

Financial Deepening and Commercial Bank Soundness: Estimated Panel Data Study from in Nigeria

Lucky Anyike Lucky¹, Wike Chituru² and Okonkwo Juliet Chinenye³

¹Department of Banking and Finance, Faculty of Administration and Management,
Ignatius Ajuru University of Education, Rumuelumini Port Harcourt Rivers State, Nigeria

²Department of Finance, Faculty of Administration and Management, Rivers State University

³Department of Finance, Faculty of Administration and Management, Rivers State University

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Abstract: This study examined the effect of financial deepening on commercial banks soundness in Nigeria. time series data were sourced from Central Bank of Nigeria statistical bulletin while cross sectional data of bank soundness were sourced from financial statement of the quoted commercial banks from 2014-2023. Capital adequacy, assets quality and liquidity was modeled as the function of Credit to Private Sector as percentage of Gross Domestic Product, Broad Money Supply as percentage of Gross Domestic Product, Interest Rate Spread as the difference between lending and deposit rate, Market Capitalization Ratio as the percentage of market capitalization to Gross Domestic Product and Financial market depth as total market instrument to gross domestic product. Panel data ordinary least square was used. The study found that Private Sector Credit as percentage of gross domestic product has significant effect, Private Sector Credit as percentage of gross domestic product has no significant effect Private Sector Credit as percentage of gross domestic product has no significant effect. Ratio of Broad Money Supply as percentage of gross domestic product has no significant effect on quoted commercial banks capital adequacy in Nigeria, Ratio of Broad Money Supply as percentage of gross domestic product has no significant effect on quoted commercial banks liquidity, interest rate spread has no significant effect, Market Capitalization Ratio as percentage of market capitalization has significant effect, financial market depth has no significant effect, that financial market depth has significant effect while financial market depth has no significant effect on quoted commercial banks liquidity in Nigeria. From the findings, it was evidence that financial deepening has mixed effect on commercial banks soundness. We recommend that monetary authorities should ensure

stability of financial deepening indicators and commercial banks managers should device strategy to manage the volatility of financial deepening variables.

Keywords: Financial Deepening, Commercial Bank, Soundness Panel Data, Nigeria

INTRODUCTION

Financial deepening serves as a crucial catalyst for economic development and banking sector stability. In Nigeria, commercial banks play a pivotal role in mobilizing savings and channeling funds into productive investments, thereby facilitating the intermediation between surplus and deficit economic units. The Banks and Other Financial Institutions Act (BOFIA) 1991 (as amended) mandates these institutions to perform such intermediary functions, while the Central Bank of Nigeria (CBN), established under the Central Bank Decree of 1969, is entrusted with ensuring monetary and financial system stability. However, maintaining bank soundness within a dynamic and volatile financial environment remains a persistent challenge. The concept of banking fragility dates back to Fisher (1933) and Keynes (1936), who theorized that the debt financing of investment can have destabilizing effects. Both economists' writings were motivated by their personal observations of the Great Depression and of numerous banking panics. Banking fragility exist when substantial default of a member of household and banks without necessarily becoming bankrupt occurs and the aggregate profitability of the banking sector decreases significantly which is banking crisis (Toby, 2014). Banking fragility indicators (B.F.I) are statistical measures for monitoring the financial health and soundness of a country's financial sector and its corporate and household counterparts. Bank can be considered sound if the bank is capitally adequate, can withstand monetary and macroeconomic shocks and fall in the composite rate of 1 and 2 as specified by the Federal Deposit Insurance Corporation.

A strong, sound and reliable banking sector is a necessary condition for sustained economic growth since a sound financial system supports economic activities by pooling and mobilizing saving for productive use; providing information on potential and existing investments; exerting corporate governance; and facilitating trading, diversification, and risk management. The primary objective of banking regulation as contain in Central Bank of Nigeria Act and Bank and Other Financial Institution Act is to achieve sound banking sector that can effectively transmit monetary policy for the realization of macroeconomic goals. Nigeria banks have suffered from financial distress from time to time that can lead to total collapse

in the past decades and distressing financial conditions to a bank can be due to many factors, both internal and external. However, traditionally, the regulatory authorities considered bank soundness as solely function of capital adequacy, the persistent banking sector crisis most especially after the queries the relevant of capital adequacy in achieving bank soundness.

Nigerian banks have gone through various phases such as the free banking era and the regulated. An examination of the incident of bank failure proved that the objective of bank regulation is far from achieving its objectives. The effect of these policies and reforms on financial system stability remains debatable, attract research interest and create a knowledge gap. An examination of the policies reveals that the policies are far from achieving its objectives, for instance more banks failure in the regulated banking era than the free banking era. Twenty-six (26) banks failed between 1930 – 1959 as against 36 between 1994 – 2003. The number of commercial and merchant banks increased after the deregulation of the economy without corresponding increase in the regulatory capacity of the regulatory authorities in Nigeria that led to the banking sector crises in 1990s, this question the relevance of the regulatory authorities in achieving banking system soundness (Toby, 2014). Most of the existing studies have examined transmission effect vis-à-vis the aggregate economy using a single index such as gross domestic product hence creating a gap in the frontiers of knowledge regarding the effects of financial deepening on commercial banks soundness. Therefore this study focused on the effect of financial deepening on quoted commercial banks soundness in Nigeria.

