Capital Adequacy Ratios and Real Sector Investment of Quoted Commercial Banks in Nigeria

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Abstract

This study examined the effect of capital adequacy ratios and real sector investment of quoted commercial banks in Nigeria. The objective was to study how capital adequacy ratios affect real investment of quoted commercial banks. Cross sectional data were sourced from financial statements of the quoted 15 commercial banks. Multiple regression were formulated having real sector investment as dependent variable while Tier one capital ratio, Tier two capital ratio, Capital to deposit ratio and Capital to risk assets ratio. Statistical Package for Social Sciences SPSS version 25 was used to analyze the quantitative data and test their reliability. The study found that 0.05 significance level, Tier one capital has positive but no significant effect on real sector investment of the quoted commercial banks (β = . 1.683, t = 1.168, p = . 266). Tier two capital has positive but no significant effect on real sector investment of the quoted commercial banks (β =.370, t = 1.398, p = .187). Capital to total loans has positive and significant effect on real sector investment of the quoted commercial banks (β =..446, t = 1.981, p = .041). Capital to total deposit has positive but no significant effect on real sector investment of the quoted commercial banks (β =.18.525t = 1.463, p = .169). From the findings, the probability value corresponding to Tier one capital adequacy ratio .215 greater than 0.05, the study conclude that Tier one capital ratio has no significant effect on real sector investment of quoted commercial banks in Nigeria. The probability value corresponding to Tier two capital adequacy ratio .259 greater than 0.05, the study conclude that Tier two capital ratio has no significant effect on real sector investment. From the findings, the probability value corresponding to capital to total loan capital adequacy ratio .041 less than 0.05, the study conclude that Capital to deposit ratio has significant effect on real sector investment. The probability value corresponding to capital to total loan capital adequacy ratio .119 greater than 0.05, the study conclude that Capital to total deposit ratio has no significant effect on real sector investment of quoted commercial banks in Nigeria. The study recommends that quoted commercial banks increase and sustain their tier one capital to drive up real sector investment.

Keywords: Capital Adequacy Ratios, Real Sector Investment, Commercial Banks, Nigeria

INTRODUCTION

Investment models have long ignored relevant features of investment behaviour, namely that investment expenditure may be irreversible and investors may decide to delay in investing their money if they perceive that there is uncertainty surrounding market indicators such as prices of goods, costs of inputs and others factors that are relevant for economic agents to take investment decision (Jorgenson(1971). Different investment models have been developed to evaluate investment since it is perceived that when investment projects are correctly valued, it

will assist investors in making correct decisions which could help the firm to make workable financial commitments for the survival of the firm through the channel of profitability or value creation. The real sector comprising agricultural, commercial, and industrial activities of a nation is often financed by bank credit. Without adequate financing, there can be no growth or maintenance of stable output. Thus, the bank credit influences total macroeconomic environment by affecting money supply, investment, total output, and employment. In order to remain stable and profitable, companies need to mix both debt and equity strategically for the purpose of achieving an optimum capital structure. Banks promote economic growth through the process of financial intermediation by efficiently allocating funds mobilized from the surplus economic units to deficit units. This function, therefore, suggests that financial intermediation could serve as a catalyst for economic growth and development (Korkmaz, 2015, Hossain, Islam, Mahmud, & Islam, 2017). The intermediate functions of commercial banks can promote real and portfolio investment in the economy while effect intermediation of commercial banks as the function of capital adequacy.

The capital of a firm comprises of level (tier) one; (core) capital that can absorb losses and, level two (supplemental) capital that absorbs losses in case of dissolution to provide a smaller amount of protection to the account holders (Follain, 2013). Besides, the assets of commercial banks have varied risk profiles and thus different risk weighting. Capital adequacy ratio adjusts for the assets that are not as risky by permitting the commercial banks to reduce lower risk assets (Liao, 2013). The Basel Capital Accord of 1988 (Basel I) facilitated the endorsement of the new capital adequacy system in 2004 which signified the start of another period of new regulations to bring the universal harmonization of banking protocols (Mugwang'a, 2014). This was also done in order to advance proficiency in the banking business after a significant time of overall deregulation and progression (Ongore & Kusa, 2013). The Basel accord expects banks to appropriately attend to the risk they take in order to cushion the economy from destabilization as a result of weak banking systems. Saona (2011) further suggests that the existence of banking regulations to a large degree determines the capital structure decision-making procedures resulting in the profitability and efficiency of banks.

Capital adequacy is the level of capital necessary for a bank as determined by the regulatory and supervisory authorities to assure the banks financial health and soundness. Capital adequacy, the measure of the solvency of a bank, tells whether a bank has enough capital to support the risks in its balance sheet. Adequate capitalization is an important variable in business, and is more so in the business of using other peoples' money such as banking. According to Onoh (2002), bank capital is considered adequate if it is enough to cover the banks operational expenses and protect depositors against total or partial loss of deposits in the event of liquidation or loss sustained by the bank. Prudential guidelines on capital adequacy sets out the three main elements that determine a bank's capital adequacy, these are: credit risk associated with exposures; market risk arising from banking activities and the form and quality of capital held to support these exposures. Since the banking sector plays vital roles in an economy, the question that then avoid is its efficiency and operational mechanism. More specifically, how should the banking sector operate: under a controlled or a market- based framework (Izevbigie & Arodoye, 2016).

Capitalization is an important component of reforms in the Nigerian banking industry, owing to the fact that a bank with a strong capital base has the ability to absolve losses arising from

non-performing liabilities. Attaining capitalization requirements may be achieved through consolidation of existing banks or raising additional funds through the capital market. The primary goal of recapitalization exercises in Nigeria has been to guarantee an efficient and sound financial system. The reforms are designed to enable the banking system develop the required flexibility to support the economic development of the nation by efficiently performing its functions as the pivot of financial intermediation (Lemo, 2005). In Nigeria, one of the achievements in the financial industry has been the upward audit of the capital base of commercial banks. This supports banking operations by offering a buffer to absorb unforeseen misfortunes from its activities thus empowering the commercial bank to keep on working in a sound and practical manner while the issues are being settled or attended to (Nestor, Leonard, & Okoye, 2017). An ideal measurement of the capital strength of any commercial bank is the capital adequacy ratio, which is the amount of commercial bank's legally required capital expressed as a percentage of the risk-weighted assets. Prudential rubrics on capital adequacy sets out three significant components that determine a commercial bank's capital adequacy; these are; exposure adjusted credit risks, banking activities market risks, and the structure and nature of capital held in supporting these exposures (Okafor, Russell, & Lawal, 2012).

With the prevailing economic recession in the country, there has been lower investment in the agriculture, manufacturing, industrial and financial sectors. Despite 4 the better performance of commercial bank, there are still problem, which need to be resolved. Every business form can take advantage through appropriate capital mix because long run profitability depends on its capital structure besides other factors. Adequacy of capital is among the most regulated aspect in the banking industry across the globe with an emphasis on making sure that commercial banks have enough capital to compensate for risks they are exposed to (Aliyu, Yusof, & Naiimi, 2017). Capital adequacy has an impact on stakeholder trust and confidence towards the company and it is among the fundamental parameters of gauging the commercial banks' performance (Pellegrina, 2012). There, however, lacks consensus among empirical studies on the influence of capital adequacy on listed commercial banks' financial performance as studies present conflicting findings. There is still divergence of opinion, amongst researchers, analysts and bank regulators, on the efficiency of the formalized capital adequacy requirement decades after its adoption following the first Basel Accord of 1988. While some are of the view that the framework helps strengthens the banking system stability and soundness, as well as reduce competitive inequality, others opined that it has the capability of impacting negatively on intermediation that could lead to credit crunch with the consequences of declining output (BCBS, 1999). The advocates of capital adequacy requirement usually support their argument with the surge in risk-based capital ratios in developed countries few years after the adoption of the Basel 1 Accord.

