Determinants of Capital Adequacy of Deposit Money Banks Listed on The Nigeria Stock Exchange

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Abstract

This study investigate the determinants of capital adequacy of deposit money banks listed on the Nigeria stock exchange for the period of ten years spanning from 2013 to 2022 using variables such as profitability, liquidity, leverage and size as explanatory variables and capital adequacy as the predictor variable. The study utilizes an OLS regression analysis with the aid of E-views using descriptive research design. The study found significantly positive effect of profitability and liquidity on capital adequacy. The study also found significantly negative effect of size on capital adequacy while the effect of leverage on capital adequacy is insignificant. The study therefore recommends that deposit money banks should reduce and minimize cost resulting from expansion and growth and should not source for external fund with higher interest rate.

Keywords: Adequacy, Profitability, Explanatory, Predictor, Regression, leverage

INTRODUCTION

Background to the study

It was an achievement via the Central bank of Nigeria, the increase in bank capital above 1000 percent. It was an exercise that resulted in the reduction of Nigeria motley group of mainly anemic banks to 25 bigger, stronger and more resilient financial institutions. The reforms engineered a revolution in the financial services industry leading to an increase both in the quality of service and quantity of financial products available to Nigerians and to checkmate the capital adequacy of the banks. Capital Adequacy can be percentage ratio of a financial institution's primary capital to its assets (loans and investments), used as a measure of its financial strength and stability. According to the Capital Adequacy Standard set by Bank for International Settlements (BIS), banks must have a primary capital base equal at least to eight percent of their assets: a bank that lends12 dollars for every dollar of its capital is within the prescribed limits. However, the assessment of capital adequacy for precautionary purposes is problematic at best due to rapidly changing economic and financial services industry. Another role of capital is the fact that the viability of a bank depends to a critical extent upon public confidence. There is a strong public relation aspect to capital adequacy also. It is generally recognized that the availability of capital is neither a perfect indicator of the state of health of a bank nor a sufficient condition to ensure the maintenance of confidence by depositors and creditors, but no doubt, it represents a major element

in shaping their perception of the solidity of an institution. Capital level is used by most regulators to restrict credit expansion. That explains why banks management are inspired to determine the correlation between variables like Total credit loan, Demand deposit, Inflation rate, Political instability, Money supply, Liquidity risk, Investment etc and Capital and hence indicate whether large capital are negatively or positively compel banks to meet the capital adequacy requirement or seek additional capital so as to meet their credit expansion target. By looking at banks role as a financial intermediaries, capital adequacy and macroeconomic variables have become a key indicator of a bank capital whereby inflation erodes banks capital in most developing countries. Indeed, several studies have found evidence that the development of the banking sector is related to economic growth. The importance of capital adequacy in the banking sub-sector of the Nigeria economic and financial development directs us to investigate which economic-macro or micro, banks ratios and balance sheet and institutional factors that give rise to a vibrant capital adequacy. Therefore, the problem here is to use co-integration to determine whether there is a linear relationship between banks capital and macroeconomics variables and if there is, whether the degree of linearity is such that capital adequacy issues could be largely a matter of bank failure or business exigencies as opposed to the current flex of legal muscle by the regulatory authorities. Against this backdrop, the objectives of the study are to empirically investigate the determinants of capital adequacy with respect to economics variables. To analyze the various issues involved in capital adequacy debate. To examine the components of bank capital and bank consideration in selecting capital mix expound the diverse measurement of capital adequacy particularly the CAMELS. Furthermore, capital adequacy in the banking sector model is to permit forecasting of capital adequacy pattern, which is useful for both policy makers and the banking sector in general for formulating informed course of action. In spite of the importance of banks as financial intermediaries, capital adequacy modeling has not been in the mainstream of econometric research into the financial sector in Nigeria. Analyses of the banking sector have so far focused on qualitative assessment of growth trends and sectoral behavior patterns in the industry. Discussion in those studies has, for instance, suggested a number of factors that may influence the failure pattern of banks, bank products and management. There has been no model designed to determine the relative impact of banks capital and macroeconomics variables and their possible linkages between the banking sector and the real sector of the economy. Since independence, no consensus has been reached by different Scholars as regards the determinants of capital adequacy with macroeconomics variables in Nigeria. Opinion differs among experts in banking and finance as to what constitutes adequate capital but they all agree that it is an age long issue for which there do not seem to be any consensus in sight. Thus as noted by Nwankwo (1990) and Adegbite (2010), the issue of what constitutes an adequate capital for banks has a long history. It is in fact, almost as old as banking itself. 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. Anyone who knows the answer can gain instant notoriety in the banking, financial and regulatory communities. The battle line appears drawn between the regulators and the bankers. Regulators concerned with the safety of banks, the viability of insurance funds and stability of financial markets prefer more capital. This reduce the likelihood of failure and increases bank liquidity. Bankers on the other

