



## **The Impact of Capital, Concentration, Size and Liquidity on Banking Industry Performance in Nigeria**

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### **ABSTRACT**

This paper investigates the impact of bank's consolidation targeted variables (capital adequacy, concentration, bank-size and liquidity) in conjunction with economic growth and inflation on the industry's performance in Nigeria. Data from 1980 to 2010 were used for the assessment, and were sourced from Central Bank of Nigeria (CBN), Nigerian deposit insurance cooperation and Annual Reports of the banks. Vector error correction model was used for the examination. Findings reveal that contrary to the expectation of the consolidation policy, concentration, bank-size and liquidity negatively impacted the industry. It was only capital adequacy that exerted positive impact on the performance. Based on the findings, the consolidation targeted variables as there were should have been relied upon solely as the means of improving the performance of the Nigerian banking industry. Consequently, it is recommended that the regulatory authority; CBN should constantly ensure that banks maintained regulated capital adequacy ratio. The industry should not further be concentrated; banks should be categorized into different sizes and be allowed to choose any category they can efficiently manage depending on their capacity, experience, and mode of operation. The banks should improve on their long term deposits mobilization as a vital source of meeting their liquidity needs and should design financial products that meet the needs of all income groups for more all-inclusive banking and economy that will positively impact the banks.

**Keywords:** Impact, Consolidation Targeted Variables, Bank Performance, Vector Error Correction Model

**JEL Classifications:** G21, G 34, and G38

### **1. INTRODUCTION**

Banks as financial intermediary perform very important roles in an economy. For the banking industry to perform their roles and contribute significantly to economic growth and development, the banks themselves must be stable and operating profitably. Poor performance and subsequent failure of banks has consequential effects not only on their owners and on managers, but on bank's depositors and the wider economy, because of that, banks are continuously monitored and regulated. Banks performance depends on several factors. The factors are combination of endogenous (managerial) variables that are under the control of the banks management while others are exogenous (environmental) that are industry specific and macroeconomic variables that are not under full control of banks' management.

In an effort aimed at repositioning Nigerian banks for better performance, the financial industry apex regulator; Central Bank of

Nigeria (CBN) prompted the consolidation of the industry in 2005. The major targets of the consolidation were increased in capital base, size, concentration and liquidity. 4 years (in 2009) after the consolidation, the banking industry experienced another financial crisis that CBN had to embark on another reform of the industry, and bailed out some troubled banks. Furthermore, several years after the consolidation of the industry, there was no significant improvement in the financial performance of the banks. These have generated concerns about the factors that actually determine banks performance in Nigerian.

There have been studies to investigate the factors that determine banks profitability performance in Nigeria. These include, Uremadu (2012), Babalola (2012), Ani et al. (2012) Olagunju et al. (2012), Oleka (2014), Ajibike and Aremu (2015), and Ajide and Ajileye (2015). However, findings from these studies are mixed and ambiguous. Apart from that, the studies did not controlled for economic growth rate, in spite of the overwhelming evidences

that the economy plays critical role in banking performance. This study is an attempt to bridge the gap that have been created by studying the impact of the variables targeted by the banking industry consolidation of 2005 controlling for economic growth rate and inflation on the performance of the industry.

Findings from the study will widen the understanding of the factors that explain banking performance in Nigeria, and assist key players in the industry to evaluate objectively the appropriateness of the consolidation targeted variables on banks performance and provide basis for future course of actions on banks mandatory minimum capital requirement, concentration, size, and liquidity, in the industry in order to foster a vibrant, value creating, safety and competitive banking industry that will in addition to its improve performance contribute to rapid economic growth in Nigeria. The rest of the paper is structured into four sections. Section two reviews the literature; section three presents the research methodology and data, section four is on results and discussion of findings, and section five; summary, conclusion and recommendations.

