



RESEARCH ARTICLE

REVISITING THE RELATIONSHIP BETWEEN CAPITAL ADEQUACY AND THE PERFORMANCE
OF DEPOSIT MONEY BANK IN NIGERIA

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ABSTRACT

This study empirically examined the effect of capital adequacy on the performance of deposit money in Nigeria from 1990 to 2015. Data for the study were secondary data sourced from annual report of Access Bank Plc, CBN Statistical Bulletin and journal articles for the years under scope. We employed ADF unit root, Johansoncointegration and ECM techniques to analyze the nature of the relationship between capital adequacy (core capital and supplementary capital) and Performance (profitability) of deposit money bank. The result indicates that both forms of capital adequacy have positive and significant influence on bank profitability. We therefore recommend among others that provision of adequate capital regulation; provision of infrastructural base to support banking services and stability of the institution must be of imperative to the central monetary authority.

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INTRODUCTION

Capital is an important factor in enhancing any business performance including banks. Capital adequacy measured by capital –asset ratio is a necessity for banks' effective operation which is a function of the deposits and capital funds (Okafor, Ikechukwu and Adebimpe, 2010). Sufficiency of banks' capital is one of the major concerns of customers for the safety of their deposits. Banks as financial intermediaries obtain their capital through owners' funds, reserves and share capital. The profit earning capacity of banks depends on the prudent combination of assets and liabilities to meet the liquidity and solvency requirements imposed by the environment including the monetary and banking policies (Berger, 1995; Longe. 2005; Nnanna, 2005; Okaforet al, 2010). To ensure availability of funds at any point in time (in meeting with customer's need), statutory requirements must be in place to regulate banks' capital which helps to reduce insolvency of banks (Yudistira, 2003; Brash, 2001; Naceur, and Kandil, 2008). Also, the level of risk as part of banks business operation depends on the capital fund. Hence, it is mandatory that the apex bank in Nigeria control and regulate the operations of bank so as to ensure customer's safety, strengthen and promote soundness,

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stability and efficiency of the banking system. However, in Nigeria, the Central Bank (CBN) being the apex bank has the statutory obligation to regulate banks' capitalization as a means of mitigating their solvency problems that may destabilize domestic and international financial system (Bernauer and Koubi, 2002; Brash, 2001; Okafor, et al., 2010). Compliance with this statutory requirement has led to the adoption of various strategies in the banking industry including merger and acquisition and banks shopping for investible funds through the capital market. Thus the exercise will protect banks customers' deposits and confer confidence on them in dealing with banks (Soludo, 2005). He also stated that the need for recapitalization arises from the fact that banks have not played their expected role in the development of the economy because of their weak capital base and as such, the decision to increase the capital base of banks with the aim of strengthening and consolidating the banking system. The need for the banks' reform arises from the fact that banks play important role in any nation's economic growth and development. However, the banks in Nigeria have not made much difference as long as economic development and growth is concerned. For instance, governments' efforts in ensuring that banks are more involved in financing the real sectors of the economy (through monetary guideline on their lending policy) has not yielded much result rather systemic distress has continued to frustrate the banking system. The number of distressed banks has been on the increase since 1991 irrespective of the capital base of these banks which was fixed at N600,000 and N2million for

indigenous commercial and merchant banks respectively (Uremandu, 2000). The report of Nigeria Deposit Insurance Corporation NDIC) and CBN showed that in 1991, only 8 banks were distressed, but this figure drastically increased from 16 in 1992, to 33 in 1993 and further to 60 in 1995 (Uremandu, 2000). Probably, this might be as a result of low capital base of these banks which was later reviewed by monetary authorities upwards to N 500,000 for both commercial and merchant banks. Since then, distress in bank has been on the increase until 2005 when it became obvious that reform in the banking industry is a necessity (Nnanna, 2005). Hence, the recent reform post consolidation is to reposition the banks in Nigeria for competitiveness and soundness. Few studies have looked at the relationship of capital availability on bank operations. Therefore, this study seeks to find out the relationship between capital adequacy of Deposit money banks and its performance. This paper is structured into five sections. Section one is the introduction, section two examines the conceptual framework and literature review, section three centers on the research methods and model specifications, section four is the results of the statistical analysis while section five is conclusion and recommendations

REVIEW OF RELATED LITERATURE

Conceptual Framework/theoretical framework: Capital adequacy is a conception that results from the idea of re-arranging the existing capital structure of banks in order to restructure the banking industry against widespread distress (Eyo and Offiong, 2015). Adequate capital creates opportunity for a better standard in any business establishment and spurs business exertion towards a great performance (Santos, 1999). In Nigeria, the concept of recapitalization is a measure adopted by authorities at the period of under-capitalization in order to re-arrange the existing capital structure to meet up with the losses that accrued in the regime of increasing operation. Adequate capital aids recapitalization in the sense that it emerges to meet the need of individual banks in form of increasing the minimum paid-up capital so that banks can carry out their operation efficiently with their customers (Ogunleye, 2005).