Opponents, on the other hand, argued that the rise in capital adequacy requirement could be a function of adjustment in the denominator risk weighted assets or a consequence of market discipline. They supported their argument with the coincidental decline in output in the industrialized countries of the world during the period of improved capital adequacy requirement. For instance it acknowledged by Akani and Lucky (2016) that a bank can be capitally adequate but if poorly managed will failed its primary intermediation functions and affect negatively real sector investment. This was the case of Nigeria less than five after the 1150 percent increase in capital base from 2 billion to 25 billion Naira. There are many studies on commercial banks capital adequacy, most of the studies focused on capital adequacy and

performance of the banking institutions. Leesi (2021) developed a stress test framework that facilitates the analysis of the direct effects of monetary policy shocks on the asset quality of Nigeria commercial banks and feedback effects of assets quality on monetary policy variables using causality test, Farayibi (2016) examined stress testing in the Nigerian banking sector from 2004-2014 using error correction mechanism (ECM) and Ordinary Least Square (OLS) methodologies, Orobah and Anwarul (2020) examined the literature on financial stability implication of stress testing for risk-taking and credit growth in banks while Ikpefan (2013) examined the impact of capital adequacy, management and performance of Nigerian commercial banks from 1986 – 2006 using time series data obtained from Central Bank of Nigeria statistical bulletin and Annual financial statement of sampled banks. This study focused capital adequacy and real sector investment of quoted commercial banks in Nigeria.

LITERATURE REVIEW

Concept of Capital Adequacy

Capital adequacy can be defined as the sum of the bank's paid-up share capital and its accumulated capital reserves. This capital is important for the protection of bank depositors and for the maintenance of public confidence in the operations of the bank. Regulators view capital as a necessary buffer to absorb possible losses before such losses will be charged against deposits. Regulatory capital is the amount of capital required by regulators or considered adequate to ensure a safe and sound banking system. The Basel capital accords envisages that the higher the risk of loss, the higher the qualifying capital base of banks to maintain the stipulated capital adequacy ratio (Casu, Girardone & Molyneux, 2006).

Kishore (2007) views capital adequacy as the quantum of fund which a financial institution should have and plan to maintain in order to conduct its business in a prudent manner Adequate is regarded as the amount of capital that can effectively discharge the primary function of preventing banking industry's failure by absorbing losses. It is seen as a way of providing the ultimate protection against insolvency arising from the risk in the banking sector. It is the least amount necessary to inspire and sustain confidence in the banks, (Akintoye & Somoye, 2008). According to Jensen and Mark (1997), capital adequacy refers to a relative measure which establishes the maximum level of leverage that a financial institution is allowed to reach on its operations. It is measured by the ratio of risk weighted assets relative to regulatory equity, which has been internationally recommended to be equal to 12.5 times, or commonly known as a capital adequacy of 8%.

Capital is adequate either when it reduces the chances of future insolvency of an institution to some predetermine level of alternately when the premium paid by the banks to an insurer is 'fair', that is, when it fully covers the risks borne by the insurer. Such risks, in turn, depend upon the risk in the portfolio selected by the bank, on its capital and on term of the insurance with respect to when insolvency will be determined and when loss will be paid." (Maisel, 1982) Rosenbergas (1982) has defined capital in relation with banking as a long-term debt plus owner's equity. The efficient functioning of markets requires participants to have confidence in each other's stability and ability to transact business. Patheja (1994) has 11 defined banks capital as common stock plus surplus undivided profits plus reserves for contingencies and other capital reserves.

Nzotta (2004) noted that to a very large extent, the strength of a bank depends on the capital funds available to it. A bank's capital can be defined as the equity value of a bank equated to the present value of its future net earnings. Generally, banks capital represents the owners' net worth in a bank and it includes the pay in capital and all additions to the capital resources of the bank. Bank capital also ensures the safety of a bank, it helps the bank to avoid the risk of insolvency, and also to support the credit risk a bank is called upon to assume in a normal business leading. Here, the larger the capital resources, the more loans and advances the bank could grant both on the aggregate and for single individuals. A bank's capital resources help the supervisory authorities in assessing the adequacy of its capital in relation to its loans and investments. Therefore, capital adequacy represents the amount of capital resources needed by banks for its operations, consistent with the amount of risks and risk assets it is assuming. Capital adequacy is the level of capital necessary for a bank as determined by the regulatory and supervisory authorities to assume the banks financial health and soundness.

Capital adequacy, the measure of the solvency of a bank, tells whether a bank has enough capital to support the risks in its balance sheet. Adequate capitalization is an important variable in business, and is more so in the business of using other peoples' money such as banking. Adequate capital is required to the efficient operating and functioning of the firm in the modern competitive environment, is always the matter of controversial debate. In one hand holding excess capital keeps the firm in low profit position, on the other hand inadequate capital limits the firm to meet the public demand of loan and low earning capacity. Capital adequacy aims at setting minimum level of capital as a function of risks. Thus capital should be risk base, (NRB Directives, 2004) Capital adequacy is one of the bank specific factors that influence the level of bank profitability. Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation (Athanasoglou 2005). Banks capital creates liquidity for the bank due to the fact that deposits are most fragile and 12 prone to bank runs. Moreover, greater bank capital reduces the chance of distress (Diamond, 2000).Capital Adequacy reflects the overall financial condition of the banks and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected losses.

Capital Adequacy ratios act as indicators of banks' leverage (Chishty, 2011). Capital Adequacy Ratio (CAR) shows the banks' ability to maintain sufficient capital. The main activity of the bank is to collect funds and channel them back in the form of loans. If a bank has enough capital or meet the requirements, it can operate to create profit. In addition, the bank can provide large loans and it has enough assets as collateral for third party funds deposited in the bank so that it will increase public trust. The higher the CAR better the performance of a bank. This is supported by Saeed (2014).Capital Adequacy is important for a bank to maintain depositors' confidence and preventing the bank from going bankrupt. Capital is seen as a cushion to protect depositors and promote the stability and efficiency of financial system around the world, Khalid (2015).

Capital Adequacy Ratio

Since Capital adequacy ratio (CAR) is the ratio that is set by the regulatory authority in the banking sector, and this ratio can used to test the health of the banking system. Hence, capital adequacy ratio for banking organizations is an important issue that has received a considerable attention in finance literature. According to Al-Sabbagh (2004), capital adequacy is defined as

a measure of bank's risk exposure. Banks risk is classified into credit risk, market risk, interest rate risk and exchange rate risk that are included in the calculation of capital adequacy ratio. Therefore regulatory authorities used capital adequacy ratio as an important measure of safety and soundness for banks and depository institutions because they view capital as a buffer or cushion for absorbing losses.
CAR also called Capital to Risk (Weighted) Assets Ratio (CRAR) is a ratio of a bank's capital to its risk. It is a measure of the amount of a bank's core capital expressed as a percentage of its 10 risk-weighted asset (Berger et al., 1995). The NBE keep track of a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements as these ratios are a measure of the amount of a bank's capital in relation to the amount of its credit exposures. They are usually expressed as a percentage. For instance, a capital adequacy ratio of eight (8) percent means that a bank's capital is eight percent of the size of its credit exposures (Alfon et al., 2004). The purpose of having minimum capital adequacy ratios is to ensure that banks can absorb a reasonable level of losses before becoming insolvent, and before depositors funds are lost (Harley, 2011).

Applying minimum capital adequacy ratios serves to promote the stability and efficiency of the financial system by reducing the likelihood of banks becoming insolvent. A bank becoming insolvent may lead to loss of confidence in the financial system, causing financial problems for other banks and perhaps threatening the smooth functioning of financial markets (Soludo, 2009). Therefore, the application of minimum capital adequacy ratios by the central bank assists in maintaining a sound and efficient financial system. It also gives some protection to depositors. In the event of a winding-up, depositors' funds rank in priority before capital, so depositors would only lose money if the bank makes a loss which exceeds the amount of capital it has. Hence, Alashi (2002) observed that the higher the capital adequacy ratio, the higher the level of protection available to depositors.

The capital adequacy principle states that bank's capital should match risks. Since capital is the most scarce and costly resource, the focus of risk monitoring and risk measurement follows. The central role of risk-based capital in regulations is a major incentive to the development of new tools and management techniques. Undoubtedly a most important innovation of recent years in terms of the modelling toolbox is the VaR concept for assessing capital requirements. The VaR concept is a foundation of risk-based capital or, equivalently, economic capital (Bessis 2002). The VaR methodology aims at valuing potential losses resulting from current risks and relies on simple facts and principles. VaR recognizes that the loss over a portfolio of transactions could extend to the entire portfolio, but this is an event that has a zero probability given the effective portfolio diversification of banks. Therefore, measuring potential losses requires some rule for defining their magnitude for a diversified portfolio. VaR is the upper bound of losses that should not be exceeded in more than a small fraction of all future outcomes. Management and regulators define benchmarks for this small preset fraction, called the confidence level measuring the appetite for risk of banks. Economic capital is VaR based and crystallizes the quantified present value of potential future losses for making sure that banks have enough capital to sustain worst-case losses. Such risk valuation potentially extends to all main risks.