## 2. LITERATURE REVIEW

In the literature, the consolidation targeted variables (i.e., capital adequacy, concentration, bank-size and liquidity), economic growth and inflation are among the factors considered as determinants of banking industry performance (BIP). Theoretically, the relationship between these variables and BIP are conflicting, empirical findings are equally mixed and inconsistent. These relationships between the explanatory variables and banks performance are expressed as follows.

### 2.1. Bank-size and Bank's Performance

The size of a bank influences its activities of accessing capital, mobilizing deposit, lending, investing, portfolio diversification, and reputation thus affecting performance (Zhang et al., 2008). The nature of the relationship between bank-size and its performance is however contentious. There are two opposing views on the relationship. According to one of the school of thoughts, there is a positive relationship between bank-size and performance (i.e., larger sized banks perform better than smaller banks). This school of thought contend that larger banks enjoy higher economic of scale and scope hence are able to produce services at a lower cost and efficiently (Kosmidou et al., 2005). Larger banks have the ability to raise capital at a lower cost which can positively affect their profits and performance (Demirgüç-Kunt and Huizinga, 1998). They can exert market power and make abnormal profit (Goddard et al., 2004). They diversify their assets and deposits better hence reducing credit and liquidity risks thus performing better (Hughes and Mester, 2013). Finally, larger banks engage in credit rationing in order to make fewer but bigger quality investment that yield better and improving their performance (Hughes and Mester, 2013). Studies by Flamini et al. (2009), Davydenko (2011), Arif et al. (2013), Aladwan (2015), Rahman et al. (2015), and Regehr and Sengupta (2016) reported a positive impact of bank-size on performance.

On the other hand, the opposing view argues that larger banks do not perform better than smaller banks. According to this view, there

is no economic of scale and scope in banking industry because one, as a bank becomes larger it becomes more complex and difficult to manage and monitor leading to reduce managerial efficiency and increase the probability of failure (Beck et al., 2006; Cetorelli et al., 2007). Secondly, due to bureaucratic process, inflexibility, and agency cost, the expected cost saving is often not achieved (Berger et al., 1987). Thirdly, high market power associated with larger banks increase their risk exposure, their charging of higher interest rate make borrowers to shift towards riskier projects hence increasing the probability of non-performing loans, default risk to the banks and reduction in performance (Boyd and De Nicolo, 2005). Studies by Boyd and Runkle (1993), Naceur (2003), Ramadan et al. (2011), Demirgüç-Kunt and Huizinga (2012) Babalola (2012), and Karray and Chichti (2013) reported a negative impact of bank-size on performance.

### 2.2. Capital and Bank's Performance

Capital plays significant roles in the operations of banks. First and foremost it is capital that is used to register and start the bank before other sources of funding come in. It determines the level of credit supply because by regulation credit supply is tied to the level of capital, and credit supply influences interest rate. Capital is equally needed for growth of a bank. A bank level of capital base enhances banking operation by promoting public confidence in the banking industry and assuring its creditors and depositors of its financial strength (Arua, 2006).

According to Morrison and White (2005), there are two theories that explain the roles play by minimum capital requirement for banks. The first is the moral hazard theory which hypothesises that if banks do not have sufficient equity capital at stake when they take investment decision they can take decisions which are ideal for shareholders but may not be favourable for other stakeholders in the industry. The second theory is the safety net theory which postulates that banks equity capital form a cushion against losses for depositors. Santos (2000) also submits that a well-conceived capital requirement will generally discourage undue risk-taking by the banks. In Vlaar (2000)'s opinion, though inefficient banks feel minimum capital requirement as a burden, it mostly improves their performance. Empirical findings on the impact of capital on banks performance show mostly a positive impact of capital on banks performance. Some of these studies include Berger (1995), Hortlund (2005), Aymen (2013), Lee (2015) and Adesina et al. (2015).

