of Ting (2012) was not in tandem with our result in this study, the other results, by Guru et al. (2002) and Ogowewo and Uche (2006), support our findings in this study. The coefficient of determination in the analysis for Zenith Bank indicated that 99% of the total variation in profitability/performance was determined by changes in capital base, GDP, inflation, financial deepening and interest rates

during the period under review. Also, Eco bank, UBA, Diamond and FCMB revealed coefficients of determination of: 94%, 84%, 57% and 78% respectively. These high coefficients of determination further corroborated the crucial roles played by the variables in explaining performance and pointed out the fact that the profitability of the banking sector in Nigeria is determined by internal and external variables, as demonstrated in the literature of this study.

However, the NARDL result for Zenith Bank, indicated that positive shocks in real GDP was positively but insignificantly linked to the bank's performance, both in the short and long run effect. The positive shock in real GDP in the FCMB's model also led to a positive but insignificant effect on profitability. A consistent result (sign) of positive and insignificant impact of positive shock was also evident in the Diamond and Eco Banks' models for the real GDP. The UBA and Eco bank's models were, however, found to have negative effect of positive shock in real GDP both in the long run and short run. Though real GDP was found to have an insignificant asymmetry in all the five models, the mixed effects of this variable showed that real income had diverse impacts on the performance of banks in Nigeria. Evidences in literature also show these mixed implications, for instance, Schumpeter (1934); Goldsmith (1969); Mckinnon (1973); Shaw (1973); Ndege (2012) and Levine (2004) have all provided empirical evidence of positive links between real GDP and performance of banks. However, the findings in the study carried out by Tan and Floros (2012) pertaining to the Chinese banking sector reveals that GDP and performance are inversely related.

The NARDL result for Zenith Bank model was mixed. In this case, positive and negative shocks in inflation was found to be positively but insignificantly affected Zenith Bank's performance. The result was also same for FCMB's and UBA's models, with positive and negative shocks in price level translating to positive effect on profitability of the bank both in the long and short runs. The result of the NARDL for Diamond Bank showed that shocks (positive and negative) in inflation rate had a negative and insignificant effect on profitability of the bank both in the short and long runs. The result for Eco banks shows that both negative and positive shocks in price level have negative effect on performance of the banks in the short and long run effects. This negative relationship between inflation and profitability is supported in the literature by CBN 1994; Afolabi and Oluyemi (1995); Uche (2006) and Ogowewo and Uche (2006). Their conclusions were theoretical in nature, and are now supported by our empirical results. They observed that the high price level in the Nigerian

economy reduces demand for banks' financial assets, leading to a situation of diversion of deposit to other sectors of the economy, such as real estate, and further preventing the banking sector from performing its role as a financial intermediator.

The result of our analysis using the NARDL indicated that shocks in financial development have negative effect and insignificant implication on the performance of Zenith Bank's model. The result of the NARDL model for FCMB was, however indicated that positive shock in financial development had positive and insignificant effect on long run and short performance of FCMB while the negative shock retarded the performance of the bank. For the Diamond Bank's model, shocks in financial deepening was found to have positive and insignificant impact on the bank's performance in the long run while in the short run, shocks in financial development had both positive and negative effects on the performance of the bank. Positive shock in financial deepening had a negative effect on the performance of Eco bank while a negative shock had positive effect on its performance in the long run. In the short run, shocks in financial development led to positive effect in performance of Eco bank except at lag 1. In the UBA model, positive and negative shocks in financial deepening have positive but insignificant effect on the performance of the bank in the long run while in the short run, positive shock has positive effect on performance while negative shock has negative and insignificant effect on the bank's performance during the period of this study. Most of the works reviewed in the literature appeared to conformed with our results that showed a positive relationship between financial deepening and bank performance. For instance, the studies by King and Levine (1993); Khan and Senhadji (2000) and Ting (2012) in the literature, revealed a direct relationship between financial deepening and profitability/performance.

NARDL result for interest rate shows that it has positive effect on the performance of Zenith bank while a negative shock in interest retarded its performance in the long run. In the short run, shocks in interest rate have positive effect on zenith bank's performance. The positive effect of shock in interest rate on performance is in agreement with the results of the works of Bourke (1989), Claeys and Vander Vennet (2008), DemirguçKunt and Huizinga (1999), García-Herrero et al. (2009), Molyneux and Thornton (1992), and Staikouras and Wood (2003). In Eco Bank's model, the positive shock in interest rate has negative effect on performance of the bank while a negative shock has positive effect on Eco's bank performance but insignificantly in the long run. However, in the short run, both positive and

