

## Implications of Capital Regulation on Bank Financial Health and Nigerian Economic Growth 1990-2006

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**Abstract:** Between 1990 and 2006, the regulatory authorities for the Nigerian banks subjected the sector to a series of capital adjustments to stabilize the industry. The practice generated growth in the structure, functionality and size of the system but with minimal effects on distress management and economic growth. This study evaluates the implications of capital regulation on Nigerian banks' financial health and economic growth 1990-2006. Data collected from the publications of bank regulatory authorities and other relevant literature were examined for theoretical relationship using the regression analysis; CAMEL-ratings and Granger causality test. CAMEL-ratings for the financial soundness of the sector was consistently <15% for >90% of the tested period but a regression test indicated a positive linkage ( $R^2 = 0.623$ ) between capital regulation, bank distress management and asset quality. However, a Granger causality test found that, while changes in economic growth is a predictor of bank capitalization, such capitalization has not significantly affected economic growth. The use of multiple regressions to test causality between variable remains a tools of general application at the theoretical level. Impacts of regulatory policies on bank performance have also been examined in some literature. However, little empirical work exists that links the regulation of bank capital to financial health and economic growth especially, in the Nigerian case. This study contributes in this area.

**Key words:** Capital regulation, distress management, economic growth, bank-asset quality, camel-ratings

### INTRODUCTION

Banking institutions occupy a central position in the financial system of any nation and are essential agents in the development process of market economies. Commercial banks are particularly relied on for the promotion of financial integration of the various parts of a country; bring about improvements in the mobilization and utilization of funds for increased capital formation. Mckinnon (1973) and Shaw (1973) among other theorists collectively state that financial intermediation through the banking system induces economic growth assuming there are no government policies and legislation working towards distorting its growth Boriented effects. Other issues are those of maintaining sound financial system, which can function effectively in providing substantial proportion of business credit as well as ensure the workability of the payment system. In effect, the failure of a banking system vis-à-vis the inability to supply appropriate quantity of credit can be damaging to an economy more than the failure of any other form of businesses (Okagbue and Aliko, 2005).

Some literatures have submitted that for banks to be able to function effectively and contribute meaningfully to the development of a country, it must be financially healthy, (Mishkin, 1992; Greensphan, 2004; Oboh, 2005).

**Statement of the problem:** The Central Bank of Nigeria (CBN) Decree 21, 1990 and Bank and Other Financial Institution, Decree (BOFID) 1991 represent significant watersheds in capital regulation for the Nigerian banking system. From a modest value of ten million naira minimum paid up capital in 1988, Nigerian Commercial banks were required to maintain capital not below N50 million in 1991. Between 1991 and 2005 subsequent increases have also been made ranging from ₦500 million (1997); ₦2 billion (2002) to ₦25 billion in 2005.

While, various regulatory approaches starting from deregulation to consolidation have brought about growth in the size, structures and functions of the Nigerian banking system, capital regulation cannot be said to have been efficient in ensuring a stable banking system or a corresponding level of economic growth.

This study is generally designed to relate selected bank performance statistics to certain indicators of economic growth and bank financial health.

Specific objectives of the study examine:

- Effectiveness of capital regulation on bank financial health and by implication the level of soundness of the banking industry.
- Causal relationship between the level of bank capitalization and Nigerian economic growth.

Understanding the relationship between the level of bank capitalization, financial health and Nigerian economic growth will afford both the bank management and regulatory authorities information required for policy formulation.

**Conceptual issues:** Bank regulatory framework embodies a general philosophy and principles that guide both the content and implementation of specific regulations. Greunning and Bratanovic (2003) categorized regulatory approaches as either prescriptive or market oriented. A predictive approach simply prescribes the nature of activities as to who can open banks, cost of credit, branch networking, capitalization and other prudential controls. Market-oriented approach on the other hand, is based on the belief that a financial market will always function effectively and is therefore capable of managing related financial risks given agreement between participants on common objectives. The Nigerian regulatory authorities have concentrated on the use of the first approach the basic defect of which centers on the facts that regulations often become outdated or ineffective to address risks stemming from current financial innovations or economic realities.

Studies on the relationship between financial system reforms, bank performance and capital accumulation can be found in (Sani and Yakpogoro, 1997; Isijiola, 2000; Adebisi, 2000; Ogunleye, 2003).

However, the general contention is that the success of any banking reform will be a function of the pattern of value configuration shared by the bank management as well as their ability to offer economic sectors a great variety of assets that correspond to the needs and preference of the economic agents Samnes (2001) and Cadbury (2002).