The "Basel Committee" established in 1974, is a committee that represents central banks and financial supervisory authorities of the major industrialized countries (the G10 countries). The

committee concerns itself with ensuring the effective supervision of banks on a global basis by setting and promoting international standards. Its principal interest has been in the area of capital adequacy ratios. In 1988 the committee issued a statement of principles (Basel Capital Accord) dealing with capital adequacy ratios. The statement contains a recommended approach for calculating capital adequacy ratios and recommended minimum capital adequacy ratios for international banks. The Accord was developed in order to improve capital adequacy ratios (which were considered to be too low in some banks) and to help 12 standardize international regulatory practice. This Accord has been adopted by the OECD countries and many developing countries (Basel Committee on Banking Supervision, 2003).

Minimum capital adequacy ratios and its limitations The minimum CAR that supervisory authorities are encouraged to apply according to the Basel Capital Accord are: one, that tier 1 capital to total risk weighted credit exposures should not be less than 4 percent; and: two, that total capital (i.e. tier 1 plus tier 2 less certain deductions) to total risk weighted credit exposures should not be less than 8 percent. Akerlof (1990) observed that having a CAR above the minimum recommended level is not a guarantee that the bank is "safe" as CAR are concerned primarily with credit risks. There are also other types of risks which are not recognized by CAR, for instance inadequate internal control systems could lead to large losses by fraud, or losses could be made on the trading of foreign exchange and other types of financial instruments. Furthermore, CARs are only as good as the information on which they are based. For instance, if inadequate provisions have been made against problem loans, then the CAR will overstate the amount of losses that the bank is able to absorb. Therefore, CAR should not be interpreted as the only indicators necessary to judge a bank's financial soundness.

Introduction to 1988 Basel Accord Basel committee for banking regulations and supervisory practices has been established in 1988. The committee consisted of representatives of the group of ten (G-10) countries which are Canada, France, Germany, Italy, Japan, Sweden, Switzerland, United Kingdom, and United States. The heads of central banks of G-10 countries had met in 7-December 1887 at Basel city to study the first report of Basel committee which tries to establish equilibrium between rules and regulatory actions about measuring the adequacy of capital. So the report has been published and distributed to the G-10 countries and another countries, to let banks study it for a period of 6 months and to look at the committee and put their final report and presented it in July 1988 which has been agreed upon by the heads of the central banks and was called (Basel accord). The major objective of Basel committee is to reduce fragility of international banking system, and to reduce competitive inequities created by the application of differential standards at the national level (Cornford 2003). 1988 Capital Accord specified a board range of principles to govern the division of supervisory responsibilities between parent and host banking supervisory authorities in G-10 countries. It was last amended in 1983 and is widely applied today in financially developed countries.

Measurement of Bank Capital Adequacy Ratio

Traditionally, bank capital is measured by Capital Assets Ratio (CAR). The banking sector crisis prior to the establishment of Nigerian Deposit Insurance Corporation (NDIC) may have been examined using this ratio.

Capital to Deposit Ratio: The banking Act of 1969 provided that the paid-up capital and statutory reserve of banks operating in Nigeria should not fall below 10% of a bank's total deposit. It is expected that for every unit of 10 deposit liabilities there should be at least 1 unit

of bank Capital for the protection of the deposit. There has been criticism about this ratio. Opponent of the ratio argued that it will lead to fall in the operating profit of the banks as significant proportion of the bank's capital will held in idle cash or near cash which is low interest income. The principle of striking balance between liquidity, safety and liquidity by banks would not be achieved if higher level of cash or near cash instruments were kept by banks.

Equity Capital- Total Assets Ratio: The ratio of equity capital or primary capital to total assets is another good measure for the capital adequacy of banks. A high ratio position the bank in a better measure to absorb shocks in the operating environment.

Capital to Risk Assets Ratio: Bank operation and the operating environment is characterized with risk, this ratio measures the depth of exposure of a bank to risk assets and the number of times risk assets can be covered by capital, the higher the ratio of risk assets to total capital, the worse the capital adequacy disposition of the bank.

Adjusted Capital to Risk Assets Ratio: This ratio is used to measure the strength of adjusted capital to risk assets of the bank. Adjusted capital is defined as: Total Capital (AC) - (55% Bank Premises) Risk Assets (R.A) is calculated as: Total Assets - (Liquid Assets + 55% Bank premises) Therefore AC – RA Ratio = TC – (55 BP)
TA – (LA + 55 BP)

Adjusted Equity Capital to Risk Assets Ratio: This is the variant of the adjusted capital to risk assets ratio. It indicates the extent to which a unit of adjusted equity capital is able to cover a unit or units of risk assets at a given period of time. Adjusted equity capital is defined as: Total Capital - (Subordinated notes + debentures + 55% Bank premises).

Capital to Weighted Risk Assets: Bank assets differ and the degree of risk also differs. Appropriate weight can be assigned to match each class of bank assets according to the perceived degree of risk exposure of the assets with the assets quality. This was adopted by the Basle of International settlement to determine the standard of Bank capital adequacy.

Capital -Net Loans and Advances Ratio: This measures bank capital to loans and advances in the banking system. This rating is influence by the monetary and macroeconomic condition of the country.

The Basel Capital Accord

Tier 1 Capital This includes only permanent shareholders' equity (issued and fully paid ordinary shares/common stock and perpetual non-cumulative preference shares) and disclosed reserves (created or increased by appropriations of retained earnings or other surpluses). In the case of consolidated accounts, this also includes minority interests in the equity of subsidiaries which are not wholly owned. This basic definition of capital excludes revaluation reserves and cumulative preference shares. There is no limit on the inclusion of Tier 1 capital for the purpose of calculating regulatory capital. For this purpose, the equity shares with the following characteristics are included in Tier 1 capital: Issued directly by the bank;

i. Clearly and separately identified in the balance sheet –
ii. Have no maturity (are perpetual);
iii. Fully paid;
iv. Cannot be refunded beyond the possibility of the liquidation of bank or reduction of share capital;
v. Do not give to the holder rights to a minimum remuneration nor are there any clauses that require the compulsory payment of dividends.

vi. The dividends are paid solely out of distributable profits or retained earnings distributable; classified as equity instruments in accordance with IFRS.

Tier 2 Capitals

Revaluation Reserve

Fixed Asset Revaluation Reserve: This relates to revaluation of fixed assets in line with market values reflected on the face of the balance sheet. Prior approval of the CBN must be obtained by any bank before the recognition of the revaluation surplus on fixed assets in its books, which can only be done taking into consideration the following:

i. The valuation must be made by qualified professionals and the basis of the revaluation as well as the identities of the values must be stated.
ii. The difference between the market and historic values of the eligible fixed assets being revalued shall be discounted by 55%.
iii. The revaluation of fixed assets is applicable to own premises only; and
iv. The revaluation of fixed assets (own premises only) is permissible within a minimum period of seven years after the date of the purchase of the asset or the last revaluation.

Other revaluation reserves: The inclusion of other revaluation reserves created by the adoption of the international Financial Reporting Standards (IFRS) as part of the Tier 2 capital shall be subject to the limitations that will be specified by the CBN from time to time.

General provisions/General loan-loss reserves: For the purpose of the standardized credit risk measurement approach, provisions or loan-loss reserves held against future (presently unidentified), losses are freely available to meet losses which subsequently materialize and therefore qualify for inclusion in Tier 2 capital. Provisions ascribed to specific or identified deterioration of particular assets or known liabilities, whether individual or grouped (collective), are excluded. Furthermore, general provisions/general loan-loss reserves eligible for inclusion in Tier 2 will be limited to a maximum of 1.25 percentage points of credit risk weighted assets and subject to the approval of the CBN.

Hybrid (Debt/equity) capital instruments: These include financial instruments which combine characteristics of equity and debt capital. Essentially, they should meet the following requirements:

i. They are unsecured, subordinated and hilly paid-up;
ii. They are not redeemable at the initiative of the holder or without the prior consent of the CBN.
iii. They are available to participate in losses without the bank being obliged to cease trading (unlike conventional subordinated debt);
iv. Although the capital instrument may carry an obligation to pay interest that cannot permanently be reduced or waived (unlike dividends on ordinary shareholders equity), it should allow service obligations to be deferred (as with cumulative preference shares) where the profitability of the bank would not support payment.
v. Hybrid capital instruments that are redeemable must have a maturity of at least 10 years. The contract must clearly specify that repayment is subject to authorization by the Central Bank of Nigeria. Cumulative preference shares, having these characteristics, would be eligible for inclusion in this category.