### 2.3. Concentration and Bank's Performance

The relationship between banking industry concentration and banks performance is explained by two conflicting views (concentration- stability hypothesis, and concentration-fragility hypothesis). Concentration- stability hypothesis contends that concentration leads to market power, and the existence of market power makes them to increase their profitability and performance. This is done through reduction in competition and demand for efficiency; hence it increases the ability of banks in a concentrated industry to earn monopoly profits by charging higher lending rate and lowering deposit rates of interest (Boyd and Graham, 1991; Akhavein et al., 1997; Demirgüç-Kunt and Huizinga, 1998). Studies by Jeon and Miller (2002), and Hakimi et al. (2015) found a positive impact.

The second view on the impact of concentration on performance argues that concentration has negative impact on performance. According to this school of thought (concentration-fragility hypothesis), because firms that exercise market power mostly do not innovate, concentration can negatively affect bank's performance. In addition, it is argued that concentration creates moral hazard as banks in the concentrated industry take excessive risks with the belief that because there are big and not many in the industry government will always protect them against failure (Mishkin 1999; Boyd et al., 2006; Berger et al., 2009; Uhde and Heimeshoff, 2008). Studies by Ajide and Ajileye (2015) reported a negative impact of concentration on banks performance.

#### 2.4. Liquidity and Bank's Performance

The nature of the relationships that exist between banks liquidity and performance are however conflicting. According to Carletti and Hartmann (2003) that large liquidity shortage may endanger the stability of the industry, hence reduce the level of performance. Molyneux and Thornton (1992) opine that there is a negative correlation between liquidity, profitability and bank performance. This is because liquid assets held by banks yield low or no returns, but if a bank decide not to hold adequate liquidity when there is liquidity need, illiquidity can make banks to sell their assets below market value or borrow at very high interest rate. While, studies by Ajibike and Aremu (2015) and Bourke (1989) found a positive impact of bank's liquidity on performance, Marozva (2015) and Alshatti (2014) reported a negative impact.

#### 2.5. Economic Growth and Bank's Performance

The rate of economic growth influences BIP because it is the economy that the financial industry serves. According to Robinson (1952) where enterprise leads finance simply follows. Gurley and Shaw (1955) supporting this view contend that if the economy grows at a warranted rate, then the demand for financial services will increase at a specifiable rate. The main argument of this school of thought is that it is when there is increase in economic activities that financial services are greatly demanded to meet the need of economic growth and development. Economic growth on the other hand is influence by the banking industry as the industry plays its key roles of mobilizing, allocating and monitoring resources in building up both the physical and the human capital that propel economic growth and development. This hypothesis contends that a well organised and functioning banking industry is needed for economic growth. This school of thought was championed by Bagehot (1873) and supported by Schumpeter (1912) and Hicks (1969) among others.

#### 2.6. Inflation and Bank's Performance

Theoretically, the level of inflation is said to affect BIP in two conflicting ways. One of the views held that inflation distorts relative prices, discourages long-term planning, reduce savings, discourage lending, and investment hence it increases the risk of doing business (Friedman, 1977). Keynes (1923) argues that because banks are typically net creditors in nominal financial instruments, unanticipated inflation reduces bank's performance as wealth are transfer from banks owners (investors) and depositors (savers) to debtors. This is because in period of inflation, savers will prefer to invest in non- monetary physical assets as against

saving their money with banks. Boyd et al. (2000) corroborates Friedman (1977) and Keynes (1923), but contends that the relationship between inflation and banks performance is non-linear. According to Boyd et al. (2000), as inflation raises its marginal effects on lending activities diminishes rapidly. On the impact of inflation on banks performance, Davydenko (2011), Guru et al. (2002), Flamini et al. (2009), Tan and Floros (2012), and Oleka (2014) reported a positive impact.

To Perry (1992), the effect of inflation on bank's performance depends on whether inflation is anticipated or unanticipated. In his view, if inflation is fully anticipated and interest rate is set bearing that in mind such that it makes revenue to increase faster than costs then it will have positive effect on profitability and performance. However, if inflation is not anticipated and the bank does not adjust interest rate to suit the prevailing situation such that bank costs increase more than their revenue, then inflation will affect profitability and performance negatively. Based on this, the theoretical prediction on the impact of inflation on banks performance is conflicting. Studies by Athanasoglou et al. (2005), Flamini et al. (2009), Uremadu (2012) and Rahman et al. (2015) reported that inflation has a negative impact on bank's performance.