LITERATURE REVIEW

Financial Deepening

Financial Deepening Scholars disagree on its. Hamilton and Godwin (2017) defined financial deepening (FD) as a growth in the supply of financial assets, which has resulted in a wide range of financial assets being available in the Nigerian economy. Deepening the financial sector simply implies that the deposit money bank can mobilize adequate savings for the purpose of investing (Ehiedu, Onuorah & Okoh, 2021). The money supply to GDP ratio illustrates the expansion of domestic savings and offers the true structure for the production of diverse financial claims, which is feasible with the development of Nigeria's banking system (Christian, 2013).

Akhator and Marcus (2018) referred financial deepening to the increased provision of financial services with a wider range of services intended to promote

the development of all societal segments. Fitzgerald (2016) believes that financial development entails the construction and extension of institutions, instruments, and markets that support the investment and growth process. The development and deepening of DMBs has resulted in the extension of DMBs instruments and growth process, which has greatly improved financial services to clients in the Nigeria banking society. Onyemachi (2016) defines banking industry deepening as a strategic approach to developing the banking industry and other financial sectors in the Nigerian economy by increasing the financial instruments/assets in the money and capital markets, which in turn expands the Nigerian economy's real sector. Obviously, this action is taking in rising economies in order to expand the intermediation process and accomplish economic progress (Onyemachi, 2016).

Market Capitalization Ratio

Capital Market capitalization refers to the total naira market value of a company's outstanding shares. Commonly referred to as market capitalization, is calculated by multiplying a company's shares outstanding by the current market price of one share, the investment community uses this figure to determine a company's size, as opposed to using sales or total asset figures (Osinubi, 2004). Capital market capitalization is measured in relationship to Broad Money Supply which signifies percentage of Broad Money Supply that is invested in the Nigeria capital market. Beck and Levine, (2004) have shown that with market capitalization, there is no theory suggesting that mere listing of shares will influence resource allocation and economic growth. Levine and Zervos (1998) also indicated that market capitalization is not a good predictor of economic growth. However, Yartey (2008) differs on this issue and opined that the assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis. For these unsettled discussions, we shall use market capitalization as a ratio of GDP, total value of shares traded ratio and turnover ratio, each at a time to determine the performance of each of them, and avoid multicollinearity in the model since (Demiguc-Kunt & Levine, 1996) has observed that different measures of stock market development are highly correlated.

Credit to Private Sector

The credit to private sector is said to be the engine of economic growth for a country, especially, for developing economies. The private sector remains the nucleus that

drives economic growth. Private sector funding (credit) is no doubt a driver of the real economy, particularly in developing economies like Nigeria where the financial markets are porous and near well developed to mobilize the needed resources to accelerate the desired level of economic development. The credit to private sector is the part of the economy that is run by individuals and companies for profit and is not state controlled. Therefore, it encompasses all for-profit businesses that are not owned or operated by the government. Companies and corporations that are government run are part of what is known as the public sector, while charities and other non-profitable organization are part of the voluntary sector. From the above, private sector funding refers to various sources of fund to private investors.

Credit to private sector entails the ways and means by which private firms and households (individuals) readily have access to fund to finance their investment and promote economic growth. It involves the pros and cons through which individuals and statutory firms' gains access to the availability of credit (fund) to finance and promote their investment drive. Credit to private sector involves credit extended by the banking and financial institutions to the private sector of the economy alone and basically include firms and households excluding loans disbursed to the government. According to the Global Economic Report (2019), domestic credit to private sector by banks refers to financial resources provided to the credit to private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment.

Money Supply

Monetary Policy refers to the specific deliberate actions taken by the Central Bank to regulate the value, supply and cost of money in the economy with a view to achieving Government's macroeconomic objectives. The objectives of monetary policy vary amongst various countries. While the objective of monetary policy is predicated on achieving price stability in a country, other countries seeks to achieve price stability and other diverse macroeconomic objectives. The Central Bank of Nigeria, like other central banks in developing countries, achieves the monetary policy objective via the volume of money supply.

The total volume (stock) of money in circulation among the public at a particular point of time is called money supply. Money supply is the entire stock of currency and other liquid instruments in circulation in an economy at a particular

time. The money supply can include cash, coins, and balances held in checking and savings account, and other near money substitutes. Economists are of the view that detailed analysis of money supply remains key variable towards understanding macroeconomic paradigm and a tonic that guides macroeconomic policy. Whereas monetization ratio includes money-based indicators or liquid liabilities like broad money supply to GDP ratio, intermediation ratio consists of indicators concerning bank-based measures like bank credit to the private sector and capital market-based measures such as capitalization ratio of stock market (Ndebbio, 2004).

Interest Rate

Interest rate spread (IRS) in an economy is crucial for growth and development, as numerous authors suggest a critical link between efficient intermediation and economic growth. Higher interest rate spread discourages a potential saver and is a barrier for a potential investor, since the cost of intermediating between a saver and an investor has strong implication for effective mobilization of funds. Inefficiency of financial intermediary causes high intermediation cost and increases loss of productive funds in intermediary process. This leads to a reduction in lending and investment.

The interest rate spreads (measured as the difference between deposit and lending rates) not only indicate the level of inefficiency of the banking sector but show the level of development of the financial system. Bank interest rate spreads have several important implications for growth and development of any economy. Specifically high interest rate spreads tend to discourage potential savers and thus limiting the quantum of funds available to potentials investors. A reduction in lending arising from low savings often leads to low investment and thus the economic growth rate. Incidentally, interest rate spreads in Nigeria increased by a large amount over the study period.

Bank Soundness

Bank soundness means the ability of a bank to maintain the solvency position in order to meet its long term fixed expenses and accomplish long term expansion and growth plans. In other words, bank soundness refers to the overall financial health of the bank, or the banking sector when all the banks are taken together. This includes the ability to meet short-term and long-term financial obligations as and when they fall due while complying with all the regulatory requirements.