negative shocks have positive impact on the performance of the bank. The result of the NARDL method for UBA, indicated a positive effect of positive shock in interest result and a negative effect of negative shock in the bank's performance in the long run. However, in the short run, shocks in interest rate led to positive effect on profitability of UBA. For Diamond bank, positive shock in interest rate has negative effect on performance while negative short stimulated the bank's performance in the long run but in the short shocks in interest rate stimulated the performance of Diamond bank. The FCMB's model shows that shocks in interest rate have negative effect in performance of the bank in the long run. In the short run, positive shock in interest rate led to negative effect while negative shock in interest rate led to positive effect on FCMB's performance over the period of the study. Though Trujillo-Ponce (2010) argued that a stable macroeconomic and financial environment of low interest rates coupled with tense competition among banks could reduce the possibilities for banks to establish appropriate prices for their loans and deposits, thereby putting pressure on the cost of operation and negatively affecting banks' profitability. This shows that Interest rate has serious implication on volume of liquidity banks give out as loan. However, most of the works reviewed indicate evidence of positive nexus between interest rate and profitability of banks (see; Bourke (1989), Claeys and Vander Vennet (2008), DemirguçKunt and Huizinga (1999), García-Herrero et al. (2009), Molyneux and Thornton (1992), and Staikouras and Wood (2003). Higher lending rates tend to spur profitability in the short run as banks can earn higher income at higher lending rates. However, it is difficult for banks to sustain gains using such a step as it could drive away customers and investors.

The results of the five bank's models, analysed using the NARDL, indicated that the five models adjusted speedily to long-run dynamics given the significance of the NARDL bound test statistic for all the five bank's models. This implies that capitalisation had long-run implications on the performance of DMBs in Nigeria over the period under investigation. however, both short run and long asymmetry was absent in all the variables and models except for capital base in the Zenith bank's model which shows evidence of both short and long run asymmetry.

The high coefficient of determination in all the five banks' models investigated, Zenith bank 99%, Eco bank 94%, UBA 81%, FCMB 78% and Diamond bank 57% also revealed the collective strong implication of consolidation on the performance of banks in Nigeria over the period of this study. The import of the foregoing result and analysis is that

profitability/performance was explained significantly by variation in capital base, financial deepening, GDP, interest rates and inflation in Nigeria over the period.

6. Concluding Remarks

Based on the above findings, the study concludes that: The capital base of DMBs in Nigeria had serious implications on profitability of the banking sector but such impact differs among the banks over the period of this study. Financial development (financial deepening) contribution to the performance of the banking sector in Nigeria was marginal at the sectoral level but differs across individual banks over the period of this investigation. In addition, increase in the national income contributed less to the profitability of DMBs at the sectoral level but its impact on individual banks differs during the period of this study. Furthermore, the cost of credit had less impact on the profitability of DMBs both at the sectoral level and individual bank's over the period of this study. Capital base was crucial in enhancing/promoting the performance of banks that went through the consolidation process without merging or acquiring others. e.g Zenith Bank. Capital base had higher propensity for increasing the performance of DMBs in Nigeria over the period of this investigation. Positive shock in inflation rate had mixed but insignificant effect on the performance of the banking sector, meaning that increases in the price level in the short-run spurred investments and production activities during the period of study. Banking sector consolidation is crucial for the growth and development of any economy. The study shows that collapse of the banking sector also leads to the collapse of an economy, with the implication that the banking sector is an integral part of the overall economy of any nation. The banking sector performs better and more efficient in an oligopolistic environment. This position is true in the Nigeria experience and also akin to other banking jurisdictions including West Africa, USA, Asia and UK. Finally, this investigation showed that Unity Bank Plc and UBA performed better with improved capital base than other banks, while Union and Heritage Banks performed abysmally with higher capital base during deregulation than during regulation in Nigeria.

References

Adegbaju, A. A., and Olokoyo, F.O. (2008) Recapitalization and banks' performance: A case of Nigeria banks.*African Economic and Business Review* [Internet], 6(1), pp.84–98, http://eprints.covenant University.edu.ng, Accessed 1 August 2015.

Afolabi, J.A., and Oluyemi, S. A. (1995) An assessment of the impact of inflation on financial intermediation in Nigerian banking sector. NDIC Quarterly Journal, 5(1), pp. 29–48.

Angbazo, L. (1997) Commercial bank net interest margins, default risk, interest rate risk and off-balance sheet banking. *Journal of Banking and Finance,* 21, pp.55–87.

Athanasoglou, P. P., Brissimis, S. N., and Delis, M. D. (2008). Bank -specific, industry - specific and macroeconomic determinants of bank profitability: International Financial Markets Institutions & Money, 18 (2008), pp.121- 136.

Albertazzi, U., and Gambacorta, L. (2009). Bank profitability and the business cycle. *Journal of Financial Stability,* 5, pp.393-409.

Alexiou, C., and Sofoklis, V. (2009). Determinants of Bank Profitability: Evidence from the Greek Banking Sector. *Economic Annals, LIV No*. 182, pp.93-118.

Ayodele, O. (1988) In: Ezike, J. E., and Oke M. O. (2013) Capital adequacy standards, bagsle accord and bank performance: the Nigerian experience (A case study of selected banks in Nigeria). *Asian Economic and Financial Review*. Vol. 3, No. 2, p. 149.

Claeys, S., Vander Vennet, R., (2008). Determinants of bank interest margins in Central and Eastern Europe: A comparison with the West. *Economic Systems,* Vol. 32, pp.197–216.

Demirgüç-Kunt, A., and Huizinga, H. (1999) Determinants of commercial bank interest margins and profitability: Some international evidence. *World Bank Economic Review* [Internet]. 13(2), pp. 379–408, http://elibrary .worldbank.org, Accessed 20 September 2015.