### 3. METHODOLOGY

A multiple regression model vector error correction model (VECM) approach was used to investigate the level of the impact of the consolidation targeted variables (capitalization, bank-size, concentration, and liquidity) alongside economic growth rate and inflation on the banking industry's performance. This follows the works of Athanasoglou et al. (2005); Naceur (2003); Flamini et al. (2009) and Al-Tamimi (2010) with modifications mostly in the determining variables to suit this study, we express the relationship between the determining variables and BIP as:

$$BIP = f(\text{Bksize, Constn, Cpaqcy, Liqdy, Gdpgwt, Inflat})$$

And specify the regression model in a linear form as:

$$BIP = \beta_0 + \beta_1 \text{Bksize} + \beta_2 \text{Constn} + \beta_3 \text{Cpaqcy} + \beta_4 \text{Liqdy} + \beta_5 \text{Gdpgwt} + \beta_6 \text{Inflat} + \sum \epsilon_t \quad (1)$$

The a priori expectations of the coefficient to be estimated are  $\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5 > 0$ , while  $\beta_6$  can be  $0 < \beta_6 < 0$ , and  $\beta_0$  being the constant.

Where:

BIP = Banking industry performance represented by return on equity and measured as net income over total equity capital.

Bksize = Bank-size measured as the natural logarithm of the bank's total assets.

Constn = Concentration of the industry measured with Herfindahl-Hirschman Index (HHI).

HHI =  $\sum MS^2$ .

Where, MS is market share held by each of the banks in the industry.

Cpaqcy = Capital adequacy of the banks measured as the ratio of gross capital to total assets.

Liqdty = Liquidity measured as the ratio of liquid assets to total deposits.

Gdpgwt = Economic growth measured as real gross domestic product growth rate.

Inflat = Inflation rate and

$\Sigma\epsilon$  = error term.

In regression analysis, time series need to be stationary; a stationarity test was conducted on the time series data used for the analysis. The series were integrated of order one 1(1), Johansen multivariate co-integration test was applied. Long run equilibrium relationship among the series was confirmed and that led to the application of VECM. The data were obtained from CBN Statistical Bulletin, Nigerian deposit insurance cooperation Annual Reports and Annual Financial Reports of the banks.

#### 4. EMPIRICAL RESULTS

The result of the VECM is presented in Table 1.

The normalized co integrating coefficients are:

BIP	Bksize	Constn	Capdcy	Liqdty	Gdpgwt	Inflat	Constant
1	+0.96	+6.52	-3.90	+7.44	+0.14	-0.02	-75.60
	(5.11)	(9.49)	(-6.68)	(13.60)	(0.80)	(-15.5)	

This can be written as:

$$VEC = 1BIP -75.60 + 0.96 Bksize + 6.52 Constn - 3.90 Capdcy + 7.44 Liqdty + 0.14 Gdpgwt - 0.02 Inflat$$

Therefore,

$$1BIP = 75.60 - 0.96 Bksize - 6.52 Constn + 3.90 Capdcy - 7.44 Liqdty - 0.14 Gdpgwt + 0.02 Inflat + VEC$$

From the findings as reported in the equation based on Table 1, BIP takes the form of 1 indicating that it is the dependent variable while others remained independent variables.

The finding shows that the size of the banking industry, concentrations and liquidity have negative impacts on the banking industry's performance indicating that a one point

increment in the size of the industry reduces performances by 0.96%, 6.52% and 7.44% respectively. However, capital adequacy has positive and significant impact indicating that one point increment in capital adequacy increases the industry's performance by 3.90%. Furthermore, the finding shows that economic growth rate had negative but insignificant impacts on the banking industry's performance. A one point increment in the economic growth rate reduced the BIP by 0.14%. The level of inflation had positive but insignificant impact on the industry's performance. A one point increment in inflation rate increased the BIP by 0.02%.