Tuti (2016) defined bank soundness as condition in which the financial system comprising financial intermediaries, markets and market infrastructures-is capable of withstanding shocks and the unraveling of financial imbalances, thereby mitigates the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities. the International Monetary Fund(IMF)defined bank soundness (stability)as bank's capability to endure hostile events, such as bank run, major policy changes, financial sector liberalization and natural disasters. Hence, it reflects bank's ability to be solvent and to remain so under adverse economic conditions by means of their capital and reserve accounts. Bank soundness denotes a solid banking system that is well-regulated, well-supervised and where risks borne by individual banks are properly managed and continuously monitored. Though, the recent financial disturbances that peaked in 2008 have shown that the banking sector was the heart of the crisis, being the main source of vulnerabilities. Moreover, an important role was played by banks 'individual characteristics, being considered as factors of systemic instability, thus riskier banks, characterized by higher financial fragility, contributed more to systemic risk. A sound banking system is a system in which individual banks accounting for most of the system's transactions are solvent and meet capital adequacy requirements (Toby, 2006). Banking system is considered sound, if it is capittally adequate and can withstand monetary and macroeconomic shocks in its operating environment.

Commercial bank soundness is provided by high profitability of their activities, and also sufficient liquidity which indicates that banks has a balanced structure of assets and liabilities (Klaas & Vagizova, 2014). Financial stability of the banks in medium term can be reduced because of insufficient quality of capital, assets and liabilities, associated with aggression of their credit policy that increases credit risk, and as a result, probability of losses. Poor quality of credit portfolio indicating that unqualified management approaches of a credit portfolio are used with insufficient capitalization of some banks, but the size of capital defines ability of bank to maintain stability during the crisis periods, dependence on interbank credit market and significant share of demand liabilities in structure of bank liabilities (Klaas and Vagizova, 2014). The considerable share or active growth of such mobile, difficult to predict resources is dangerous, because recall of these funds or their spending can lead to bank insolvency and as a result to loss of bank stability (Klaas & Vagizova, 2014).

Measures of Bank Soundness

With the recommendation of the IMF, Central bank of Bosnia and Herzegovina began with a compilation of selected FSI exclusively for the banking sector, primarily because the share of this sector in the overall financial system. In order to calculate those indicators aggregation and data consolidation were used. Aggregation is the summarization of data, so that the overall position of one or transaction for any group of reporting units is equal to the sum of data for all individual units within the group. Consolidation refers to the elimination of transactions between group members in order to express financial situation and performance of the group as one of the accounting subject in relation to other businesses outside the group, for statistical purposes. Consolidation of data is carried out on a group and sector level.

Capital Adequacy

Capital adequacy is used to assess the financial health of the banking system as it reflects the capacity of this sector to absorb the eventual losses caused by either internal or external factors or even both. Roman and Şargu (2013) noted that bank soundness can be proxy by the ratio of total equity to total assets (TETA) and the ratio of total equity to total debts (TETD). TETA represents the proportion of total assets that are financed by a bank's shareholder while TETD reflects the necessary internal sources that can be used to address default risk. Accordingly, the higher the ratio, the safer a bank is. Therefore, the highest rank is attributed to a bank that has registered the highest score for these indicators.

The capital which banks hold with themselves as required by financial regulator is known as minimum capital requirement. Banks exposed to various types of risks while granting loans and advances to various sectors. In order to absorb any losses which banks face from its business, it is imperative that banks should have sufficient capital. If banks have adequate capital, then it can protect its depositors from unforeseen contingencies as well promotes the stability and efficiency of financial systems. Components of Capital Tier I Capital: The elements of Tier I capital includes paid-up capital (ordinary shares), statutory reserves, disclosed free reserves, Perpetual Non-cumulative Preference Shares (PNCPS) subject to laws in force from time to time, Innovative Perpetual Debt Instruments (IPDI) and capital reserves representing surplus arising out of sale proceeds of asset. It is generally referred as the core capital which absorbs losses without a bank required to cease trading and thus provides more of protection to its depositors. Tier II Capital: The elements of Tier II capital include undisclosed reserves, revaluation reserves, general provisions

and loss reserves, hybrid capital instruments, subordinated debt and investment reserve account. It is the supplementary capital which absorbs losses in the event of winding up and thus provides lesser degree of protection to its depositors.

Tier II items qualify as regulatory capital to the extent that they absorb losses arising from bank's activities. Tier III Capital: This is arranged to meet part of market risk, viz. changes in interest rate, exchange rate, equity prices, and commodity prices. To quantify as Tier III capital, assets must be limited to 250% of a bank's Tier I capital, be unsecured subordinated and have a minimum maturity of 2 years. Capital Adequacy: A Financial Soundness Indicator for Banks. Capital Adequacy Ratio (Car) Capital adequacy ratio is the ratio which protects banks against excess leverage, insolvency and keeps them out of difficulty. It is defined as the ratio of banks capital in relation to its current liabilities and risk weighted assets. Risk weighted assets is a measure of amount of banks assets, adjusted for risks. An appropriate level of capital adequacy ensures that the bank has sufficient capital to expand its business, while at the same time its net worth is enough to absorb any financial downturns without becoming insolvent. It is the ratio which determines banks capacity to meet the time liabilities and other risks such as credit risk, market risk, and operational risk.