Subordinated term debts Subordinated debts issued by banks shall form part of the Tier 2 capital provided that the contracts governing their issue expressly envisage that:

i. In the case of the liquidation of the issuer, the debt shall be repaid only after all other creditors not equally subordinated have been satisfied.
ii. The debt has an original maturity of at least five years; where there is no set maturity; repayment shall be subject to at least five years' prior notice.
iii. Early repayment of the liabilities may take place only at the initiative of the issuer and shall be subject to approval of the CBN.
iv. The contracts shall not contain clauses whereby, in cases other than those referred to in points a) and c), the debt may become redeemable prior to maturity.
v. During the last five years to maturity, a cumulative discount (or amortization) factor of 20% per year will be applied to reflect the diminishing value of these instruments as a continuing source of strength. Unlike instruments included in hybrid capital above, these instruments are not normally available to participate in the losses of a bank which continues trading. For this reason, these instruments will be limited to a maximum of 50% of Tier 1 Capital.

Capital Regulation and Nigerian Banks

Since the inception of banking regulation in Nigeria, there has always been a directive issued from time to time by the regulatory authorities on the minimum paid-up capital required before a bank can be licensed to operate. The stipulated minimum paid-up capital requirements over the years have witnessed a steady growth in amount since the first Nigeria banking law was passed in 1952. The 1952 banking ordinance stipulated a minimum capital of N25, 000 for indigenous and N200,000 for expatriate commercial banks in the system. This rose to ₦600, 000 and N1.05m for indigenous and expatriate banks respectively by the 1962 act.

The minimum paid-up capital before 1991 was N20 million and by the provision of section 9 (2) of Bank and Other Financial Institution Decree (BOFID), the minimum start-up capital rose to N50 million and in the 1997 budget it was increased to N500 million for both commercial and merchant banks. Presently, the minimum start-up capital has been increased from N2 billion in 2004 to a minimum of N25 billion. There is no doubt that the Basle Accord influenced the bank recapitalization policy in Nigeria.

Table 1. Trend of Minimum Paid-up Capital of Banks in Nigeria (1952 – 2010)

Year	Type of Bank	Minimum Capital Requirement
1952	Commercial Banks	£12,500.00
1969	Commercial Banks	£300,000.00
1979	Commercial Banks Merchant Banks	N600,000.00 N2,000,000.00
1988 (February)	Commercial Banks Merchant Banks	N5,000,000.00 N3,000,000.00
1988 (October)	Commercial Banks Merchant Banks	N10,000,000.00 N6,000,000.00
1989	Commercial Banks Merchant Banks	N20,000,000.00 N12,000,000.00
1991	Commercial Banks Merchant Banks	N50,000,000.00 N40,000,000.00
1997	Commercial Banks Merchant Banks	N500,000,000.00 N500,000,000.00
2000	Commercial Banks Merchant Banks	N1,000,000,000.00 N1,000,000,000.00
2001	Commercial Banks Merchant Banks	N2,000,000,000.00 N2,000,000.000.00
2005 – till date	Commercial Banks	N25,000.000.000.00

Source: Lucky and Akani (2018)

Supplementary Capital and Financial Performance

Similar to core capital, the connection that exists within supplementary capital and banks' performance remains largely unexplored. The few extant studies also report conflicting results. Al-Hadid (2017) assessed, in a descriptive study, the impact of funds structure on financial performance in public listed commercial institutions in Jordan and found that core capital affects the performance of the commercial institutions. On the contrary, Gary (2016) employed the cross-sectional design in his study and suggested an inverse connection between these variables. Chinoda, Chingombe and Chawuruka (2015) employed a descriptive survey in their study which made two key conclusions; strengthening capital empowers commercial institutions to achieve benefits; and minimum capital diminishes the odds of being troubled, as institutions won't stand constrained by means of transient acquiring which is for the most part at significant expense.

Regulatory Views of Tier 2

There is an across the board accord in the guiding framework network that Level two capital characterized in the Basel Treaty is unsuitable. For instance, Turner (2009) noted worries about Level two that it is just valuable for creditor's protection; however, it fails to provide correct impetuses to financial institutions' continuous activities. Specifically, the misfortune caused by proprietors of the financial institutions in the event of going down is diminished particularly by keeping Level two inside an assumed general Basel proportion. Turner presumed as follows; "the FSA in this way accepts required capital proportions for such banks ought to be communicated altogether as far as top-notch capital comprehensively the present Core Level one and Level one definitions and ought not to consider dated subjected debt as offering important help.

In addition, in the present proposition, Basel 3 has downsized, however, not disposed of the job of Level two in financial institutions' administrative regulatory framework capital (BCBS, 2010). The 1988 Basel Agreement devised accompanying capital requirements which include: the entire risk-balanced assets proportion should be more noteworthy than eight percent; capital might include Level one (equity) and Level two (lesser superiority equity and semi-debt mechanisms). Level one should be at any rate half of total capital, and as needs are, Level two might not surpass Level one. This general outline is shadowed in Basel 2, aside from the extra differentiation of Higher Level two and Lesser Level two. Gathering the Level one imperative is not adequate for achieving the Basel necessities. It is just the entire assets imperative which is important as well as an adequate situation for fulfilling the Basel agreement (Chami & Cosimano, 2003).

Level one is a bank's centre resources, the primary parts being common investors' equity; held profit; never-ending non-total preferred stock; funds made by assignments of reserved income, among other oversupplies; and marginal premiums. The reserves and equity component of Level one is frequently alluded to as 'Core Level one'. The Level one favoured components are frequently known as 'hybrid mechanisms' since they possess a blend of both equity and debt characteristics. Level one should have no legally binding commitment to deliver profits or enthusiasm to Level one owners utilizing the delay of a voucher ordinarily being the alternative of the guarantor, conceded vouchers or profits are non-aggregate. Level one ought to have the option to absorb previous misfortunes, but in Britain, the FSA permits a restricted step-up related to a call after the tenth commemoration of the subject (Chami & Cosimano, 2003).

The principle parts of Upper Level two, together with dues changeable to equity, are ceaseless deferred subjected dues; readjustment holds from static resources and static resource speculations; and broad requirements (Benston, Irvine, Rosenfeld, & Sinkey, 2003). In the meantime, lower Level two capitals subjected liability is generally customary in structure and modest for financial institutions to issue.

Financial industry watchdogs will generally lean towards Level one, and have regularly customary guidelines at a countrywide Level in surplus of Basel for equity possessions. For instance, the USA obliges six percent Level one for financial institutions and financial institutions holding organizations. Purposes behind this inclination incorporate the possibility that equity is a superior discipline tool than a liability, and that it is simpler to reduce profits when money is required than defaulting on premium commitments. With a blend of debt and equity in capital, there may be good danger prompting risk-taking for the benefit of the main investors to the detriment of subjected debt holders. Rating offices likewise have noted that Level one moderates money which can be redirected to different exercises that can upgrade its income, not at all like debt which offers ascend to a commitment. In any case, financial institutions may react to the controller's inclination for Level one by, for instance, in the USA disregarding mechanisms, trust favoured protections given they were named Level two, yet giving critical volumes when they were renamed to Level or Tier one (Benston *et al*., 2003).

Real Sector Investment

Investment can be broadly defined as the acquisitions of an asset with the aim of receiving a return (Odoko, 2012). It could also mean the production of capital goods; goods which are not consumed but instead used in future production. Examples include building a rail road, or a factory, clearing land, or putting oneself through college. There are several motives for investment. The basic motive is profit/return. According to Keynes' theory, this motive depends on the under-utilization of capital. Soludo, (2011) described investment as generally conceptualized in terms of "physical" capital formation. The explanation derives from the neoclassical production function with separable input factors – mainly capital and labour, and with investment adding to the stock of capital. Real domestic investment is an expenditure made to increase the total capital stock in the economy. This is done by acquiring further capital-producing assets and assets that can generate income within the domestic economy. Physical assets particularly add to the total capital stock.

Keynes (2007) defined investment as the production of new capital goods, plants and equipment. He also refers investment as real investment and not financial investment. Investment is a conscious act of an individual or any entity that involves deployment of money (cash) in securities or assets issued by any financial institution with a view to obtain the target returns over a specified period of time Wondwesen (2011) opined that Keynesian theory helps investment to play a critical role both as a component of aggregate demand as well as a vehicle of creation of productive capacity on the supply side and in determining medium run growth rates.