Capital adequacy is highly emphasized in the banking management because of the sensitivity of banks to the economy in general and financial system in particular. According to Kosmidou (2008), recapitalization is a measure that puts out the dubious practice that largely led to the collapse of many banks therefore, acts as cleaning effort in the system. The effect of capital adequacy on the performance of DMBs cannot be under-estimated since adequate capital directly and automatically influences the amount of funds available for loans and advances (major asset), which invariably affects the level and degree of risk absorption. Despite its many roles and diverse functions, it is clear that bank capital acts as protective cushion against the risk of failures precipitated by certain kind of uncertainties (Pasioras and Kosmidou, 2007). This is of the view that capital as a constraint to avoid defaults acts as a cushion to protect depositors and other creditors against operating and financial losses and losses at liquidation stage. Gul, Irshad, and Zamanis (2011), are of the point of view that as depositors are growing, so must capital also grow. The effect of capital adequacy lies in the fact that it assists to spread the cost of prudent business conduct and deters the criminally minded.

They explained that a bank requires capital adequacy for the same reasons other businesses may require capital while Al-Tamimi and Obeidat (2013), emphasized that the key element of capital for a bank is the only element common to all countries' banking system. Reference [15] states that, capital adequacy plays a significant role in the banking sector of an economy. The need for capital adequacy for banks is a pressing problem not only in Nigeria but also a very large extent in many other countries globally.

Role of Deposit Money Banks (DMBs) in Nigeria: The activities of the banking sub-sector have dominated the Nigerian financial system (Adeyemi, 2006; Akpan, 2010). The economy of any country depends on banking as it contributes to the economic development of the country (Cynthia, 2003). According to Santos (1999), their roles include; inculcation of banking habits to the populace; mobilization of savings for investment purposes: which is achieved through keeping savings, fixed deposit and current accounts for customers; channeling resources from surplus economic units to the deficit economic units for investment purposes. This consists of the provision of loans and advances to the private and public sectors for various and for the growth of domestic output and promotion of the export trade, agricultural production and provision of infrastructure. DMBs assist the government in the implementation of monetary and credit policies, provision of short-term and long-term credit to the public sector, serving as channel for implementing the various bilateral and multi-lateral trade agreements and policies, constituting avenues for the provision of various finance schemes designed to revamp the economy, providing advisory services, ensuring project conception and management, investment management, acting as agents to the government for dealing in foreign exchange, enhancing international trade, conducting brokerage services i.e. buying and selling of stocks for their clients thereby assisting in the development of the capital market and promotion of investment culture which lead to economic growth and development. Igwuike (2005) describes that the role of DMBs is broadly classified into two, namely, the money creating and service rendering role.

The more important of these, within the national economy, is the money creating role which is accomplished through the mobilization of capital. The service rendering role of deposit money banks comprises keeping of accounts for their customers, which may be current, savings or time deposit; provision of facilities for domestic and foreign remittances for their customers, including the provision of ordinary cheques, travelers cheques and foreign currency; collection and settlement of national and international debts arising from domestic and external trade for their customers including the provision of letters of credit; provision of facilities for their customers for the saving of their money and for the safe custody of their valuables; undertaking visibility studies and rendering financial and investment advice and other corporate help to their customers; and undertaking of trust and administration of estates, especially for their deceased customers. Invariably, the activities performed by DMBs accelerate the economic development of a nation (CBN, 2012).

Banks' Capital Adequacy Regulation--Basel Review: The regulatory framework of the banking institutions ensures on orderly growth of the system. The imposition by the regulators of minimum capital standards on financial institution was one important part of development in the economy.