hand generally prefer to operate with less capital. The smaller a banker equity base, the greater the financial leverage and equity multiplier. High leverage converts a normal return on assets unto a high return on equity-Koch(2004). The complexity of the problem brings to the fore the following questions: what is capital? What are its components? What amount is adequate? Who determines it and what methodology is appropriate in measuring bank capital? And what factors determine capital adequacy? However, the battle between the banks and regulatory authorities is centered after a prolonged period of recession and macro-economic instability. Hitherto, several studies have emphasized the importance of capital adequacy and there is need to review related studies in order to gain more understanding of the subject. Mpuga (2002), argued that the inadequacy of minimum capital standards in accounting for risks in banks assets portfolio could be one of the major factors leading to bank failures. He studied the 1998-99 banking crisis in Uganda and how the new banking guidelines in Uganda was to increase bank solvency and capital adequacy by shifting their portfolio towards lower risk assets, in an effort to meet the new requirements Epstein (2005) studied on capital adequacy failures and concludes that capital adequacy and ratio analysis (CA&R) are failed strategies. However, analysis of the causes of failure has often been shallow and the measures of success weak. Yu Min-The (2006), defined the adequate capital for banks as the level at which the deposit insuring agency would just breakeven in guaranteeing the deposits of individual banks with premium the banks pay.

Statement of the problem

In 2009 the Central bank of Nigeria declared5 banks in Nigeria as insolvent. The banks were Afribank, Union Bank, Oceanic Bank, Bank PHB and Intercontinental Bank. In 2011 the Central Bank of Nigeria declares the take-over of Bank PHB, Sterling Bank and Afribank by investors or in other word call for the nationalization of those banks. Before the establishment of Central Bank of Nigeria in 1958 there have been serious cases of Bank failures and unhealthy capital adequacy base resulting to uncountable reasons of Bank failures. One of the crucial reasons of bank failure is inappropriate determinants of capital adequacy. The first bank failure and unhealthy capital adequacy in Nigeria can be traced to 1930swhen 21 Banks were identified as bankrupt. The second Bank failure in Nigeria can be traced to 1989 where 8 Banks were identified to be weak and in the year 1998 total bank distress were up to 31. Third Bank failure in Nigeria was in the year 2004 where 89 banks were reduced to 25 banks that is to say that 64 banks were regarded to be in distressed state. The reason behind this is the inability of regulators to oversee the activities of these Banks. The causes of Bank failures cannot be underestimated hence proper attention should be given to this sector.

Research questions

To what extent does profitability, liquidity, leverage and size affect capital adequacy of deposit money banks listed on the Nigeria stock exchange?

Objective of the study

The major objective of the study is to empirically investigate the determinants of capital adequacy of deposit money banks listed on the Nigeria stock exchange. The specific objectives are to

examine the effect of profitability, liquidity, leverage and size on capital adequacy of deposit money banks listed on the Nigeria stock exchange.

Hypothesis of the study

Ho; profitability, liquidity, leverage and size have no significant effect on capital adequacy of deposit money banks listed on the Nigeria stock exchange.

Significance of the study

The finding of this study will surely enhance the knowledge of researchers and student in management sciences on the relevance of capital adequacy thereby stimulating their interest in this area.