Securing investment funds is an essential issue for every national economy. The central problems of such financing are in fact the accumulation of necessary capital, but also its adequate distribution. With the openness of their own economies to foreign capital, countries in transition, those that move from centralized market organization to free markets, are trying to achieve market allocation of the same. However, such activities, in the opinion of most

economists, lead to dependence on external capital inflows, which further implies a direct "spillover" of external economic shocks into the domestic economy. In order to avoid the aforementioned negative reprisals when using foreign capital as a source of funds for financing investments and further economic growth, the literature emphasizes the importance of domestic sources of financing economic growth.

Domestic investment can generally be referred to as the investment in the companies and products of one's own country rather than in those of foreign countries. Domestic investment comprises of private and public investment. Private investment can be defined as investment by private businesses for the motive of generating profit whiles public investment refers to investment by the government sector primarily, but not exclusively, on social and core economic infrastructure (Matsila, 2014). Domestic investment is one of the most important components of economic growth that countries consider as the main engine of the economic cycle. Recent theories on the nee-classical growth model as well as theories of endogenous growth has emphasized the role of domestic investment in economic growth such as capital spending on new projects in the sectors of public utilities and infrastructure like roads projects, housing, electricity extensions, as well as social development in the areas of health, education, and communication projects among others.

The determinants of investment are much clearer with the empirical literature than when theoretical arguments are postulated on investment in many countries including Nigeria. Nnanna *et al* (2004), authoritatively posit that the main determinants are in two forms: the finance and investment model. The finance model was however employed in the regression estimates carried out. The investment model starts with Cobb-Douglas production function measures capital or investment in physical assets first. Then it was specified to include the distortions and accompanying shocks, constraints and exogenous shocks in the macro economy as follows:

$$Y = f(A, K, L) = A, L \quad (1)$$

Where *Y* represents output, *K* is the capital stock, L labour supply and A the total factor productivity

$$K\ f\ (r\ psc\ ner\ Y): \quad (2)$$

Where *r, psc, ner* and *Y* represent prime lending rate, (PLR), credit to the private sector, nominal exchange rate and national income respectively. The finance model of determinants of investment in Nigeria could be seen to be mainly from debt and non-debt sources that could be domestic or foreign with the following model

$$PSC\ f\ (SAVS, INV), \quad (3)$$

Where, *PSC, SAVS* and *INV* represent private sector credit, National Savings, and Investment respectively (Investment is divided into two parts namely *PUV* Public and Private Investment)

Theoretical Review

Theory of Financial Intermediation

The theory of financial intermediation was first formalized and popularized in the works of Goldsmith (1969), Shaw (1973) and Mckinnon (1973), who see financial markets (both money and capital markets) playing a pivotal role in economic development, attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. Supporting this view is the result of a research by Nwaogwugwu, (2008) and Dabwor, (2009) on the Nigerian stock market development and economic growth, the causal linkage. However, this contrasts with Robinson (1952), who argued that "financial markets are essentially hand maidens to domestic industry, and respond passively to other factors that produce cross–country differences in growth. Moreover there are general tendency for supply of finance to move along with the demand for it. The same impulse within an economy, which set enterprises on foot, makes owners of wealth, venturesome and when a strong impulse to invest is fettered by lack of finance, devices are invented to release it.

Modigliani-Miller Theorem

According to the Modigliani-Miller theorem put forward by Modigliani and Miller in 1958, in an unregulated environment without the costs associated with taxation and bankruptcy charges, the mode through which a bank is financed is inconsequential to its market value; this is because the market worth of a bank is explained by its receiving control and the risks associated with its assets (Nugroho & Anggoro, 2013). However, given that banks operate in an environment with taxation and other associated charges, it is necessary for the optimization of lending avenues for minimal expenditure.

In light of this observation, banks with optimal debt financing are able to claim tax cuts on account of this mode of financing and are therefore able to perform better than those financed solely or over-proportionally by non-liability sources, such as shareholder funding (Nugroho & Anggoro, 2013). Relating this theorem to capital adequacy regulation, it is apparent to the regulators' interest that the amount of capital assembled through equity capital and declared reserves be regulated to curtail overreliance on risk-taking through increased loan-based funding with the incentive of reduced taxation in markets that provide tax cuts through considering banks' capital structure. The Miller-Modigliani proposition is therefore important in optimization of a company's financing considering capital requirements by law (Nugroho & Anggoro, 2013).

Buffer Theory of Capital Adequacy

This theory pointed out that as bank approaches the minimum capital requirements; they tend to increase their assets to evade charges which may be incurred in case of a break of the stipulated governing capital. According to Calem and Rob (1999), breaking the stipulated governing capital provisions will lead to fines. Financial institutions prefer to maintain capital in extra of prudential limits to decrease the chances of deteriorating below lawful capital provisions. They observed that there exists a U-shaped association between risk-taking and capital for financial institutions. Undercapitalized financial institutions lean towards taking more risks anticipating that insolvency cost can be moved to Federal Deposit Assurance Company. Sufficiently exploited banks capitalize in precarious selection anticipating greater profits which can be used for the sustained development of their capital situation (Rime, 2001). Supporting the theory, Gropp and Heider (2010) argued that buffer resources have several functions which are, promotional, protective, regulatory and operational. The operational function is related to the support of bank activities and ensuring volumes which in turn leads to gains for the institution. The promotional function is explained by how banks safeguard

enough resources to ensure the development and meet the prospects of the stakeholders hence promoting economic growth. The protective functions in the bank's capital are seen in its ability to protect banks from unforeseen misfortunes and safeguarding occupational continuity and reliability. As management ensures that adequate capital is held to take somewhat unexpected losses; the capital ends up playing regulatory function, therefore, defending the banks against breaking of capital requirements (Volkov, 2010). According to this theory banks may aggressively increase their loan book without increasing their capital base hence the requirement for capital standards. In order to avoid this risk most banks prudentially have set their benchmarks which is higher than the regulator's set requirements. The additional resources contribute to the growth of operations and this ends up improving the financial performance. The theory applies to the study since it provides for holding extra capital. Extra capital leads to a reduction of costs which could result in fines in the event of breaking the governing provisions and also support operations result in being improved financial performance.

Empirical Review

Leesi (2021) developed a stress test framework that facilitates the analysis of the direct effects of monetary policy shocks on the asset quality of Nigeria commercial banks and feedback effects of assets quality on monetary policy variables using causality test. The framework ensures consistency in the key relationships between monetary policy variables and asset quality. This is accomplished by embedding a standard stress-testing framework based on aggregate commercial banks' data in a semi-structural monetary policy model. The framework has numerous applications that can strengthen stress testing and macro financial analysis. The paper found that asset quality respond strongly to volatility of prime lending rate and monetary policy but weak respond to volatility of Treasury bill rate, reserve requirement and maximum lending rate. The paper recommends that commercial bank managers formulate policies that will managed the volatility of the variables.

Farayibi (2016) examined stress testing in the Nigerian banking sector from 2004-2014 using error correction mechanism (ECM) and Ordinary Least Square (OLS) methodologies. The study adopted the bottom-up approach to stress management. Evidence from the analysis showed that stress testing is important to building a strong and viable financial system in the country. Bank's going concern depends on profitability, solvency and liquidity whereas banks performance index depends on the behaviours of macroeconomic variables. The study found that Nigerian banking system is susceptible to various risks both within and outside the country. They are also exposed to macroeconomic risks as their performance index is based on these variables. The study concluded that how banks respond to risks determines the going concern and the viability of the nation's financial system. Thus, a thorough credit risk management framework championed by the major stakeholders involved in the credit disbursement was recommended.