Most banks regulators see capital adequacy regulation as a means of strengthening the safety and soundness of the banking industry (Nzotta, 2004). The capital position of banks has been regulated for generations longer than any other financial firm. Capital adequacy by definition is seen as a quantum of fund, which a financial institution should have and plan to maintain in order to conduct its business in a prudent manner (Kishore, 2005; Pandey, 2005). Adequate capital is regarded as the amount of capital that can effectively discharge the primary function of preventing banking industry failure by absorbing financial and operating losses. The reasons for regulating bank capital are to provide cushion against the risk of failures, preserve public confidence in banks and to limit the losses to the federal government arising from payment of insurance claims (Rose, 1998; Sanusi, 2012). The 1988 agreement known as Basel Accord, the Bank for International Settlements (BIS) established a framework for measuring bank capital adequacy for banks in the group of ten industrialized countries. The Basel Accord provided for a minimum bank capital adequacy ratio of 8 percent of risk-weighted assets for bank that operate internationally.

The Need for Capital Regulation: Since banks need capital for variety of purposes, these pose a need for regulation. Regulation is necessary in the case of bank specifically to maintain safe and sound banking system that can meet its obligation without difficulty. The banking sector is highly prone to volatility and fragility either arising from exogenous or endogenous shocks and are therefore amendable to regulation and supervision (Oloyede, 1994). According to Mishkin (1997), the establishment of a strong bank supervision system will be one way out of financial crisis. This view is in line with the negative impact of moral hazard and price shocks on the financial system thereby leading to a reduction in bank distress and failure. Capital regulation is instrumental in the growth and financial credibility of Nigerian DMBs by making sure that all the financial banks operating in the country has a capital base (required reserves). This help to make sure that bank customers just don't bear the loss alone, in the event of liquidation. However, capital regulation led to some Nigerian deposit money banks to fail; some banks could not meet up with capital base which was N25billion at the time (Soludo, 2006). These banks that could not meet up had to fold up, while some that could not come up with the money on their own, had to merge together with other banks in order to raise money. This regulation helped solidify the deposit money banks of Nigeria, and made it possible for individuals or organization without financial stability to operate a bank in the country. Today, Nigeria has one of the most advanced financial sectors in Africa, with most of its DMBs having branches in other countries.

Empirical Evidence: Capital ratio has long been a valuable tool for assessing capital adequacy and should capture the general safety and soundness of banks. It is generally believed that well-captured bank's face lower expected costs of financial distress and such advantage will then be translated into high profitability. In the study of banking profitability across eighteen countries for the period 1986-1989, Molyneux and Thornton(1992) also found out that capital ratio impacts bank's performance positively, although such relationship is confined to just the state-owned banks. Ngo (2006) attempted to find out the effect of endogenous capital and profitability in banking. He investigated the relationship between bank capital and profitability. According to his study and the best of his

knowledge, no previous paper had analyzed the problem in two-equation structural model. Contrary to what is often reported with surprising frequency in this field of research, his results showed no satisfying significant relationship between capital and profitability. Given non-binding capital requirements his finding was consistent with the view that, while raising capital is costly for banks, it is associated with compensating benefits that offset these additional costs. Consequently, when capital structure is endogenously determined in a profit maximizing equilibrium, no systematic relationship between capital and profit expected.

Demircuc-Kunt and Huizingz (1999) conducted a more comprehensive study which examined the determinants of banking performance for 80 countries, both developed and developing, during the period 1988-1995. They concluded that foreign banks have higher profitability than domestic banks in developing countries while the opposite holds in developed countries. Nevertheless, their overall results showed support for positive relationship between the capital ratio and financial performance. Hassan et al. (2008) analyzed how bank characteristics and the overall financial environment affected the performance of Islamic banks. Utilizing bank level data, that study examined the performance indicators of Islamic bank's worldwide during 1994-2001. A variety of internal and external banking characteristics were used to predict profitability and efficiency. In the genera, their analysis of determinants of Islamic bank profitability confirmed previous findings. Flamini, Calvin and Liliana (2009) used a sample of 389 banks in 41 SSA countries to study the determinants of bank profitability. They found out that apart from credit risk, higher return on assets are associated with larger bank size, activity diversification, and private ownership. Bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion. Their results also indicated moderate persistence in profitability. Sanusi (2010) was even more satirical in answering the question of how much capital a bank needs to ensure the confidence of depositors, creditors, investors and regulators in a country of high inflation rate and economic instability, when he noted "that in banking and finance literature, this question is noted as the issue of capital adequacy.