Dietrich, A., and Wanzenried, G., (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*.

García-Herrero, A., Gavilá, S., and Santabárbara, D., (2009). What explains the low profitability of Chinese banks? *Journal of Banking andFinance,* Vol. 33, pp. 2080-2092.

Iannotta, G.; Nocera, G., and Sironi, A., (2007). Ownership structure, risk and performance in the European banking industry. *Journal of Banking and Finance* Vol. 31, pp. 2127–2149.

Imala, O. I. (2005) Challenges of banking reforms and bank consolidation in Nigeria.*CBN Bullion*, 29(2), pp. 25–26.

Imala, O.I. (2005) In: 'Central Bank of Nigeria' 2005, Banking sector reforms and bank consolidation in Nigeria. *Central Bank Bullion*, Vol. 28, No. 2, pp. 25-36.

Kasman, A., Tunc, G., Vardar, G., and Okan, B. (2010) Consolidation and commercial bank net interest margins: Evidence from the old and new European Union members and candidate countries. *Economic Modelling,* Vol. 27, pp. 648–655.

King A Salami (Ph.D) (2015). Impact of Mergers and Acquisition (MA) on Performance of Ghana's Banking Industry. *Standard Research Journal of Business Management.* ISSN: 2310-7537) Vol. 3(4): pp. 073, September, 2015.

Kosmidou, K. (2008). The determinants of bank's profits in Greece during the period of EU financial integration. *Managerial Finance*, Vol. 34 Issue 3, pp.146 -159.

Lemo, T. (2005) Regulatory oversight and stakeholder protection. *Paper presented at the BGL Mergers and Acquisitions Interactive Seminar*, Eko Hotels & Suits Victoria Island, 1 June 24.

Lloyd-Williams, D. M., Molyneux, P., and Thornton, J. (1994) Market structure and performance in Spanish banking. *Journal of Banking andFinance* Vol. 18, pp. 433-443.

Mason, E.S. (1939), 'Price and Production Policies of Large-Scale Enterprise; *American Economic Review*, Vol. 29, pp. 61-74.

Molyneux, P., and Thornton, J. (1992) Determinants of European bank profitability: As note. *Journal of Banking and Finance* [Internet], 16, pp.1173–1178,

Mustapha, B., and Wakeel, A.I. (2014) Empirical analysis of structure-conduct-performance paradigm on Nigerian banking industry. *The Empirical Econometrics and Quantitative Economics Letters*, Vol.3, No.3, pp. 24–34.

Nabieu, G.A.A (2013) The Structure, conduct and performance of commercial banks in Ghana. *European Journal of Business and Innovation Research*, Vol. 1, No. 4, p. 36.

Nnanna, O.J. (2005) In: Sani, J. and Alani, G.O. A comparative analysis of pre and post re-capitalization finance performance of banks in Nigeria. *Journal of Capacity Building in Education and Management (IJCBEM)*, 2 (1), pp. 79–80.

Oghojafor, B.E.A. (2012) Evaluating M&Aas an intervention strategic in the Nigerian banking sector: The good, bad and the ugly. *International Business Research*, 5(5) May, pp. 149–154.

Oghojafor, B.E.A. (2012) Evaluation mergers and acquisition as strategic intervention in the Nigerian banking sector: the good, bad and the ugly. *International Business Research,* http://www.ccsenet.org/ibr, Accessed on 18 May 2007.

Ogowewo and Uche, C. (2006) Misusing bank share capital as a regulatory tool to force bank consolidations in Nigeria. *Journal of African Law*, 50 (2), pp.161–186.

Ogunleye, E.O (1997) Annual Financial Statement. Central bank of Nigeria Banking supervisory department, Vol. 1, pp. 5-18.

Onoh, J.K. (2002). *Dynamics of money banking and finance in Nigeria: an emerging market*. Astra Meridan Publishers. pp. 34&47

Onoh, J.K. (1982) *Money and banking in Africa.* Nigeria, Abia State University (Uturu). pp. 163–173.

Pasiouras, F., and Kosmidou, K., (2007) Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Researchin International Business and Finance* Vol. 21, pp. 222–237.

Sanusi, L.M. (2010) Global financial meltdown and the reforms in the Nigerian banking sector. *Public Lecture Delivered at the Convocation Square, Abubakar Tafawa Balewa University Bauchi.* pp. 1-28.

Sanusi, L.M. (2010) '50 Years of Central Banking in Nigeria (1958-2008)' (2009), Nigeria: Central Bank of Nigeria, p. 129.

Soludo, C. C. (2004) Consolidating the Nigerian banking industry to meet the development challenges of the 21st century. Address delivered to the Bankers Committee, 43, pp. 1–6.

Staikouras, C., and Wood, G. (2003) The determinants of bank profitability in Europe. In: *European Applied Business Research Conference Proceedings*, Venice.

Ting, H. (2012) Financial development, political connection, and bank profitability: Evidence from the financial crisis of 2008. *Proceedings of the 2012 National Taiwan University International Conference on Finance*