Orobah and Anwarul (2020) examined the literature on financial stability implication of stress testing for risk-taking and credit growth in banks. Macro prudential considered one of the most stress testing tools by Applying countercyclical Macro prudential tools to build up capital buffers in good times that can be run down during bad times. But to improve timing, monitories authorities may need to develop a comprehensive framework to monitor Macro prudential conditions and establish appropriate warning and trigger thresholds. Regarding scope, they

examine the entire financial system. This entity contributes to fire sales whose default has follow-on effects, or which can exacerbate a credit crunch that is included. Liability Considerations contain a Scale of wholesale funding that is run-prone is paramount. Capital adequacy depends on the health of the overall financial system. For asset Considerations, the test indicates whether the financial system is vulnerable to deleveraging that might amplify adverse shocks, at the end authorities' development guidance about whether to close a bank and when to sell its assets to maximize taxpayer recovery. The authors concluded that the financial stability implications of stress tests for risk-taking and credit growth among banks are the following: A reduction in credit is a feature on stress tests. Post-crisis reforms traded the expectation of lower credit growth for reducing the probability that the larger banks would fail. This has a high negative impact on the economy. Higher capital requirements for the larger banks have prompted a reduction in the supply of credit, especially to riskier borrowers. Smaller banks have increased their share of local market-wide lending, and larger businesses have seen quite generous credit availability in bond and leveraged loan markets. Consider the structure of the financial system and its complexity long the levels of economic integration and openness.

Kithinji (2010) assessed the effect of credit risk management on the profitability of commercial banks in Kenya using data on the amount of credit, level of non-performing loans and profits from 2004 to 2008. His findings revealed that the bulk of the profits of commercial banks were not influenced by the amount of credit and non-performing loans, and therefore suggested that other variables other than credit and non-performing loans impact on profits. Chen and Pan (2012) examined the credit risk efficiency of 34 Taiwanese commercial banks over the period 2005-2008. Their study employed financial ratio to assess the credit risk and was analyzed using Data Envelopment Analysis (DEA). The credit risk parameters were credit risk technical efficiency (CR-TE), credit risk allocative efficiency (CR- AE), and credit risk cost efficiency (CR-CE). Their findings showed that only one bank was efficient in all types of efficiencies over the evaluated periods. Based on their result, they concluded that banks in Taiwan showed relatively low average efficiency levels in CR-TE, CR-AE and CR-CE in 2008. Poudel et al. (2009) studied the factors affecting commercial bank performance in Nepal for the period of 2001 to 2012 and followed a linear regression analysis technique. The study revealed a significant inverse relationship between commercial bank performance measured by ROA and credit risk measured by default rate and capital ratio.

Akani and Lucky (2015) examined capital adequacy ratios and the impact on the profitability of Commercial Banks in Nigeria from 1980 – 2013. The objective is to investigate whether there is a dynamic long run relationship between capital adequacy ratios and the profitability of commercial banks. Time series data were sourced from Stock Exchange factbook and financial statement of quoted commercial banks and the Johansen co-integration techniques in vector error correction model setting (VECM) as well as the granger causality test were employed. The study has Return on Asset (ROA), Return on Investment (ROI) and Return on Equity (ROE) as the dependent variables and the independent variables are Adjusted Capital to Risk Asset Ratio (ACRR), Capital to Deposit Ratio (CTD), Capital to Net Loans and Advances Ratio (CNLAR), Capital to Risk Asset Ratio (CRA) and Capital to Total Asset Ratio (CTAR). The empirical result demonstrated vividly in the models that there is a positive long run dynamic and significant relationship between return on asset and capital to risk asset ratio and capital to deposit ratio while others are negatively correlated. The findings also revealed

that there is bi-directional causality running from ROA to ACRR and ROA to CNLAR. Asikhia and Sokefun (2013) studied the effect of capital adequacy on the profitability of Nigerian banks using both primary and secondary data from 2006 – 2010. The findings from primary data shows no significant relationship but the secondary data results shows positive and significant relationship between capital adequacy and bank profitability.

Ikpefan (2013) examined the impact of capital adequacy, management and performance of Nigerian commercial banks from 1986 – 2006 using time series data obtained from Central Bank of Nigeria statistical bulletin and Annual financial statement of sampled banks. The overall capital adequacy ratios of the study shows that shareholders fund/Total Assets which measured capital adequacy of bank (risk of default) have negative impact on ROA. The efficiency of management measured by operating expenses indicates negative impact ROC. Al-Sabbagh (2004) analyzed determinants of capital adequacy ratio in Jordanian banks, by studying the financial statements of a sample of 17 banks in two periods. The first period is conducted from (1985-1994) which represent a time before applying Basel committee standards for capital adequacy ratio in Jordanian banks while the second period covers from 19 (1195-2001) which is a time after applying Basel committee standards for capital adequacy ratio that represented in a minimum capital adequacy ratio (CAR) of 8%. The study found that most Jordanian banks are committed by a minimum 8% capital adequacy ratio. He used a model of nine independent variables expected to affect CAR using correlation coefficients and regression analysis. He found a negative relation between CAR and bank's size, while CAR was positively affected by ROA, loan to assets ratio (LAR), and equity ratio (EQR). CAR has a positive relation to risky assets ratio (RAR) in the period (1985-1994), while the relations become negative over the period (1995-2001). CAR is negatively affected by deposits assets ratio between (1985-1994) and positively affected by a size of banks‟ deposits in a period (1995-2001). CAR is negatively affected by loan loss provision (LPR), and positively affected by dividend payout ratio (DR) over the period (1995-2001).

Isaac, Samuel and Mailafia (2014) reported a positive but insignificant relationship between capital adequacy and bank's profitability. Secondary data of 14 listed deposit money banks in Nigeria from 2005 to 2012 was employed. The study employed correlation research design. In examinining the relationship between profitability (dependent variable) and bank-specific factors (independent variables), ordinary least square (OLS) regression model was conducted. However, the study failed to test for Fixed Effect and Random Effect estimates, associated with panel data regression. Therefore, Ordinary Least Squares (OLS) estimate could lead to biased result, (Christos and Geoffrey 2011) about determinants of bank profitability. Stephen, Kolapo and Aluko, (2014) investigated the determinants of bank profitability- panel evidence from Nigeria. The study used panel data method to examine time series and crosssectional data obtained from 2000 to 2013 on a sample of 14 listed deposit money banks in Nigeria. A positive but insignificant relationship between capital adequacy and bank's profitability was shown but was spuriously analyzed as being significant in the research conclusion.

Ejoh and Iwara (2014) investigated the impact of capital adequacy on Deposit Money Banks' profitability in Nigeria, using secondary data of five selected banks from the period 1981 to 2011. The study used the Engle and Granger two steps procedure in co-integration. The research findings showed a positive and significant relationship between capital adequacy and banks' profitability, implying that banks with equity financing appear to have more safety and

subsequently, higher profitability. It was then, recommended that Nigerian banks should be well capitalized for cheaper sources of funds and for improvements in returns. However, the result of an investigation conducted with only five banks and equally carried out only during the pre-IFRS adoption era in Nigeria may not be used for generalization in a region such as Nigeria.

Khaled and Samer (2013) examined the determinants of capital adequacy in Deposit Money Banks of Jordan for the years 2000 to 2008 using annual reports of banks listed on Amman Stock Exchange. Multiple linear regression analysis was employed to ascertain the factors that mostly affect the degree of capital adequacy. Pearson Correlation Coefficient was also used to determine the directions of the expected relationship between independent and dependent variables. Chris (2010) examined the relationship between profitability and capital adequacy of all licensed Commercial Banks in Kenya from 2004 to 2009. Profitability was measured using ROA and ROE while capital adequacy was represented by the capital asset ratio. The regression model was applied for the analysis. It was then, reported that there is a significant negative relationship between capital adequacy and ROA while insignificant relationship was found between capital adequacy and ROE. It was then suggested as areas for further research, that a similar study could be conducted over a longer period of time, which would also focus on the impact of the macroeconomic environment such as inflation and GDP because they do influence bank profitability. Nonetheless, the result of the study may not be used for generalization in a region such as Nigeria because it was conducted before and during the global financial crisis, leaving the events after the crisis un-investigated.

Ronoh and Ntoiti (2015) examined the effects of capital structure on financial performance of listed commercial Banks in Kenya, a case study of Kenya Commercial Bank Limited. The study adopted descriptive research design. Overall annual financial reports of 230 branches of Kenya Commercial Bank limited formed the target population. The main source of data for the study was Secondary data. The multiple regression models used considered performance as the dependent variable and was measured in terms of ROA and ROE. Results indicated that deposits, debt and equity was negative and significantly related to financial performance of listed commercial banks in Kenya as measured by return on assets. The regression analysis results indicated that the relationship between Retained Earnings ratio was positive although insignificantly related to financial performance as measured by return on assets. It was therefore concluded that capital structure of listed commercial banks in Kenya is significant and affects financial performance of commercial banks negatively. The above studies confirm that researchers are yet to agree on the degree to which capital adequacy ratio influence financial performance of second tier commercial banks.