The findings of this study will surely be of an immense benefit to various stakeholders in the banking industry of the Nigerian Economy in general.

Scope of the study

The study covered the sample of ten (10) deposit money banks quoted on the Nigeria stock exchange as at 2022.

Concept of capital adequacy

Capital adequacy is the level of capital required by the bank to enable them withstands the risks such as credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the banks debtors (Vincent & Gemechu, 2013). It refers to the amount of capital that MFI has relative to its asset. Capital adequacy means that there is a sufficient level of capital required to adsorb potential losses while providing financial sustainability (ledgerwood, 1999).

Capital adequacy of banks is defined as the bank's ability to maintain equity capital sufficient to pay depositors whenever they demand their money and still have enough funds to increase the bank's asset through additional lending. Banks lists their capital adequacy ratios in their financial reports. It is stated in terms of equity capital as a percentage of assets. Capital requirements imposed by regulators tend to be simple mechanical rules rather than applications of sophisticated risk models. Regulators endeavour to ensure that financial institutions, banks and investment firms have enough capital to ensure their business remains stable. This measure does not only protect depositors within the industry but also the larger economy as failures of institutions such as banks can have wider scale repercussions. Capital is one of the microfinance bank specific factors that influence the level of profitability of microfinance banks. Vincent and Gemechu (2013) posit that capital adequacy is the level of capital required by banks to enable them withstand the risk such as credit market and operational risk they are exposed to in order to absorb the potential losses and protect the banks debtors. Capital adequacy ratio shows the internal strength to withstand losses during financial crisis.

Concept of profitability

Adeel et al (2012) return on asset implies the amount of profit a firm generates together with its effectiveness with the use of a given resources. Return on asset is the amount of a net income that is received or gained as a percentage of total assets. According to Naeem et al (2014) return on asset calculates how efficiently profits are being collected or generated from the assets employed. Naeem et al (2014) defined return on equity as the amount of net income that is returned or generated as a percentage of shareholder's equity. Return on equity calculate a firm's profitability by investigating how much profit a firm achieve with the money shareholders have invested in the entity thereby making it the most important ratio (Naeem et al, 2014).

Every business is most concerned with its profitability. Profitability is the ability to make profit from all the business activities of an organization, company, entity, firm or an enterprise (Jamali & Asadi, 2012). The main aim of setting up organizations is to make profit and giving back sufficient returns to its shareholders. According to Obehioye, Aderin and Augustine (2013), corporate profitability is defined basically as the degree to which an organization can effectively utilize its available funds and assets, and coverts them into profits. Profitability of an entity enables it to withstand negative shocks and enhance the stability of the business environment. Obehioye et al (2013) posit that the importance of corporate profitability can be appraised at the micro and macro levels of the economy. According to them, at the micro level, profit is the essential prerequisite of a competitive enterprise and the cheapest source of fund. Profitability is therefore a necessity for successful business in this period of growing competition in financial market. The basic motive of any organization is to achieve profit and that is the essential requirement of conducting any business affairs (Bobakova, 2003). It is required that a sound and profitable business environment is achieved through profitability in order to withstand negative shocks and contribute to the stability of business environment at the macro level. The financial performance of firms can be determined by either internal factor such as bank specific determinants or external factors such as industry specific determinants and macro determinants (Njeri, 2014).

Concept of liquidity

Current ratio measures the liquidity level of a firm which is calculated as the ratio of current to current liabilities (Yakubu et al, 2017). Muhammad (2011) opines that companies with more liquidity have more profitability, therefore, liquidity variable has been included as control variable in this study in order to examine its effect on corporate financial performance. Liquidity describes the degree to which an asset or security can be quickly bought or sold in the market at a price reflecting its intrinsic value. In other words: the ease of converting it to cash. Cash is universally considered the most liquid asset, while tangible assets, such as real estate, fine art, and collectibles, are all relatively illiquid. Other financial assets, ranging from equities to partnership units, fall at various places on the liquidity spectrum.