Economic development as a concept that encapsulates a general level of efficiency attained in a nation's production process with respect to output, real incomes and standard of living presupposes the availability of capital to drive the growth (Anao, 1995; Adedipe, 2005). An adequately capitalized economic sector can design and pursue growth objectives that are obviously out of the reach of a less capitalized sector.

Apart from the multiplier effects on the economy, bank capital enhancement are *prima facie* designed to improve the level of operational resources, provide bank financial health (Calstrom and Samolysk, 1995; NDIC, 2004; CBN, 2005).

**Model formulation:** The primary task in this study is to consider the extent of relationship that exists between the core variables constituting Nigerian bank capitalization the financial health and level of economic development in the period 1990-2006.

The postulations are:

- That changing level of bank minimum paid-up capital reduces the level of distress within the banking system and by implication improves the financial health.
- That causal relationship exists between changing level of bank minimum paid-up capital and Nigerian economic growth.

Expressed mathematically as:

$$C = f(RDB + AQ + CAMEL + e) \quad (1)$$

$$C = f(GDP + e) \quad (2)$$

Where:

- C = Level of commercial bank capitalization in the study period.
- RBD = Rates of distressed banks to total banks within the sector.
- AQ = Asset quality of the commercial banks within the Nigerian banking system.
- e = Stochastic error term.

To estimate Eq. 1, surrogates of bank financial health including proportion of healthy banks to total banks in the system; performing loans to total loans, non-performing loans to shareholders fund and CAMEL parameters are used. CAMEL parameters here represents an acronym for capital Adequacy (C) Asset Quality (A) Management Quality (M) Earnings Quality (E) and level of Liquidity (L) in that order.

A null hypothesis is also tested via the regression result to determine lack of linkage between bank capitalization and financial health in the period using both the T-test and F-statistic.

To test for the causal relationship between two variables, the standard Granger (1969) test had been used in some literatures. The test states that, if past values of

a variable Y significantly contribute to forecast the value of another variable X, then Y is said to Granger cause X and vice versa.

The test is based on the following regression and assuming one lag length the equation to be estimated is expressed as:

$$CY_{t-1} = \beta_0 + \beta_1^{GDP} GDP_{t-1} + \beta^{CY} CY_t + e \quad (3)$$

$$GDP_t = \beta_c + \beta_1 GDP_{t-1} + \beta^{CY} t-1 Cy_{t-1} + e \quad (4)$$

Where:

- Cy<sub>t-1</sub> = Bank capitalization
- GDP = Real Gross Domestic product.
- β<sub>0</sub> = E<sub>0</sub> the constant
- β<sub>1</sub> = The Coefficient for the independence variable.

To estimate Eq. 3 the level of capitalization for the Nigerian banking system is used as a measure of bank capital enhancement.

The real gross domestic product is also used as a measure of economic growth.

Furthermore, the current value of the level of bank capitalization for a given year is regressed on the lagged value of itself and the lagged value of real gross domestic product. Similar approach is adopted for Eq. 4.

Null hypothesis are tested to determine that no causal linkage exist between the variables estimated in Eq. 2 and 3 using both the T and F-statistics.

**Measurement variables:** Variables of financial health used are derived mainly from CBN-statistical bulletins and Annual Reports as well as NDIC Statements of Account. The parameters are mainly level of bank capitalizations; the Gross Domestic Product (GDP), proportion of healthy/distressed banks within the system as well as other identified parameters as explained above. These are related for causality with the level of bank capitalization in the period and data used are presented in Appendix 1 and 2.

**EMPIRICAL RESULT AND INTERPRETATIONS**

**Bank capitalization and financial health:** Two approaches employed to examine the effectiveness of enhanced minimum capital on bank financial health are the CAMEL-rating and a regression analysis of selected variables.

The CAMEL -rating, which consist of a composite weighting parameters of selected financial ratios is designed for depicting the condition of the financial health of a bank or banking system. It provides a uniform platform to determine the extent of distress in a bank and by extension in a financial system as a whole NDIC (1996).

Table 1 analyses the quality of the banking sector = s risk assets and CAMEL Brating; that is the quality of bank risk assets and by implication the financial health of the industry. Notwithstanding increase in the minimum regulatory capital from ₦500 million to ₦2 billion between 2001-2005 banks adjudged to be sound were consistently, <15% of the total number for the 5-year period.