Al-khawaldah, Al-tarawneh and Ghazi-alassaf (2020) examined the effect of the capital adequacy on the return on equity for the largest 16 Islamic banks in Gulf Cooperation Council in terms of market value, using panel data analysis during the period (2010-2014) and size, inflation, and GDP as a control variables, The study collected data from published annual reports of banks and found that there is a significant relationship between capital adequacy and return on equity. Size has a statistically significant positive effect on the return on equity, inflation has a statistically significant negative effect on the return on equity while GDP has a statistically significant positive effect on the return on equity. Torbira and Zaagha (2016) investigated the impact of capital adequacy measures and bank financial performance in

Nigeria for the period 2008-2012. The ratio of Shareholders fund to bank total assets was used as a proxy for capital adequacy while the proxy used to measure bank financial performance was net profit margin, earning per share and return on assets (ROA). The augmented Dickey-Fuller unit root test results indicated that the data series achieved stationarity after first differencing at the order 1(1). The analysis revealed the existence of significant long run relationship between bank financial performance variables and capital adequacy indicators in the Nigerian banking industry. The granger causality test results revealed that there is unidirectional causality flowing from the ratio of shareholders' fund to bank total assets. These suggest that capital adequacy strongly and actively stimulate and improve the financial performance of banks in Nigeria.

Mugwang (2015) examined the effect of Capital Adequacy on Commercial Banks performance in Kenya for the period 2009 – 2013 using Multiple Linear Regression Analysis and the Pearson Correlation Coefficient. The target population comprised all registered commercial banks in Kenya in a five year period 2009 to 2013. Secondary data was used from Nairobi Securities Exchange for listed banks and management of banks that are not listed. The overall conclusion of the study was that there is a significant relationship between the Liquidity Risky Assets, Credit Risks, Capital Risks, Interest Rate Risks, Return on Asset Ratio, Return on Equity Ratio and Capital Adequacy. Jha and Hui (2012) conducted a study on the effect of capital adequacy on financial performance of commercial banks in Nepal utilizing multivariate regression analysis. The research results revealed that return on assets was significantly influenced by capital adequacy ratio, interest expenses to total loan and net interest margin, while capital adequacy ratio had significant effect on return on equity.

Olalekan (2013) examined the effect of capital adequacy on profitability of deposit-taking banks in Nigeria using linear regression for data gathered from cross sectional research design and panel data from published financial statement of banks for the period 2006 – 2010. The result indicated that there was no significant relationship between banks capital adequacy and their profitability. The paper recommended that the regulatory authority should ensure that the gains of banking reforms were sustained and that the Central Bank of Nigeria should take more decisive measures to tighten the risk management framework of the Nigerian banking sector so as to positively affect their profitability. Multiple regression analysis was applied by Abba (2013) to data sourced from the Nigerian banking industry between 2007 and 2011 to empirically examine the relationship between capital adequacies and banking risks. The results of the study revealed that total assets in Nigerian Banks were highly risky, and that capital adequacy ratio reduces with increase in deposits, and finally, that there was a negative relationship between capital adequacy ratio and risk -weighted assets. The study recommended that Nigerian banks should adopt a risk-based approach in managing capital and the regulators should make every possible effort to guarantee the safety of depositors' money since increase in deposits does not necessarily result to increase in capital adequacy ratio.

Ugwuanyi (2015) adopted a simultaneous linear regression to assess the relationship between banks' capital and their risk-taking behavior in Nigeria using annual data of quoted banks covering the period 2009-2013. The results indicate that past risk, size of the bank, interest margin and capital adequacy are positively related to variations in current risk, implying that bank size and capital fuels banks' appetite for risk. Moussa (2015) studied the relationship between capital and bank risk in Tunisia from 2000 – 2010. The author found that capital and

risk were two important variables and that there was a negative relationship between capital and bank risk. Ugwuanyi (2015) examined how regulation of bank minimum capital base in Nigeria interacts with the bank risk taking behavior using simultaneous linear regression. The study covered all quoted banks on the Nigerian Stock Exchange (NSE) from 2009 – 2013. The result revealed that regulation pressure has a negative correlation with capital adequacy and risk-taking appetite but does not significantly affect the capital adequacy as well as risk taking behaviors of Nigerian Banks.

Alkadamani (2015) investigated the impact of capital requirements on bank risk-taking during the period 2004 to 2014 for 46 commercial banks operating in four countries of Jordan, UAE, Saudi Arabia and Kuwait using the simultaneous equations model. The results revealed that there was a positive correlation between banks profitability and increase in capital, indicating that profitable banks can more easily improve their retained earning rather than issuing new securities. Umoru (2016) assessed the significance of the capital adequacy ratio in influencing the financial deeds of Nigerian banks by applying generalized least square (GLS) estimation technique for the period 2007 to 2015. The results showed an overriding effect of capital adequacy ratio and liquidity in enhancing the deeds of Nigerian banks.

Tobichukwu (2016) employed pooled regression analysis model to check the capital adequacy-risk management outcomes of the banks during the period between 2009 and 2015. The results showed that risk management variables exerted differing degrees of negative effects on capital adequacy. The paper recommended objective-oriented deposit drive by the banks to attract more deposits and those loans should be adequately secured to reduce the incidence of non-performing loans. Using a structural model of two different simultaneous equations, Maraghni (2017) examined the impact of changes in capital adequacy ratio to the risk-taking incentive of Ten (10) Tunisian banks between the period 1990 to 2012. The results indicated that changes in CAR were a consequence of regulatory pressure and both institutional and legal framework also affects CAR. They submitted that regulatory pressure relating to CAR requirements induces the desired discipline on banks in Tunisia during the study period. The presence of safety-net and guarantees by the Tunisian central bank, according to the authors, leads to moral hazards. The above studies examined capital adequacy and profitability, this study focused on capital adequacy ratios and real sector investment of quoted commercial banks in Nigeria.

METHODOLOGY

In this study, a descriptive survey design was adopted. Wairi (2011) defines descriptive research design as a scientific way involving describing and observing the behaviour of a theme devoid of affecting it in any way. Descriptive studies evaluate features related to the population under study (Cooper & Schindler, 2014). A descriptive research design was preferred as it allowed for the detailed examination of relations of the variables under study. Descriptive research design further helped in the collection of in-depth data from the study population that enabled proper analysis that provides clear and relevant recommendations. The dependent variable for the study is real sector investment while the independent variable is capital adequacy ratios. The target population includes all elements upon which the findings of a study are to be generalized (Janssen, Gould, Li, Brumby, & Cox, 2015). The target population involves making interpretation based on the entire set of units in study data. In this study, the target population included all the twenty four (24) commercial banks listed in the Nigerian

Exchange Group as at 31st December 2023. Garg and Kothari (2014) describe a sample as a collection of units, which should not be too large or too small, chosen from the universe to represent it. Generally, the larger the sample, the more representative the scores on the variables will be with regard to the population scores. Sampling design is a technique used in selecting a balanced representation from the total sample size, which is the population under study (Saunders, Lewis, and Thornhill, 2012). Sampling offers several advantages to a study which includes lowering the study cost and enables faster, efficient and accurate data collection. It also ensures the availability of necessary elements of the population required for the study and enables collection of manageable data which guarantees accurate results (Cooper & Schindler, 2014).According to Mugenda and Mugenda (2012), data collection refers to the methodological procedure utilized by a researcher to collect data, either primary or secondary, for a study. In this study, secondary data was used to generate the needed information to finalize the study. The study utilized published and audited financial reports of the fifteen (15) listed commercial banks listed on the NSE. The researcher used an observation checklist as the main data collection tool. Data collected for the study covered the period between the years 2014-2023.

Data Analysis Methods

Data analysis is the process of analysing, cleaning, transforming and modelling data collected from a sample or a population with the main idea of getting required information for the study and recommendations (Cooper & Schindler,M 2014). The secondary data gathered from the published reports of the fifteen (15) commercial banks were reviewed for completeness and accuracy, then organized logically, evaluated, analyzed and conclusions drawn. In the study, quantitative data analysis was employed. Statistical Package for Social Sciences SPSS version 25 was used to analyze the quantitative data and test their reliability. The data was presented using figures and tables. Multiple linear regressions were used to analyze the data collected so as to establish if there exist any relationship between dependent and independent variables.