Asset Quality

Asset quality is used to assess the strength of a bank and is directly linked to capital adequacy because insolvency risk is accompanied by the deterioration of the bank's assets (IMF and World Bank 2005). Following prior studies, we use the ratio of loan loss provisions to total loans (LLPTL), the ratio of loan loss provisions to net interest income (LLPII), and the ratio of total loans to total assets (TLTA), LLPTL represents the proportion of risky loans to total loans that were granted to the borrowers. LLPII indicates the ability of a bank to use the received interest income in order to cover the expenses caused by provisions for impaired loans. Accordingly, the lower value of LLPTL or LLPII, the better the quality of loans is. Also, a higher TLTA reflects the more sensitivity of assets structure to loan losses since loans represent the most important components of a bank's assets (Le 2016). Thus, the highest rank is attributed to a bank that has registered the lowest value of these indicators.

Profitability

Profitability can be measured by the following indicators return on assets (ROA) return on equity (ROE) and net interest margins (NIM). ROA, as measured by the ratio of profit before tax to total assets. ROE, as measured by the ratio of profit before

tax to total equity reflects the profitability of a bank own capitals. NIM, as measured by the ratio of net interest income to interest-bearing assets. Accordingly, the higher value of ratio the better performance a bank has. Consequently, the highest rank is assigned to a bank that can obtain the highest the value of these indicators.

Liquidity

Liquidity reflects the ability of a bank to withstand shocks to cash flows and unexpected withdrawals of depositors. Following prior studies, use the ratio of liquid assets to the short-term funding, (LASTF) and the ratio of net loan to the short-term funding (NLSTF) as measures of bank liquidity. The higher LASTF the safer the bank is since banks hold more liquid assets that can be utilized to address the short-term debt. As a result, the highest rank is assigned to a bank that can acquire the greatest value of LASTF. However, the higher NLSTF the less stable the bank is since loans are generally considered illiquid assets. If the bank advances higher volume of loans, that bank may face liquidity problem to meet the unexpected withdrawals of depositors. The period of 2008 and 2010 witnessed a rapid growth in loans, especially in the booming real estate and stock markets rather than into productive investments. Consequently, this may affect the liquidity status of a bank. The highest rank is assigned to a bank that has registered the lowest value of LASTF.

Table 2.1: Indicators of Banking System Stability Index for Nigeria

<i>Category</i>	<i>Indicator</i>	<i>Notation</i>
1. Banking Soundness Index		
Capital Adequacy	Capital Adequacy Ratio	CAR
	Ratio of Non-Performing Loans net of Provisions to Capital	NPLP/C
Asset Quality	Ratio of Non-Performing Loans to Total Loans	NPL/TL
Liquidity	Ratio Liquid Assets to Total Assets	LA/TA
	Loans to Deposits Ratio	TL/D
Profitability	Return on Assets	ROA
	Interest Margin to Gross Income Ratio	NIM
	Non-Interest Expense to Gross Income	NIE/GI
2. Banking Vulnerability Index		
External Sector	Current Account Balance to GDP Ratio	CAB/GDP
	Ratio of Money Supply to Foreign Reserves	M2/FR
	Ratio of External Assets to Total Assets of DMBs	EA/TA
	Ratio of Foreign Currency Assets to Foreign Currency Liabilities of DMBs	FCA/FCL

<i>Category</i>	<i>Indicator</i>	<i>Notation</i>
Financial Sector	DMBs Domestic Credit to GDP	DC/GDP
Real Sector	Inflation	IF
	GDP Growth Rate	GDPR
3. Economic Climate Index		
	GDP Growth Rate of the US	GDPUS
	GDP Growth Rate of the UK	GDPUK
	GDP Growth Rate of China	GDPCH

Source: IMF, 2007

(b) Financial stability index

Table 2.2 Financial Soundness Indicators: The Core and Encouraged Sets

<i>Core Set</i>	
<i>Deposit-Takers</i>	
Capital adequacy	Regulatory capital to risk-weighted assets
	Regulatory Tier 1 capital to risk-weighted assets
	Nonperforming loans net of provisions to capital
Asset quality	Nonperforming loans to total gross loans
	Sectoral distribution of loans to total loans
Earnings and profitability	Return on assets
	Return on equity
	Interest margin to gross income
	Noninterest expenses to gross income
Liquidity	Liquid assets to total assets (liquid asset ratio)
	Liquid assets to short-term liabilities
Sensitivity to market risk	Net open position in foreign exchange to capital
<i>Encouraged Set</i>	
Deposit-takers	Capital to assets
	Large exposures to capital
	Geographical distribution of loans to total loans
	Gross asset position in financial derivatives to capital
	Gross liability position in financial derivatives to capital
	Trading income to total income
	Personnel expenses to noninterest expenses
	Spread between reference lending and deposit rates
	Spread between highest and lowest interbank rate
	Customer deposits to total (noninterbank) loans
	Foreign-currency-denominated loans to total loans
	Foreign-currency-denominated liabilities to total liabilities
	Net open position in equities to capital

Other financial corporations	Assets to total financial system assets
	Assets to gross domestic product
Nonfinancial corporations sector	Total debt to equity
	Return on equity
	Earnings to interest and principal expenses
	Net foreign exchange exposure to equity
	Number of applications for protection from creditors
Households	Household debt to gross domestic product
	Household to debt service and principal payments to income
Market liquidity	Average bid-ask spread in the securities market
	Average daily turnover ratio in the securities market
Real estate markets	Residential real estate prices
	Commercial real estate prices
	Residential real estate loans to total loans
	Commercial real estate loans to total loans

Source: International Monetary Fund. 2006. Financial Soundness Indicators Compilation Guide. www.imf.com/external/pubs/ft/fsi/guide/2006/index.htm