MATERIALS AND METHODS

Research Design and sources of data: The research design for this study is analytical; hence, it adopts the regression approach. Data for the study are secondary data which were sourced from the CBN Statistical Bulletin and Annual Report of Deposit money banks between the periods of 1999 – 2015.

Specification of the Model: The method of analysis adopted is the multiple regression analysis in order to determine the relationship and magnitude of relationship between the variables. Hence to test the hypothesis already stated, it is specified that the performance of Deposit money banks is a function of capital adequacy

$$PFM = f(CAP).$$

where, PFM = Performance.

CAP = Capital adequacy.

Performance of Deposit money banks is represented with profitability (Prof).

Unit Root Result

Variable	ADF Test statistics	Test critical value	Max lag	Order of Integration	Level of significance
PROF	-5.073838	-2.998064	1	1(1)	5%
CC	-7.537837	-2.991878	1	1(1)	5%
SC	-3.943346	-2.991878	1	1(1)	5%

Source: author's computation from Appendix 2

4Johanson Cointegration Result

Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None *	0.751045	43.28355	42.44	48.45
At most 1	0.300811	11.30243	25.32	30.45
At most 2	0.125038	3.072233	12.25	16.26
Trace test indicates 1 cointegrating equation(s) at the 5% level				
Trace test indicates no cointegration at the 1% level				
*(**) denotes rejection of the hypothesis at the 5%(1%) level				
Hypothesized		Max-Eigen	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.751045	31.98111	25.54	30.34
At most 1	0.300811	8.230201	18.96	23.65
At most 2	0.125038	3.072233	12.25	16.26
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels				
*(**) denotes rejection of the hypothesis at the 5%(1%) level				

Table 4.2 The Parsimonious Regression Result

Dependent Variable: D(PROF)

Method: Least Squares

Date: 02/28/18 Time: 20:45

Sample (adjusted): 1997 2015

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	330614.7	658985.2	0.501703	0.6279
D(PROF(-1))	0.677303	0.306580	2.209220	0.0545
DLOG(CC(-1))	743280.7	511792.8	3.452308	0.0004
DLOG(CC(-3))	336672.8	464923.7	2.724146	0.0024
D(SC(-1))	2.303350	0.593904	3.878320	0.0037
D(SC(-2))	-8.401225	1.491671	-5.632090	0.0003
D(SC(-3))	7.227547	1.381886	5.230204	0.0005
D(SC(-4))	-3.806639	0.885228	-4.300182	0.0020
D(SC(-5))	12.93813	3.951113	3.274555	0.0096
ECM(-1)	-0.821024	0.556527	-3.475263	0.0042
R-squared	0.940869	Mean dependent var		2072610.
Adjusted R-squared	0.881738	S.D. dependent var		6505790.
S.E. of regression	2237288.	Akaike info criterion		32.38484
Sum squared resid	4.50E+13	Schwarz criterion		32.88192
Log likelihood	-297.6560	Hannan-Quinn criter.		32.46897
F-statistic	15.91166	Durbin-Watson stat		1.738976
Prob(F-statistic)	0.000166			

Source: Author's computation using Eviews 9

Capital adequacy is broken into two forms which are Core capital (Cc) and Supplementary capital (Sc) where, Prof = Profitability
Cc = Core capital.

Sc= Supplementary capital.
Therefore, Prof = f (Cc, Sc)
The Regression Model Prof = $\beta_0 + \beta_1 Cc + \beta_2 Sc + \mu$
where, Prof = Estimated value of the dependent variable

β_0 = Intercept term

β_1 and β_2 = The regression plane of the two independent variables

Cc and Sc= the independent variables

μ = Error term

Method of Data Analysis

The data were analyzed using the OLS of multiple regression with first -order tests (F-statistics, and R^2) estimated. The second order tests (such as autocorrelation, multicollinearity, and Heteroscedasticity tests) were also estimated. E-views 9 were employed to analyze the results of the data.

Presentation and analysis of data

Estimation and Data Analysis

The data were analyzed using computer based on the E-view software. From the above table, it can be inferred that most of the variables are not stationary that is, they are not integrated at the same level of $I(0)$ but when differenced of order one, they become stationary ($I(1)$). So there is need for cointegration test. The above result indicates both trace test and Max-eigenvalue test indicate one cointegrating equation which imply that one of the variables are cointegrated. Hence there is a long run relationship among the variables. Since the variables are cointegrated, we go for a vector error correction mechanism to determine the short run dynamics of the analysis.