According to Vincent and Gemechu (2013), liquidity is the ability of banks to fulfill its obligations, mainly of its depositors. Liquidity refers to a company's ability to convert its assets into cash in order to pay its liabilities when they fall due. Assets that are expected to turn to cash within one

year are reported on the balance sheet on the section with the heading current assets and are listed in the order in which they are reported to turn to cash which is known as the order of liquidity. Since cash is the most liquid asset, it should appear.

Liquidity according to Wafula (2016) is the term used to describe how easy it is to convert asset to cash. The most liquid asset is cash and it is what everything else can be compared to. Liquidity is also used to determine the financial health of a business or personal investment portfolio. Liquidity is the amount of cash a company has in hand or can generate quickly and reveals how healthy a company is financially. High level of available cash indicates that the business can pay off debts easily when due date occurs. The types of asset a company has and the marketability of those assets are where a discussion of financial liquidity begins. According to Njeri (2014), liquidity of a firm is a key determinant of the firm's financial performance. It is the amount of capital that is available for investment and spending. The International Financial Reporting Standard (2006) defined the concept liquidity as the available cash for the near future, after considering all the financial obligations relating to that period.

Concept of leverage

Leverage results from using borrowed capital as a funding source when investing to expand the firm's asset base and generate returns on risk capital. Leverage is an investment strategy of using borrowed money specifically, the use of various financial instruments or borrowed capital to increase the potential return of an investment. Leverage can also refer to the amount of debt a firm uses to finance assets. When one refers to a company, property or investment as "highly leveraged," it means that item has more debt than equity. According to Adeel et al (2012) leverage implies funds taken from outside parties like banks, capital market, money market and other financial institutions. if a business is leveraged, it means the firm takes loan to purchase assets. Leverage is used to check how much debt or external finance is used (Adeel et al, 2012). According to Joseph and John (2017) leverage describes the amount of liabilities a firm has compared to total asset of the entity. More leverages increases the company's risk of default on repayment of its liabilities.

Leverage refers to the extent to which Microfinance banks borrows money relative to its amount of equity (Ledgerwood, 1999). It is a measurement of the relative level of debt and proxied as total debt to total equity. According to Omondi and Muturi (2013), financial leverage is the proportion of debt to equity in the capital structure of a firm. The decision relating to financing or leverage is a significant managerial decision as it influences the shareholders return and risk and the market value of the firm. It is a measurement of the relative level of debt and proxied as total debt to total equity. Financial leverage relates to an amount of debt that an entity uses in its financial operations. In a bid to avoid using too much equity to fund operations, leverage is employed and an excessive amount of financial leverage increases the risk of failure as it may become more difficult to repay the debt. According to Wafula (2016), financial leverage implies using long-term debt to secure funds for an organization. In the social investment world, it refers to financial participation that encompasses private, individual or public sources. Financial leverage is the degree to which a company uses fixed-income securities such as debt and preferred equity.

The more debt financing a company uses, the higher its financial leverage. A high degree of financial leverage means high interest payment, which negatively affect the company's bottom line earnings per share.

Concept of size

According to Adeel et al (2012) firm size implies the amount of resources a company retains. It is calculated as the log of the total assets (Naeem et al, 2014). According to Muhammad (2011) companies which have more sales naturally have more profitability as well. Therefore, the company size as a variable is used to control the effect of this issue.

In an industry there are firms of varying sizes. The costs of production in these firms of different sizes vary. Economists are concerned with the best size of a business unit, that is, a firm in which the average cost of production per unit is the lowest. But while taking decision about the size of a business unit or scale of operations often the various terms such as the plant or the establishment, the firm and the industry are used in a confused way. To have clear understanding of the concept of the size of a business unit it is advisable to keep in mind the differences between these terms, i.e., the plant, the firm, and the industry. Plant or establishment means a factory, a mill, a shop or an establishment.it refers to a place where goods are produced. The firm refers to the business unit which owns the plant. Industry is wider in coverage than the term firm. It includes all the firms owning, controlling and managing plants engaged in the production of similar products.