Financial Intermediation Theory

Traditional theories of intermediation are hinged on transaction costs and information asymmetry, describing how institutions collect deposits or issue insurance policies and channel funds to individuals and businesses. However, over the years, the business of intermediation has evolved significantly, with declines in transaction costs and asymmetric information, but intermediation has increased (Allen & Santomero, 1998). Allen and Santomero (1998) in their work *The Theory of Financial Intermediation* suggested that the theories of intermediation need to be adjusted to account for substantial transformation in financial systems across various countries. Over the study period, many traditional financial markets expanded and new markets emerged, transaction cost decreased, and information became cheaper and more available. Despite these changes/transformations, the business of intermediation has not declined. Financial Intermediation theory focuses on how banks mitigate transaction costs and deal with issues stemming from information asymmetry between lenders and borrowers. This foundational perspective of financial intermediation is primarily attributed to the seminal work of Diamond and Dybvig (1983). They developed a model illustrating how banks as intermediary transform illiquid assets (loans) into liquid liabilities (demand

deposit), therefore providing liquidity to the economy by meeting the liquidity preferences of depositors, through the process of maturity transformation.

Buffer Theory of Capital Adequacy

Buffer theory was propounded by Calem and Rob (1996) in their article the impact of capital-based regulation on bank risk-taking: a dynamic model. The theory states that banks tend to hold a buffer of extra capital beyond the regulatory minimum capital requirement in order to avoid or minimize the risk of declining below the required capital adequacy ratio. This act, serves as a safety net for banks to avoid possible regulatory penalties that may arise from breaching capital requirements. Thus, the theory opines that banks seek to maintain a buffer of excess capital to avoid probability of falling below the minimum capital requirement, particularly if capital adequacy ratio is very volatile (Ikpefan, 2013). Calem and Rob (1996) suggest that banks with a capital higher than the minimum required capital will be less likely to take up excessive risks because they are not pressured to meet the minimum regulatory capital requirement, while undercapitalized banks are tempted to take on more risk in order to achieving more returns to restore their capital position. This theory shows relationship between regulatory capital requirements and bank risk-taking behaviors. This behavior has direct implications for financial soundness and bank performance of any economy. When a bank maintains adequate capital buffers, it enhances the bank's resilience against potential losses, thereby promoting financial stability.

Demand Following Hypothesis

Moving away from the neo-classical state equilibrium analysis, to a highly developed financial system, consisting of financial intermediaries, leads to a demand following phenomena (Patrick, 1960). Under this, in response to the demand from real economy, there are the development of modern financial institutions, their financial assets and liabilities, and related financial services. This model postulates that the developments of the real economy will in itself induce increase in demand for financial services. The increase demand for financial services will spontaneously generate or lead to the introduction of new financial institutions and markets which will satisfy that increased demand for financial services. This Theory is important to this study as it provides a different view that the developments in financial deepening does not necessarily lead to economic growth. It also provides an alternative explanation suggesting that economic growth drives deepening of the financial sector.

The demand-following view of the deepening of the financial markets is merely a lagged response to economic growth (growth generates demand for financial products). This implies that any early efforts to develop financial markets might lead to a waste of resources which could be allocated to more useful purposes in the early stages of growth. As the economy advances, this triggers an increased demand for more financial services and thus leads to greater financial deepening. The demand-following pattern should be expected to establish a causality that runs from growth to finance at a later stage of development. More advanced economies may accordingly be expected to exhibit this direction of causality (Agu & Chukwu, 2008).

EMPIRICAL REVIEW

Yusuf and Olaniran-Akinyele (2019) used return on asset and return on equity to measure deposit money bank performance while credit granted to private sector, market capitalization and total bank deposit as ratio of GDP were the study's variables for financial deepening. They adopted analytical tools of ARDL bound test, cointegration, unit root as well the descriptive statistics in their analysis. They observed through their ARDL analysis that market capitalization ratio to GDP was indirect and significant in long run but direct and significant in short run. They explained further that long run analysis result revealed credit granted to the private sector ratio to GDP and ROA indicates indirect and insignificant relationship and concluded financial deepening to affect financial performance of commercial bank in Nigeria. In a study aimed at examining financial deepening effect on financial performance of Nigeria deposit money bank,

Macharia and Mungai (2021) adopted the descriptive research design the 43 commercial banks in Kenya as their case study. Analytical tools employed by the study includes; descriptive statistics, correlation analysis and the Analysis of Variance (ANOVA). Variables of financial deepening employed by the study include; interest rate, government policies and access to bank deposit. The results of the study revealed interest rate insignificantly and negatively impact financial Kenya's commercial bank performance while government policies and access to bank deposit had a positive and significant impact on financial performance of commercial banks in Kenya. They concluded that all variables except interest rate positively and significantly affect Kenya's commercial bank financial performance.

Ozili and Ndah (2022) collected Nigerian data of global financial indicators through world bank data base for 20 years (1996-2016). Their measure for bank

profitability was net interest margin and asset and equity returns while the bank efficiency ratio, regulatory capital ratio and ratio of non-performing loans. They employed the descriptive statistics and correlation as well as the regression analysis with emphasis on robust ordinary least square and the generalized method of moment and reported a negative association among financial system deposit ratio and net interest margin of Nigerian banks which implies that the larger the size of Nigerian financial system, the lower the bank profitability in Nigeria and that all explanatory variables used were significant determinant of bank profitability in Nigeria.