Furthermore, those banks whose performance were considered satisfactory represent about 70% of the total number of banks within the sector in 2001, a value, which has consistently reduced to 52.8% by 2005. The most remarkable impact was felt in 2006 when the percentage of banks adjudged sound reached an all time high of 40%.

The implication of this finding was that apart from under capitalization, other factors such as poor asset quality, weak corporate governance practices, poor ethics and professionalism, which could not be corrected by mere capital regulation were improved upon using the 2005 bank consolidation reform package. This reform package entails recapitalization, consolidation and a set of other guidelines designed to sanitize the system Soludo (2004).

**Bank capitalization and distress management:** A regression analysis designed to examine the relationship between changing level of bank Capitalization (CL) Rate of Distressed Bank (RDB) (X<sub>1</sub>) and Asset Quality (AQ) X<sub>2</sub>

Table 1: Financial soundness the banking system using the CAMEL 2001-2006

Category	2001		2002		2003		2004		2005		2006*	
Min. regulatory capital (N million)	500		1000		2000		2000		2000		25000	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
Sound	10	11.10	13	12.6	11	12.6	10	11.5	11	12.4	10	40
Satisfactory	63	70.00	54	60.9	53	60.9	51	58.6	47	52.8	12	48
Marginal	8	8.90	13	14.4	14	16.1	16	18.6	18	20.2	3	12
Unsound	9	10.00	10	11.1	9	10.4	10	15.5	13	14.6	-	-
Total	90	100.00	90	100.0	87	100.0	87	100.0	89	100.0	25	100

Source: Central bank of Nigeria, annual report and statement of account 2006. \*Following the conclusion of the banking sector consolidation exercise, the number of banks dropped from 89-25

found a satisfactory level of relationship between the variables. The estimated regression equation is as stated.

$$CL = 34.853 + (-0.567)X_1 + 0.670X_2 \quad (4)$$

- (0.67) (1.034)

Figure with  $\alpha$  being the constant coefficient, while those in parenthesis are the t-value. The dependent variable was also regressed on each of the two independent variables  $X_1$  and  $X_2$ . Summary of the findings indicates  $R^2 = 0.623$  indicating about 62.3% of the variation in the dependent variable, being influenced by or influencing the independent variables.

On the basis of the equation variable  $X_1$  (rate of distressed Banks) to total banks is found to have a negative relationship with rising capitalization, while the reversed is the case with variable  $X_2$ .

Given an F-value of 20.77 and t-value of 4.91 both of which are higher than tabulated values we therefore reject the null hypothesis and concluded that linkage exist between the variable at .05 level of significance.

**Data analysis on capitalization and economic growth:** To examine the causal relationship between rising level of Nigerian bank capitalization and economic growth; a Granger causality test was administered.

The variable used as a proxy for economic growth is the gross domestic product, while the levels of bank capitalization were adopted as the dependent variable.

In estimating Eq. 3 and 4, a dummy variable, which captures the various reforms since, 1990 was also introduced. This dummy takes the value of 1 in 1990 and 0 in 2006. This is to capture the impact of the reforms before the BOFID up to the post consolidation era.

The estimated regression Eq. 3' and 4' as well as the associated t-value (in parenthesis) are reported.

$$D.W \ 1.26 \ R^2 = 0.1298$$

$$R = 0.0095$$

$$CY = 28.965 - 0.348GDP \quad (5)$$

(1.8155)(-1.8529)

Both regression equation exhibit good fit and there is no problem of autocorrelation. This is revealed by the D.W statistics of 1.82 and 1.89 (almost 2) reported for the two equation.

It is noticeable in Eq. 3 where, our  $R^2 = 0.1298$ , that the t-value of coefficient of the lagged CL is negative with the F-statistics being 0.2190 far above the acceptance

**Table 2: Causality test bank capitalization to economic growth**

Null hypothesis	Obs	F-statistics	Probability
CL does not granger cause GDP	15	0.1910	0.2190
GDP does not granger cause CL	15	4.3200	0.2201

Pairwise granger causality test, Sample: 1990, 2006, Lag: 2

point of 0.05. So, we conclude that bank capitalization is not significant at the 0.05% level. The implication of this is that past level of economic growth might have influenced bank capitalization but the reversed has not been the case. We thus, accept the null hypothesis and concluded that bank capitalization does not Granger cause economic growth (Table 2).

The result of Eq. 4 on the other hand indicates a significant relationship between economic growth (GDP) and the level of bank capitalization. This is indicated by the t-value of 3.3120.