Bank size is one of the essential variables in explaining microfinance bank's sustainability and a number of studies have tried to explore the influence of size on profitability but their result however, have been inconsistent and controversial. Size of microfinance bank in this study is measured by (the natural log of total assets) to examine the impact of firm size on financial sustainability of microfinance banks. According to Shaheen and Malik (2012), Size of a firm is the quantity and array of production capability and potential a firm acquires or the quantity and diversity of services a firm can render to its clients. Large firms can manufacture products on much lower costs compare to smaller firms. Modern firms increase their size so as to gain competitive edge on their competitors by lowering production cost and increases their market share (Akinyomi & Olagunju, 2013).

Empirical review

Profitability and capital adequacy

Agbeja, Adelakun and Olufemi (2015) examined the relationship between profitability and capital adequacy in Nigeria. Data required for this study were secondary and sourced from Central Bank of Nigeria Statistical Bulletin and Annual Financial Reports of the selected banks. The data collect from the covers the period of 2010-2014 reporting years only. Therefore, from the population of commercial banks in the country (i.e. 24 banks) only five selected banks were used based for this purpose. The banks are: - United Bank of Africa (UBA) Plc, First Bank of Nigeria (FBN) Plc, Access Bank Plc, Zenith Bank Plc, GTBank Plc and WEMA Bank Plc. The variables to be tested

in the hypotheses are; capital adequacy ratio and bank profitability capital adequacy will be measured by using the amount of equity capital the selected bank's hold as reserve as proxy, profitability will be measured by using profit after tax of the selected bank The regression analysis was employed as tool to empirically test for correlational relationship among the variables of interest the findings of the study indicates that there is a significant relationship between profitability and bank's capital adequacy.

Liquidity and Capital Adequacy

Daniel (2015) examined the effects of liquidity of commercial banks on capital adequacy requirements in Kenya. The study used data from secondary sources. The data for the banks was extracted from the banks' annual reports and financial statements for the period 2010-2014. This was obtained from the banks supervision department of the Central Bank of Kenya. Data collected was in areas of; capital adequacy ratio, growth rate (GDP) and bank size taking into account the total asset base of the bank which are the independent variables while liquidity as the dependent variable was also collected. Data on liquidity was obtained from banks' Statement of Financial Position. The data collected was analyzed using descriptive statistics, correlation, and linear regression analysis. In addition to the comparative analysis, the study examined the relationship between dependent variables (liquidity) and the independent variables (capital adequacy). Statistical Package for Social Scientists (SPSS) was used as a tool to help analyze the data. The finding of the study indicates that liquidity has significant effect on capital adequacy.

Leverage and Capital Adequacy

Shirley and Su-chu-Hsu (2010) examine the relation between firms' financial leverage and capital adequacy in Taiwan's banking industry. Regressions cover two sub periods: before the first financial reform (1996–2000) and after the first financial reform (2001–2006), to address the impacts of the first financial reform on banking firms' financial structures. Our result demonstrates that the leverage is positively related to capital adequacy.

Size and Capital Adequacy

Masood and Ansari (2016) investigated the determinants of capital adequacy of Pakistan banking sector.This study analysed the bank specific factors which had an impact on the determination of Capital Adequacy Ratio (CAR). The impact of bank size, ROA(Return on Assets), ROE (Return on Equity) was analysed by using Fixed Effect Method and the validity was tested by Hausman test. The results proved that Random Effect Model is better suited in this case. The data of 14 Pakistani Commercial Banks which were included in the KSE (Karachi Stock Exchange) 100 Index was gathered for the period 2008-2014. The results revealed that the Size of the Bank and ROA had no impact on CAR