Samuel-Hope, Ehimare and Osuma (2020) examined financial deepening impact on Nigeria's economic growth and used money supply, credit granted to private sector and savings and times deposit all as ratios of GDP while growth was proxied by GDP. They obtained data from central bank of Nigeria statistical bulletin from 1981 to 2018 and used ARDL for their analysis. They reported a long-run association among financial deepening and Nigeria's economic growth and an insignificant association between financial deepening and economic growth. Ndife and Egungwu (2022) examined financial deepening effect on small and medium scales enterprise performance in Nigeria and sourced secondary data from CBN statistical bulletin and employed descriptive statistics, unit root and the ordinary least square regression technique as their analytical tool. They reported money supply and credit granted to private sector as ratios of GDP to significantly show positive impact on Small and medium scales enterprise performance and concluded financial deepening to have positive impact on retail trading which was their proxy for Small and medium scales enterprise performance.

Galeed and Nwaoha (2023) aimed at determining the financial deepening impact on commercial bank performance in Nigeria. Financial deepening was decomposed into credit allocation to private sector as a ratio of GDP, money supply as a ratio of gross domestic product and total loan to deposit ratio while net interest margin was used as proxy for commercial bank performance. Data was sourced from the CBN statistical bulletin and the World Bank data base from 2000 to 2022. The Augmented Dickey Fuller unit root test was used in determining stationarity of the data which were not stationary after first differencing hence giving room for the application of the ARDL bond test to determine the short and long run relationship between the implicated variables while the Granger causality test was used to determine the causality between financial deepening and commercial bank

performance. The results revealed nonexistence of short run relation but existence of long run relationship was observed while a unidirectional relation between credit allocated to private sector ratio to GDP and net interest margin why no causality was recorded between other variables studied. The work recommends need for commercial banks to improve on their financial deepening activities so as to broaden their financial services operations and more so, policy makers should step in and ensure commercial banking broaden their financial deepening to accommodate individuals and the business world entirely.

Sit (2022) examined the effect of the financial soundness index on the financial performance of banks in Turkey, using annual data from 2005 to 2019 for 11 banks listed in the BIST Bank Index. The study reveals a bi-directional relationship between banking strength index and market value, as well as a unidirectional causality from profitability ratios to the banking strength index. Muhadzdzib and Leon (2022) explored the effect of financial soundness on financial performance of banks listed on the Indonesia Stock Exchange (IDX). The study shows that capital adequacy, asset quality, income quality, and liquidity wield significant positive effect on financial performance, whereas efficiency management has a significant negative effect on financial performance. Afrin et al. (2022) in their study to evaluate financial stability and soundness of the banking sector in Bangladesh show that variables like Capital Adequacy (CRAR), Asset Quality (NPL), Profitability (ROA & ROE) and Liquidity (LCR & NSFR) which are used as measures of banking soundness reflect significant variability among different groups of banks. Mohammed et al. (2022) focus on analyzing financial strength using the profitability indicator and its impact on achieving financial soundness in selected commercial banks in Iraq.

Arzova and Sahin (2023) investigated the impact of financial soundness variables on bank performance in MSCI emerging countries, and the empirical study results show that non-performing loans to total gross loans negatively impact return on assets (ROA) and return on equity (ROE), while regulatory capital to risk-weighted assets has a negative effect on ROE. Non-interest expenses to gross income significantly and negatively affect Bank Z-Scores, while inflation, foreign direct investment, and GDP enhance bank profitability. Shah and Tiwari (2023) performed CAMEL analysis on commercial banks in Nepal to assess financial soundness, of which the results show commendable performance in various components of the CAMELS framework, reflecting a predominantly robust and stable banking sector.

In Nigeria, the relationship between financial soundness and bank performance has been investigated by numerous researchers.

Yakubu et al. (2020) applied autoregressive distributed lag approach to investigate the link between financial soundness of the banking sector and macroeconomic performance in Nigeria, using quarterly data from 2007Q1 to 2018Q4, and find that financial soundness indicators are significantly linked to macroeconomic variables, thus, making them effective in preventing financial crises in Nigeria. Ozili (2024) on the impact of financial stability on the economic growth of Nigeria confirms a positive relationship between financial stability and economic growth in Nigeria. Oseni (2024) examines the soundness of 13 Nigerian deposit money banks (DMBs) in relation to stakeholders' increasing dependence on bank soundness as a catalyst for achieving individual and corporate prosperity, such as, wealth, access to funding, improved standard of living, etc., over the period of 10 years from 2013 to 2022. The study reveals soundness and healthiness of all banks except one bank that has a negative S-score indicating a critical state of distress.

Udofia and Okhae (2024) applied the discriminant (Z-score) technique and regression analysis to evaluate the effect of Capital Adequacy, Asset Quality, and Management Quality, Earnings Quality, and Liquidity Efficiency (CAMEL) variables on the financial health conditions of selected banks in Nigeria, using data from 2012 to 2021. The study reveals that capital adequacy and liquidity sufficiency are insignificant predictors of a bank's financial health, while, assets quality, management quality, and earnings quality significantly predict the banks financial health in Nigeria, suggesting that CAMEL indicators significantly predict bank financial health in Nigeria. Efanga, Ogochukwu and Ugwuanyi (2020) investigated the impact of financial deepening on the Nigerian economy between 1981 and 2018. Data employed for this study was obtained from Central Bank of Nigeria Statistical Bulletin. This study employed real gross domestic product as proxy for economic growth in Nigeria, while ratio of money supply to gross domestic product, ratio of private sector credit to gross domestic product and ratio of market capitalization to gross domestic product were adopted as regressors. The co-integration test and Fully Modified Least Squares (FMOLS) Model were utilized to analyze data. Inferential results generated indicated that financial deepening had positive impact on the Nigerian economy within the period under review. Eke, Okoye and Evbuomwan (2020) carried out a study on entrepreneurship and financial deepening in selected African economies from 1995- 2014 and evidence from the augmented Toda-

Yamamoto technique, the result shows that human capital does not have long run causal effect on entrepreneurship, and financial deepening.