The multiple regression models were:

$Y=\beta0+\beta1X1+\beta2X2+\beta2X2+\beta3X3+\beta4X4+\varepsilon$

Where:

Y=real sector investment

$\beta0$=constant term;

$\beta1,\beta2$=beta coefficient;

X1= Tier one capital ratio

X2= Tier two capital ratio

X3= Capital to deposit ratio

X4= Capital to risk assets ratio

ε =error term

The study used a 95% level of confidence. A 95% confidence interval reflects a significance level of 0.05 this shows that for an independent variable to have a significant effect on dependent variable, the p-value should be below the significance level (0.05).

RESULTS AND FINDINGS

Table 1: Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-19.964	37.713		-.529	.606	-102.133	62.205					
	Tier 1	1.683	1.442	.266	1.168	.266	-1.458	4.824	.215	.319	.264	.986	1.015
	Tier 2	.370	.264	.341	1.398	.187	-.206	.946	.259	.374	.317	.865	1.157
	CLD	.446	.225	.463	1.981	.041	-.044	.937	.424	.497	.449	.940	1.064
	CD	18.525	12.662	.363	1.463	.169	-9.063	46.112	.119	.389	.331	.835	1.197

a. Dependent Variable: RSI

Source; SPSS, 20.0

The regression coefficients table reveals that at 0.05 significance level, Tier one capital has positive but no significant effect on real sector investment of the quoted commercial banks (β = . 1.683, t = 1.168, *p* = . 266). Tier two capital has positive but no significant effect on real sector investment of the quoted commercial banks (β =.370, t = 1.398, *p* = .187). Capital to total loans has positive and significant effect on real sector investment of the quoted commercial banks (β =..446, t = 1.981, *p* = .041). Capital to total deposit has positive but no significant effect on real sector investment of the quoted commercial banks (β =.18.525t = 1.463, *p* = .169).

Table 2: Correlation Analysis

		RSI	TIER 1	TIER 2	CLD	CD
Pearson Correlation	RSI	1.000	.215	.259	.424	.119
	TIER 1	.215	1.000	-.078	-.008	-.057
	TIER 2	.259	-.078	1.000	.142	-.350
	CLD	.424	-.008	.142	1.000	-.236
	CD	.119	-.057	-.350	-.236	1.000
Sig. (1-tailed)	RSI	.	.203	.158	.045	.325
	TIER 1	.203	.	.383	.488	.414
	TIER 2	.158	.383	.	.293	.084
	CLD	.045	.488	.293	.	.181
	CD	.325	.414	.084	.181	.
N	RSI	10	10	10	10	10
	TIER 1	10	10	10	10	10

TIER 2	10	10	10	10	10
CLD	10	10	10	10	10
CD	10	10	10	10	10

Source; SPSS, 20.0

The correlation test was conducted at the 5% level of significance with a 2-tailed test. Pearson correlation was used to assess the nature and direction of the association between CAPITAL adequacy ratios and real sector investment of quoted commercial banks in Nigeria. The study assessed the nature and direction of the association, among the study variables, that is, if either core capital will increase, decrease or not affect the performance of commercial banks listed on the Nairobi Securities Exchange. The Pearson correlation between tier one capital real sector investment showed that the two variables were weak correlated, r = .215. The Pearson correlation between tier two capital real sector investment showed that the two variables were weak correlated, r = .259. The Pearson correlation between capital to loans ratio and real sector investment showed that the two variables were weak correlated, r = .424 while the Pearson correlation between capital to deposit ratio and real sector investment showed that the two variables were weak correlated, r = .119.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.920[a]	.885	.780	23.81369	.385	1.875	4	12	.180	2.264

a. Predictors: (Constant), TIER 1, TIER 2, CLD, CD

b. Dependent Variable: RSI

The results show a correlation value (R) of .920[a] which depicts a linear dependence between the independent and dependent variables. The R-squared value of .885 indicates that 88.5 of the variation in real sector investment of the quoted commercial banks were explained by capital adequacy ratios. However, 11.5 are explained by other factors not included in the model.

Table 4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4253.650	4	1063.413	1.875	.000[b]
	Residual	6805.104	12	567.092		
	Total	11058.754	16			

a. Dependent Variable: RSI

b. Predictors: (Constant), TIER 1, TIER 2, CLD, CD

Analysis of variance was done to show whether there is a significant mean difference between dependent and independent variables, presented in Table 4.4. ANOVA statistics revealed a P-value of 0.000; the result indicates that capital adequacy ratios (independent variable) have a significant relationship with real sector investment (dependent variable).

Discussion of Findings

The study found that 0.05 significance level, Tier one capital has positive but no significant effect on real sector investment of the quoted commercial banks (β = . 1.683, t = 1.168, p = . 266). Tier two capital has positive but no significant effect on real sector investment of the

quoted commercial banks (β =.370, t = 1.398, *p* = .187). Capital to total loans has positive and significant effect on real sector investment of the quoted commercial banks (β =..446, t = 1.981, *p* = .041). Capital to total deposit has positive but no significant effect on real sector investment of the quoted commercial banks (β =.18.525t = 1.463, *p* = .169). The empirical findings of the study confirm the findings of Ogujiuba, et al. (2014) that government need to urgently address the problem of financial intermediaries cum stability in the system as a national priority, and to build institutions that would drive the reform process, the findings of Abereijo and Fayomi (2005) that there were still many challenges that the banks in Nigeria need to tackle before a successful implementation of the scheme. These include those challenges that relate to cash flow, investment structuring, monitoring/value enhancement, and liquidity and exit strategies, the findings of Dionco-Adetayo et al. (2016) that enterprise promotion programs were focused on fostering small scale industries in terms of technical, extension, training, technology adaptation and commercialization, and information services, the findings of Asikhia (2019) that every action of the business owners were gauged by the expectations conceived before commencement of banking relationship, it was these expectations and not the present relationship that determines their future decisions and the finding of Adelegan (2018) that increase in PLR reduces output for the period under study, but this was not statistically significant. In addition, the relationship between PDI and PDI is positive but statistically insignificant.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study investigated the effect of capital adequacy ratios on real sector investment in Nigeria. The study comprised five chapters. Chapter one contained details of the background to the study, statement of the problem, five objectives, and research questions and hypotheses were formulated. chapter two of the study reviewed literature which comprises, the conceptual, theoretical and empirical review, chapter three is methodology, the chapter contained the research design, sources of data, model specification and data analysis methods while chapter four presents the data, results and discussed the findings, this chapter five summarized, conclude and make recommendations. The study found that 0.05 significance level, Tier one capital has positive but no significant effect on real sector investment of the quoted commercial banks (β = . 1.683, t = 1.168, *p* = . 266). Tier two capital has positive but no significant effect on real sector investment of the quoted commercial banks (β =.370, t = 1.398, *p* = .187). Capital to total loans has positive and significant effect on real sector investment of the quoted commercial banks (β =..446, t = 1.981, *p* = .041). Capital to total deposit has positive but no significant effect on real sector investment of the quoted commercial banks (β =.18.525t = 1.463, *p* = .169).

From the findings, the probability value corresponding to Tier one capital adequacy ratio .215 greater than 0.05, the study conclude that Tier one capital ratio has no significant effect on real sector investment of quoted commercial banks in Nigeria. The probability value corresponding to Tier two capital adequacy ratio .259 greater than 0.05, the study conclude that Tier two capital ratio has no significant effect on real sector investment of quoted commercial banks in Nigeria. From the findings, the probability value corresponding to capital to total loan capital adequacy ratio .041 less than 0.05, the study conclude that Capital to deposit ratio has significant effect on real sector investment of quoted commercial banks in Nigeria. The

probability value corresponding to capital to total loan capital adequacy ratio .119 greater than 0.05, the study conclude that Capital to total deposit ratio has no significant effect on real sector investment of quoted commercial banks in Nigeria.

Recommendations

i. The banking sector is critical to the general health of the economy. The sector's sustainability and regulation was crucial. To ensure this, the study recommends that quoted commercial banks increase and sustain their tier one capital to drive up real sector investment.
ii. Higher tier 2 capital will enable banks to engage in more lending activities and in return earn more interest on loans.
iii. Tier 2 capital was also found to positively affect the real sector investment of quoted commercial banks in Nigeria. As such, it is recommended that commercial banks observe high tier 2 capitals relative to the tier one capital to further cushion investors from risks.
iv. The regulatory authorities and commercial banks should study the operating environment to manage the market risk and better manage their liquidity ratio because these variables prevent affect credit to the real sector and the need for more banking sector reforms that enhances affects positively credit to real sector of the economy.

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