Theoretical framework

2.3.1 Modigliani and Miller Capital Structure Theory
Miller and Modigliani (1958) were the proponents of the theory. The theory assumes a perfect market and states that the value of the company is independent of its capital structure. That is, it

doesn't matter how a firm finances its operations and therefore the value of the firm is not dependent on its capital structure, hence capital structure is irrelevant. The theory is based on the assumption that there are no taxes, no transaction costs, no bankruptcy costs, there is equivalence in borrowing costs for both the investors and companies such that investors can borrow at the same rate as corporates, companies and investors have the same information such that there is no informational asymmetry and that there are no effect on a company's earnings before interest and taxes. The theory further states that the market value of a firm is determined the risk of it underlying assets and more so by the firm's earning power. The firm value therefore is totally independent of the way the firm finances its investment activities and pays out dividends (Oghenekohwo, Nkeiruka & Nnenna, 2015). The second proposition by Modigliani and Miller (1963) brought about the trade-off theory that incorporates bankruptcy costs. The authors argued that there is a tax benefit associated with debt financing and there was also the cost of debt that they termed the bankruptcy cost of debt. Under the new proposition otherwise called trade-off theory, it was argued that the marginal benefit of increases in debt reduces while the marginal cost increase. As such, the firm that maximized its overall value would consider to trade-off between equity and debt while financing. The assumptions of the first proposition of the Miller-Modigliani theorem doesn't hold in the real world and has spurred the development of other theories such pecking order and agency theories that address the shortcomings of Miller-Modigliani theorem.

Market Power Theories

The market power hypothesis has been used to explain bank performance. The theory posits that the performance of a bank is largely influenced by the market structure of the industry. According to the theory, there are two separate approaches that are Structure-Conduct Performance (SCP) and Relative Market Power (RMP). The SCP hypothesis contends that the high level of market concentration is the source of market power (Smirlok 1985). As such, the high concentration of banking institutions in the banking market gives rise to market power by banks. Thus, the banking institutions in more concentrated markets are more likely to make abnormal profits. This is ascribed to their ability to give loan on higher interest rates and accept deposit at lower interest rates due to monopoly than firms in less concentrated markets despite their efficiency (Tregenna, 2009).

However, critics contend that the direct source of market power emanates from the domination of participants in the individual market irrespective of the source of domination and hence the emergence of RMP (Shepherd, 1986).According to RMP hypothesis, banks with large market share and diversified products exert their market power and therefore influence prices and thus make huge profits. In line with the hypothesis, individual market shares determine market power and market imperfections (Mensi & Zouari, 2010). Indeed, according to Tregenna (2009) banking institutions are able to exert market power and thus earn non-competitive profits. The theory serves best to explain profitability of microfinance institutions. MFIs commanding large market share and more so with diversified products are able to make huge profits since they can influence the prices of their products such as loans based on elasticity of demand due to alterations in prices.

RESEARCH METHODOLOGY

Research Design

This research work utilizes descriptive research design using cross-sectional panel data covering five years spanning from 2014 to 2018 to explore the effect of profitability, liquidity, financial leverage and firm size on the capital adequacy of deposit money banks listed on the Nigeria stock exchange.

population and sample size

Population parameter of the study are the twenty two deposit money banks listed on the Nigeria stock exchange with purposive sampling technique applied to arrive at sample size of ten deposit money banks with consistent data set covering the study period of 2014 to 2018

Sources of Data Collection

Data for the study consisting of annual financial statements were collected from the Nigeria stock exchange fact books for the period 2014 to 2018

Techniques of data analysis

Data collected were analysed with the aid of ordinary least square regression analysis through the use of e-views software

Model Specification

CADE = f(roa, liq, lev siz)

$CADEit = \beta_1 ROAit + \beta_2 LIQit + \beta_3 LEVit + \beta_4 SIZit + \varepsilon t$

Where;

CADE = capital adequacy

ROA = return on asset

LIQ = liquidity

LEV = leverage

SIZ = size

Et = error term

Variable	measurement
Capital Adequacy	**Equity capital to total asset**
Profitability	**Return on asset**
Liquidity	**Cash and short-term funds to total asset**
Leverage	**Debt to asset**
Firm size	**Log of total asset**

DATA PRESENTATION AND ANALYSIS

Data Presentation

In this section, reference is made to the data collected in relation to the study variables ranging from capital adequacy, profitability, liquidity, leverage and bank size. These data are attached as appendices 1-8.