Yousuo and Ekiou (2020) investigated the impact of financial deepening on economic growth in Nigeria for a period of thirty-eight years from 1981 to 2018, with four specific objectives; examining the effects of the monetized, credit, savings and stock markets criteria on the economic growth taking cognizance of the impact of administrative regimes. Time series data were employed sourced from the Central Bank of Nigeria statistical bulletin of 2018 edition, the classical least square of multiple regressions with the application of dummy variable to capture the effects of the various Regimes was adopted in analyzing the data. The results show that financial deepening has both short and long-term effects on economic growth, the 56 Effect of Financial Deepening on Economic Growth in Nigeria estimated regression line is significance as confirmed by the f-statistics. The stock market, credit criteria have positive and significant effect on economic growth, savings criteria has negative and significant effects on economic growth, while the monetized criteria have positive and insignificant effects on growth in the short run.

Igwebuike, Udeh and Okonkwo (2019) examined effects of financial deepening on the economic growth of Nigeria (1981 to 2016) through two of the basic arms of the financial industry (Insurance companies and Banking Industry). Secondary data from CBN statistical bulletin and Global Financial Development bulletin, 2017 as provided by the World Bank were utilized. The study adopted an ex-post facto research design. The analytical tool used was Ordinary Least Squares (OLS). It was found that insurance industry premium to GDP has positive but no significant effect while credit to private sector by commercial banks to GDP has positive and significant effect on economic growth in Nigeria. Amaefula (2019) evaluated if economic growth was enhanced by financial deepening. The variables employed in the study were gross domestic product (GDP), money supply (M2) and credit to private sector (CPS). This study covered the period between 1981 and 2016. Multiple regression analysis model and Auto-Regressive Distributed Lag (ARDL) Model results showed that financial deepening indicators had no effect on economic growth but when they considered the pooled additive effect on economic growth, it was discovered to have a positive and significant effect at 1% level of significance. The ARDL result revealed that there was no evidence of short-run relationship that existed between financial deepening and economic growth, but the long-run equilibrium relationship was recorded to be only significant at 10% level of significance.

Nwolisa and Cyril (2019) examined the impact of financial deepening on the growth of Nigerian -economy 1990-2016. The main objective of this study is to evaluate the effect of private sector credit, money supply and market capitalization on economic growth in Nigeria. The sources of data for this study are CBN statistical Bulletin and National Bureau of Statistics. The data obtained were analyzed using ordinary least square regression (OLS). The result of the analyses showed that the three independent variables of the study all have significant effect on Nigerian financial deepening. Ogbonna (2018) examined the impact of financial deepening on economic growth in Nigeria between 1970 and 2015, using Vector Error Correction Model, Impulse Response Function, and Forecast Error Variance Decomposition, with a distinction between size and activity variables of financial deepening. The results show that financial deepening and economic growth have a stable long-run relationship, and that activity variables of the financial deepening have more stimulating effect on economic growth than the size variables.

Werigbelegha and Ogiriki (2018) investigated the relationship between financial deepening and the growth of Nigerian economy; for the period (1990-2017). The study used Gross Domestic Product as proxy for growth of Nigerian economy and employed as dependent variable; Total Bank deposits, Market Capitalization and Credit to the Private Sector were used as the explanatory variables to measure financial deepening. Hypotheses were formulated and tested using timeseries econometrics model. The study concluded that financial deepening had a causal relationship with the growth of Nigerian economy. John and Ibenta (2017) examined the relationship between financial deepening and entrepreneurial growth in Nigeria from 1986 to 2016. The study employed Pearson Correlation in establishing relationships between the variables. The results revealed that the ratio of money supply to Gross Domestic Product ($M2/GDP$) has a positive but not significant relationship with entrepreneurial growth; the ratio of credit to private sector to GDP (CPS/GDP) has a positive (not significant) relationship with entrepreneurial growth; and the ratio of deposit money banks' branches to GDP ($DMBB/GDP$) has a negative and significant relationship with entrepreneurial growth. In view of this, study showed that money supply and credit to private sector are better indicators of financial deepening that can affect entrepreneurial growth positively in Nigeria.

Akani (2019) examined the effects of credit expansion on commercial banks soundness in Nigeria. The objective was to ascertain the relationship between credit expansion and commercial banks soundness in Nigeria. Time series data was collected

from Central Bank of Nigeria statistical bulletin and stock exchange factbook. Ordinary least square method was used as data analysis method. Model I had capital adequacy indicator was modeled as the function of bank credit to manufacturing sector, communication and transport, mining and quarrying, agricultural sector and credit to small and medium scale enterprises while model II modeled capital adequacy indicator as the function of credit to private sector, net domestic credits, medium term credits, short term credits and long term credits. From the findings, Model I found that the independent variables explained 77 percent variations on capital adequacy ratio. The beta coefficient found that all the independent variables have positive effects on bank capital adequacy except credit to manufacturing sector. Model II found that the independent variables can explain 81 percent variations on capital adequacy while the beta coefficient found that all the independent variables have positive effects except medium term credit. The study concludes that credit expansion significantly relates to commercial banks soundness in Nigeria. Amida and Chindengwike (2021) examined the relationship between Asset Quality and Financial Performance of Commercial Banks Before and After Shifting Capital City Located to Dodoma Region, covering time periods of 2010-2020. A total of 3 commercial banks constituted the sample size with 120 observations. The findings show that there is a relationship between asset quality and financial performance and recommended that international financial organizations and policymakers to supervise the operations of commercial banks to increase asset quality.