The values 0.44 and 0.30 for R<sup>2</sup> and adjusted R<sup>2</sup> respectively indicate that the consolidation targeted variables and the controlled variables (economic growth and inflation) explained 44% variation in the BIP. This indicates that there are other variables apart from the consolidation targeted variables that determine banking industry's performance in Nigeria. The F-statistics value of 3.18 having a probability value of 0.0194 indicates that the explanatory variables are individually and jointly significant and adequate in explaining the banking industry's performance.

To ascertain the normality and the stability of the VECM, and to be sure that there was no autocorrelation, it was subjected to series of post diagnostics tests. The results of these tests indicated that there is no problem of serial correlation, autocorrelation, Heteroscedasticity, and that the model is stable.

#### 4.1. Discussion of Findings

The revelation that bank's concentration did not improve (contrary to the expectation of the consolidation policy) but rather deteriorated BIP in Nigeria can be attributed to the fact that the banks that remained in the industry after the consolidation were still not too small in number, thus, making it difficult for them to collude and make monopolistic profit associated with concentration. Furthermore, the CBN did intervene in the operations of the banks to influence the maximum lending rate of interest in the industry, thus making it difficult for the banks to charge abnormal lending rate of interest associated with market power whether the industry is concentrated or not. Our finding does not support the structure conduct performance hypothesis that reduction in the number of firms in an industry improves the industry performance. This finding is contrary to the findings of Gilbert (1984) and Molynux et al. (1996) that concentration improves banks performance. However, it is consistent with

**Table 1: Result of the VECM**

Variable	Coefficient	Standard error	Z-statistics	P
Bip	1			
Bksize	0.9609964	0.1879458	5.11	0.000
Constn	6.524572	0.6876075	9.49	0.000
Cpaqcy	-3.899667	0.5834458	-6.68	0.000
Liqdty	7.444169	0.5474152	13.60	0.000
Gdpgwt	0.1385617	0.1731791	0.80	0.424
InflatM Cons	-0.0193195-75.60481	0.1324941	-0.15	0.884
R <sup>2</sup>	0.44		D.W statistic	1.97633
Adjusted R <sup>2</sup>	0.30		F-statistics	3.18
Root MSE	0.4312		Prob (F-statistics)	0.0194

Source: Author's computation using Stata 9.1. VECM: Vector error correction model

the findings of Berger (1995), Athanasoglou et al. (2005), and Pasiouras and Kosmidou (2007).

It was discovered from the study that as bank-size increased in Nigeria their performance diminished. The explanations to this finding can partly be found in the diseconomies of scale. Large size banks usually face scale inefficiencies (Demirgüç-Kunt and Maksimovic, 1998). The finding is consistent with the findings of Boyd and Runkle (1993), and Naceur (2003), but contrary to the findings of Akhavein et al. (1997) and Ramadan et al. (2011) findings that bank-size enhances banks performance.

The finding from the study that increase in liquidity negatively affects banking industry's performance in Nigeria is in line with the basic fact that holding of relatively high liquidity by banks reduces the fund available for earning assets and off-balance sheet investments, hence, the profit thereof. Liquid assets yield little or no returns. Increasing liquidity only provides banks with security against the risk of not having sufficient funds to meet financial commitments at any point in time. There is always a trade-off between liquidity assets and profitability. As liquidity increases, profitability and performances reduces, and that was what happened in this case. This finding is consistent with the findings of Al-Tamimi (2010) but contrary to Uremadu (2012).

The finding that capital adequacy increased BIP in Nigeria is consistent with the findings of Berger (1995), Athanasoglou et al. (2005), Ramadan et al. (2011) and Ani et al. (2012). The positive relationship between capital adequacy and BIP is because capital adequacy increased people's confidence and patronage of the banks, increases the ability of the banks to give out more loans, invest more and provides other off-balance sheet services more. In addition, capital adequacy enhanced the bank's ability to withstand financial instability that results from unexpected losses and high incidence of non-performing loans. All these put together improved the industry's performance.