Descriptive Statistics

	CADE	ROA	LIQ	LEV	SIZ
Mean	0.113000	0.069800	1.045400	0.651400	1.303200
Median	0.080000	0.020000	1.110000	0.455000	0.860000
Maximum	1.970000	1.390000	2.110000	5.440000	3.620000
Minimum	-0.370000	-0.110000	0.050000	0.000000	0.110000
Std. Dev.	0.413508	0.277169	0.503855	1.013972	0.982983
Skewness	3.585793	4.424680	-0.132071	4.301631	0.749070
Kurtosis	17.11282	21.45483	2.516433	20.73943	2.356248
Jarque-Bera	522.0903	872.6917	0.632517	809.7989	5.539249
Probability	0.000000	0.000000	0.728871	0.000000	0.062686
Sum	5.650000	3.490000	52.27000	32.57000	65.16000
Sum Sq. Dev.	8.378450	3.764298	12.43964	50.37880	47.34649
Observations	50	50	50	50	50

Source: Researcher's computation using E-Views 9

Table 4.1 is the Descriptive Statistics with respect to CADE, ROA, LIQ, LEV and SIZ. The table describes the variables in terms of their Mean, Maximum, Minimum, Standard Deviation and Obs. It is evident from the result that, the mean scores in relation to CADE, ROA LIQ LEV and siz 0.113000, 0.069800, 1.045400, 0.651400 and 1.303200 respectively. The maximum values which represent the largest data values in each of the variables and their corresponding minimum values representing the smallest data values are CADE: has maximum of 1.970000 and a minimum of -0.370000, ROA has maximum of 1.390000 and a minimum of -0.110000, LIQ has a maximum of 2.110000 and a minimum of 0.050000, LEV has a maximum value of 5.440000 and a minimum value of 0.000000, SIZ has a maximum value of 3.620000 and a minimum value of 0.110000

4.2 Data analysis and Result

4.2 Correlation Matrix

Covariance Analysis: Ordinary
Date: 03/14/20   Time: 18:10
Sample: 2014 2018
Included observations: 50

Correlation Probability	CADE	ROA	LIQ	LEV	SIZ
CADE	1.000000				

ROA	0.977559	1.000000			
	0.0000	-----			
LIQ	0.089488	0.017033	1.000000		
	0.5366	0.9065	-----		
LEV	-0.017494	-0.052617	0.119219	1.000000	
	0.9040	0.7167	0.4096	-----	
SIZ	-0.375496	-0.265965	0.035323	-0.131160	1.000000
	0.0072	0.0619	0.8076	0.3639	-----

Source: Researcher's Computation using E-Views 9

Table 4.2 represents the correlation matrix in relation to the study. The table depicts a positive and significant correlation between ROA and CADE. There is insignificantly positive correlation between LIQ and CADE while negative and insignificant correlations are found between LEV and CADE. Significantly negative correlations are found between SIZ and CADE.

4.3 Panel Regression Analysis

Dependent Variable: CADE
Method: Panel EGLS (Two-way random effects)
Date: 03/14/20   Time: 18:17
Sample: 2014 2018
Periods included: 5
Cross-sections included: 10
Total panel (balanced) observations: 50
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.017472	0.026832	0.651177	0.5182
ROA	1.404683	0.035939	39.08555	0.0000
LIQ	0.063655	0.018966	3.356248	0.0016
LEV	0.002114	0.009632	0.219523	0.8272
SIZ	-0.054052	0.010197	-5.300611	0.0000

Effects Specification		S.D.	Rho
Cross-section random		0.000000	0.0000
Period random		0.013620	0.0419
Idiosyncratic random		0.065119	0.9581

Weighted Statistics			
R-squared	0.975908	Mean dependent var	0.094249
Adjusted R-squared	0.973766	S.D. dependent var	0.408854
S.E. of regression	0.066221	Sum squared resid	0.197337
F-statistic	455.7078	Durbin-Watson stat	1.853979
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.976074	Mean dependent var	0.113000
Sum squared resid	0.200460	Durbin-Watson stat	1.890018