Moreover, the coefficient of multiple determination  $R^2$  in Eq. 4 indicates that 67% of variation in growth is caused by lagged values of gross domestic product and level of bank capitalization. The probability value of the F-statistics estimated was 0.02201, which is  $<0.05$  indicating that our null hypothesis has to be rejected.

This implies that changes in economic growth Granger causes level of bank capitalization and as such a predictor of bank capitalization.

## CONCLUSION

In this study, efforts have been made to examine the implications of series of capital adjustment policies administered on the Nigerian banking industry and national economic growth. It is designed against the backdrop of rising size of the Nigeria banking sector with less than commensurate growth in the other sectors of the economy on a collective basis.

For the purpose of the analysis two sets of objectives were designed to examine the impact of bank capitalization on the financial health of the sector as well as on the national economic growth. Both the CAMEL B ratings and a multiple regression analysis of parameters of bank financial health and capitalization were tested in the first instance.

In an attempt to examine, the causality between bank capitalization and economic growth; the Granger (1969) causality test was applied to provide empirical relationship. The examination sourced data on the basic variables and model estimation covering a period of 17 years, 1990-2006.

Our findings among others indicate minimal impacts of capitalization on bank CAMEL rating in the period

2001-2005. Significant relationship only become apparent in 2006 when capitalization was complemented with other reforms efforts. Notwithstanding this finding, capital enhancement is found to influence bank asset quality and reduce the proportion of distress within the system. A significant relationship was also found to exist between the level of bank capitalization and lagged valued of Gross Domestic Product (GDP) in Nigeria. The implication of the finding is that bank capital enhancement might be successful given the attainment of a particular level of economic growth. However, rising bank capitalization has not to a significant level influenced the level of economic growth. The finding negates previous literatures on causal relationship between economic growth and stock market activities (Mukhejee, 2002; Ogun and Iyoha, 2005). It however distressed Kamaiah (2001) who found no causal linkage between monetary policy and the real economic activities.

**RECOMMENDATIONS**

On the basis of the foregoing, this study now make the following recommendations. Capital regulation needs to be a component of total reform framework to ensure effectiveness. In particular, other parameters of bank financial health like the quality of corporate governance, ethics, product development and return rendition should be included in any banking reform for significant result. Furthermore the impacts of capital adjustment has reduced the level of bank distress to some extent but the goal of a sound financial system requires a zero tolerance, this is yet to be achieved on the Nigerian financial landscape.

In effect necessary policy framework should be put in place to improve on the quality of bank management the general security network, the reduction of fraudulent practices and insider dealings many of which factors have their effects on the banking sector stability.

Apart from infrastructural deficit other problems retarding economic growth in Nigeria are the stunted real sector development. With the rising volume of financial resources at the disposal of Nigeria banks; necessary strategies should be perfected to design enabling credit facilities whose tenor and terms will provide a symbiotic benefit to both the operators of the real-sector business and the banks.

Finally, well packaged reforms like the last banking consolidation exercise should be

constantly monitored to explore the full potentials and benefits to the economy at large rather than a myopic effect on the banking sector alone.

Appendix 1: Nigerian banks level of capitalization and real GDP (1990-2006)

Year	Level of bank capitalization	Real GDP
	₦ million	₦ million
1990	1823.900	87951.20
1991	2342.200	96780.70
1992	4544.500	113781.50
1993	8649.500	91980.30
1994	10600.000	77163.50
1995	12210.800	96093.40
1996	14214.800	102982.20
1997	28390.000	99015.10
1998	43158.320	87821.40
1999	48995.300	96080.20
2000	59871.700	134861.00
2001	75249.800	128584.70
2002	100274.800	113208.40
2003	119700.000	146527.50
2004	14186963.000	166528.50
2005	45180.880	286526.80
2006	N.a	32660.80

Source: CBN and NDIC statement of account and annual reports various issues

Appendix 2: Nigerian banks state of financial health (1990-2006)

Year	No. of banks	No of distressed banks	Asset quality of bank
	1990	58	N.a
1991	57	15	39.000
1992	60	16	45.000
1993	120	28	41.000
1994	117	45	43.000
1995	115	60	32.900
1996	115	58	33.900
1997	115	47	256.810
1998	89	22	19.350
1999	90	10	-
2000	88	13	21.500
2001	90	15	16.900
2002	90	14	21.300
2003	90	N.a	21.600
2004	89	10	23.080
2005	89	13	24.600
2006	25	N.a	30.500

Source: CBN and NDIC statement of account and annual reports various issues

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