The study's finding that economic growth did not increase, but, rather reduced BIP (though the impact is not significant) in Nigeria is at variance with the widely held growth-lead-finance hypothesis that increase economic activities increase banking industry's performance. According to Robinson's (1952) assertion, financial development follows economic growth. The explanations of the growth-lead-finance hypothesis, is that as an economy grows, demand for investable funds to provide more goods and services for the growing economy increases as well, making banks to charge high interest on lending, and due to the increasing economic activities borrowers are able to pay back their loans. These in turn make the banks to lend more thus improving their profit and overall performance.

Furthermore, it is argued that as the economy grows, the resultant improvement in technology and infrastructure reduces banks operating costs and consequently their profitability and performance improves. The Nigerian case does not follow these mechanisms, because greater % age of products consumed in Nigeria are imported produced by small scale farmers which are not funded by Nigerian banks. The finding is consistent with

Naceur (2003)'s finding that economic growth acted as incentive for more banks to enter the industry and increased competition and costs thus reducing the industry's performance but contrary to Demirgüç-Kunt and Huizinga (1998), Athanasoglou et al. (2005), Beck et al. (2006) and Flamini et al. (2009) findings that economic growth increases banks performances.

Our finding of an insignificant positive relationship between inflation and BIP in Nigeria can be attributed to two factors. One, lending rate of interest charged by most banks in Nigeria moves with inflation (moving as against fixed rate of interest) such that even after the loan has been given to the customer, the interest rate is still adjusted upward with any significant increment in inflation thus countering the negative effects inflation would have had on performance. The second factor is that banks usually factored-in anticipated inflation into the rate charged borrowers initially. Thus, inflation added more to banks revenue than it added to cost. This finding is consistent with the findings of Bourke (1989); Molynux and Thornton (1992); and Davydenko (2011) in which they reported significant positive relationship between inflation and banks performance. The finding is however contrary to Demirgüç-Kunt and Huizinga (1998) contention that in developing countries inflation reduces banks profitability and performance due to the fact that costs increase faster than revenue in inflationary environment mostly in developing countries.

## 5. CONCLUSION AND RECOMMENDATIONS

The study determined the impact of banks consolidation targeted variables on the performance of the Nigerian industry. The analysis done using VECM revealed that the size, concentrations and liquidity had negative impacts, while, capital adequacy had positive impact on the banking industry's performance. Furthermore, economic growth showed negative but insignificant impact on the banking industry's performance and inflation showed positive but insignificant impact on the industry's performance.

Among the consolidation targeted variables (i.e., concentration, bank-size, capital adequacy and liquidity) together with economic growth and inflation that were included as control variables in the study; concentration, bank-size and liquidity negatively affected BIP in Nigeria. It is only capital adequacy that had significant positive impacts on BIP in Nigeria. While, economic growth had an insignificant negative impact and inflation had positive insignificant impact on the BIP.

Based on the findings, the consolidation targeted variables as there were should have been relied upon solely as the means of improving the performance of the Nigerian banking industry. Consequently, the following recommendations are made with the view of repositioning the industry for better performance.

The regulatory authority should constantly ensure that banks maintained regulated capital adequacy ratio as it improve the banks. The industry should not be concentrated as finding showed that it is better to have many as against fewer banks in the industry

stimulating competition which in turn foster more financial services innovations that improve the industry's performance. Banks should be categorized into different sizes and be allowed to choose any category they can efficiently manage depending on their capacity, experience, and mode of operation. The banks should improve on their long term deposits mobilization as a vital source of meeting their liquidity needs. In addition, CBN should through its recently introduced cashless policy reduce further the maximum amount of cash withdraw-able in a day so as to further reduce the liquidity needs of the banks. The banks should innovate and design financial products that meet the needs of all income groups for more all-inclusive banking and economy that will positively impact the banks.

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