Source: Researcher's computation using E-views 9

Table 4.3 is the random effect regression result. The line of the regression is CADE = 0.017472 + 1.404683ROA + 0.063655LIQ + 0.002114LEV - 0.054052SIZ, and this depicts that, Capital adequacy increases with increase in profitability, liquidity and leverage but decreases with increase

in size. The respective P-values except for LEV indicate significant effects on CADE. This implies that, CADE is not majorly influenced by LEV. However, the result depicts the serious influence of ROA LIQ and SIZ. This means that capital adequacy is a product of profitability, liquidity and siz. The R-Square of 0.975908 indicates that, about 98% of variation in CADE of deposit money banks listed on the Nigeria stock exchange can be explained by ROA, LIQ, LEV and SIZ. The remaining 2% can be explained by other variables that are not captured in the regression line (error term). The F-statistics and its probability value of 0.000000, which is less than the t-value of 0.05 depicts the fitness of the model.

4.3 Discussion of finding

The study employed panel regression for analysis and found out that, profitability, liquidity and size have significant effect on the capital adequacy of deposit money banks listed on the Nigeria stock exchange. This implies that, the ability of capital to be adequate is attributable to profitability, liquidity and size while leverage has no significant effect on capital adequacy. Based on the findings of the study, it is concluded that, deposit money banks are not making the best use of the financial leverage to build up capital requirement. More so, the study concludes that, deposit money banks tends to collect external debt without minding the cost of capital which is usually high compare to internal source. This is sufficed to say that the debt capital raised by deposit money banks do have high interest rate that affect the capital requirement adversely.

Summary

This study examined the effects of profitability, liquidity, leverage and size on capital adequacy of deposit money banks listed on the Nigeria stock exchange. The study employed panel regression for analysis and found out that, profitability, liquidity and size have significant effect on the capital adequacy of deposit money banks listed on the Nigeria stock exchange. This implies that, the ability of capital to be adequate is attributable to profitability, liquidity and size while leverage has no significant effect on capital adequacy.

Conclusion

Based on the findings of the study, it is concluded that, deposit money banks are not making the best use of the financial leverage to build up capital requirement. More so, the study concludes that, deposit money banks tends to collect external debt without minding the cost of capital which is usually high compare to internal source. This is sufficed to say that the debt capital raised by deposit money banks do have high interest rate that affect the capital requirement adversely.

Recommendations

The finding from the study also revealed that financial leverage has no significant effect on capital adequacy of deposit money banks listed on the NSE. Therefore, management and governing board of deposit money banks should also ensure that all means of raising internal capital for the activities of the banks are exhausted before thinking of other means of raising funds (external sources).

The finding from the study also revealed that liquidity has significant effect on capital adequacy of deposit money bank listed on the NSE. Deposit money banks should make effective and efficient use of their cash and cash equivalent in meeting the liquid needs of their customers. They should make sure that customers are given adequate attention when they come to the bank for any withdrawal or short-term loans and advances to meet their needs.

The finding from the study revealed that profitability has a significant effect on capital adequacy of deposit money banks listed on the NSE. Management of deposit money banks should make collective effort to ensure that profitability growth is maintained perpetually as profitability is significant to the adequacy of capital.

The finding from the study also revealed that bank size has significant effect on the capital adequacy of deposit money banks listed on the NSE. Deposit money banks should make efforts towards ensuring that their total assets (current and non-current) increase to make them more steadfast to tackle issues when they crop up thereby increasing the financial performance of the bank. This enhances the movement of the deposit money banks towards expansion and growth.

Limitations of the study

In conducting this study some limiting factors were duly considered such as inaccessibility to the required statistical data which were proved confidential and for the fact that data obtained are unable to cover longer period and wider coverage to have a more robust statistical analysis.

Further study can be carried out on the determinants of capital structure. Study can also be conducted on the determinants of leverage.

The study utilized five years spanning through 2014 to 2018 because of the fact that statistical data are not easily accessible. Further study can adopt 10 years or more. This study measured bank size as the natural log of total asset. Further study can be carried out measuring bank size as natural log of total employees or fixed asset divided by total asset. This also includes measuring the remaining other variables used in this study but of different measurement to indicate the uniqueness of the study.

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