Error correction model: In order to develop the error correction model, the lagged residuals from the cointegrating regression are incorporated in an OLS estimation incorporating the first differences of all the variables and the differences of all variables from the cointegrating vector as independent variable. The methodology employed in deriving the preferred short run dynamic model is the general approach. Initially, a highly general error correction model was specified, which include lags up to the fourth order. This general model was then tested in order to arrive at a parsimonious preferred short run dynamic specification. From the above parsimonious short run adjustment model, capital adequacy explained 94% change in Deposit money banks profitability or performance. Hence, the coefficient of determination was high and the overall result was significant. The coefficient error correction term (-0.821024) implies that at every interval, 82% of the error is being corrected. Hence, the ECM is very high, rightly signed and statistically significant. A critical look at the result above shows that CC (core capital) at lag 1 and 3 had positive and significant relationship with banks performance. While SC (supplementary capital) at lag1, 3 and 5 had positive and significant relationship with the banks' performance. However, Sc has inverse and significant impact on Deposit money banks performance at lag 2 and 4. This further means that SC and CC met apriori expectation since increase in sc and cc will lead to rise in the bank's performance.

Summary, Conclusion and Recommendations

Summary of Findings

From the foregoing, there is no significant relationship between Core capital and profitability of Deposit money banks while there exist a significant relationship between Supplementary capital and profitability of the bank under study. It was found out that supplementary capital is thus, a backbone of profitability

Conclusion

From the findings of the study, it is pertinent to note that Supplementary capital which is a type of capital reviewed in Basel I plays a pivotal role in the performance of Deposit money banks which aids towards its profitability while Core capital does not have a significant relationship with its profitability. However, capital adequacy of banks (Basel I review) has a crucial role to play in the performance of DMBs, from Deposit money banks point of view, which aids their efficiency and effectiveness through their deposit mobilization and lending activities with respect to granting of credit and giving out of loans and advances. Finally, the banking sector has always received upper attention on protection due to the vital role it plays in an economy. That's why the stability of the banks is of utmost importance to the regulatory body so as to stabilize the economy which will eventually aid towards the growth and development of the nation.

Recommendations

Based on the entire study especially the findings, we recommend that

- Government should pay more attention to this sector because it is observed that in a developing country like
- Nigeria, banks play an important role hence, their performance directly affects the growth, efficiency and stability of the economy;
- The Central monetary authority should make provisions for adequate capital regulation to reduce the chances of banking distress. This should be on a quarterly basis;
- Government should make banking environment more enabling by provision of adequate basic infrastructures to support banking services;
- Efforts should be made in strengthening regulatory and supervisory frameworks;
- Staff should be adequately informed on the imperatives of banks capital adequacy;
- Deposit money banks needs to take adequate care of her supplementary capital as this has a significant relationship with her profitability;
- The dragging effect that core capital has on profitability needs to be monitored and appraised constantly in order not to reduce shareholders' confidence in investing in the bank by way of a possible capital shore-up.

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Appendix 1

Table 1. Profitability And Capital Adequacy Of Deposit Money Banks

year	prof	cc	sc
1990	-891207.3	3467048.8	-274721.9
1991	-791748.4	3229423.7	-225954.3
1992	-692289.5	2991798.7	-177186.8
1993	-592830.6	2754173.6	-128419.2
1994	-493371.7	2516548.5	-79651.7
1995	-393912.8	2278923.4	-30884.1
1996	-294453.8	2041298.3	17883.5
1997	-194994.9	1803673.3	66651.0
1998	-95536	1566048.2	115418.6
1999	120456	3145353	110516.4
2000	130079	44205.7	152457.2
2001	77743	75170.6	235462.5
2002	55245	101276.5	338343.7
2003	556573	122735.9	414471.9
2004	637473	142324.5	543752.1
2005	501515	172321.5	778230.1
2006	737149	170494.9	105746.9
2007	6083439	1791491	152954.1
2008	16056464	210936.3	2880838
2009	22885794	219510	2733600
2010	12931441	249714.6	1037954
2011	13660448	949925.5	7588998
2012	36353643	808169.8	12820905
2013	31416066.73	438014.487	12112733.7
2014	35250598.7	361744.95	14277550.51
2015	39085130.68	285475.412	16442367.33

Source: Computed by authors from CBN Statistical bulletin and deposit Money bank annual reports for years under scope