Abdulai et al (2021) examined financial soundness of banks in Nigeria using the CAMELS frame work and OLS regression method was the statistical tool used. The result showed that in the measurement of capital adequacy, gross revenue ration and leverage asset quality is relevant in the determination of capital adequacy which is essential in the growth of any economy. Abiodun, Alao and Yunusa (2020) examined the determinants of Capital Adequacy of Nigerian Banks by using data from 2007 to 2017. The study employed least square regression and found that ROA and loan to total assets are significantly associated with capital adequacy while non-performing loans and size are negatively associated with the capital adequacy. Ofeimu, (2020) investigated the effect of capital adequacy on banks performance in Nigeria between 2010 and 2019, using descriptive, correlation statistic and regression analysis. The outcome indicated that loans and advances and shareholder's funds are positively and significantly associated with financial institutions performance in Nigeria which by implication can have impact on economic growth.

Olalekan and Adeyinka (2019) examined the effect of capital adequacy on profitability of deposit taking banks in between 2006 to 2017. The research instrument used was questionnaires as well as secondary data which were analyzed with percentage and the OLS regression for the primary and secondary data respectively. The study found that there is no significant relationship between capital adequacy and profitability but the regression result revealed a positive and significant relationship between capital adequacy and profitability of deposit taking banks in Nigeria. Halit et al (2019) conducted study on the effects of capital adequacy on the return on asset in commercial banks in Kosovo between 2008 – 2017. It employed fixed effect panel least square regression and found that capital adequacy has a positive and significant impact on return on assets.

Gaps in Literature

There are many variables that are exogenous that affect the soundness of the banking industry. In this study, the research focused on the effect of monetary policy on commercial bank soundness while other studies focused on financial deepening and commercial banks profitability. Various studies have been done on bank soundness (Kauffman & Wang, 2003, Marston & Basu, 2001, Barth *et al.*, 2001, Ghosh, 2010; and Sere-Ejembi et al, 2014). Akani and Lucky (2015) examined capital adequacy ratios and commercial bank profitability in Nigeria. The relationship of the variables is still debatable among different researchers, which might be due to macroeconomic and monetary policy factors. Thus, these debates can only be resolved through quantitative analysis of the variables. Besides, most of the related literatures reviewed covered different studies made both in developing and developed countries, to the knowledge of the researcher, there is no study on bank soundness that have disaggregated the bank operating environment as this study examined. This study therefore seeks to fill this gap by determining financial deepening variables that determine commercial bank soundness among in Nigeria.

METHODOLOGY

This study used quasi-experimental research design approach for the data analysis. This approach combines theoretical consideration (a prior criterion) with the empirical observation and extract maximum information from the available data. The data is cross sectional time series was collected from the Central Bank of Nigeria statistical bulletin, Stock Exchange factbook and financial statement of commercial

banks in Nigeria. The population is further pruned to a sample of 14 banks as the study is focused on Banks that are listed on the floors of the Nigeria Exchange Group. The rationale for the sample size the relative ease in getting relevant and reliable data for the study from the annual reports submitted to the exchange.

Model Specification

The following models are specified to achieve the objectives of this study:

Models

$$BS = \beta_0 + FD + \epsilon_i \quad (1)$$

Where:

BS = Banking Soundness

FD = Financial deepening

ϵ_i = Error Term of the model

Disaggregating Equation I

CBI = f(CPS, M3/GDP, IRS, MCR, FMD) (2)

AQI = f(CPS, M3/GDP, IRS, MCR, FMD) (3)

LIQ = f(CPS, M3/GDP, IRS, MCR, FMD) (4)

$$CBI = \beta_0 + \beta_1 CPS_{it} + \beta_2 M3/GDP_{it} + \beta_3 IRS_{it} + \beta_4 MCR_{it} + \beta_4 MCR_{it} + \mu_{it} \quad (5)$$

$$AQI = \beta_0 + \beta_1 CPS_{it} + \beta_2 M3/GDP_{it} + \beta_3 IRS_{it} + \beta_4 MCR_{it} + \beta_4 MCR_{it} + \mu_{it} \quad (6)$$

$$LIQ = \beta_0 + \beta_1 CPS_{it} + \beta_2 M3/GDP_{it} + \beta_3 IRS_{it} + \beta_4 MCR_{it} + \beta_4 MCR_{it} + \mu_{it} \quad (7)$$

Where:

CBI= Capital adequacy indicator of bank soundness

AQI = assets quality indicator of bank soundness

LIQ = liquidity indicator of bank soundness

CPS = Credit to Private Sector as percentage of Gross Domestic Product

M3/GDP = Broad Money Supply as percentage of Gross Domestic Product

IRS = Interest Rate Spared as the difference between lending and deposit rate

MCR= Market Capitalization Ratio as the percentage of market capitalization to Gross Domestic Product

FMD = Financial market depth as total market instrument to gross domestic product

β_0 = Regression Intercept

$\beta_1 - \beta_5$ = Coefficient of the Independent to the Dependent Variables

Techniques of Data Analysis

The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test. The technique used in this study is the Ordinary Least Square (OLS) estimation technique. The test instruments in the OLS are the T-statistics and F-test which were used to test the significance of variables and the overall significance of the regression respectively. Other test instruments also employed were the Durbin Watson test which was used to test the presence or absence of auto correlation between and among the explanatory variables and the adjusted R square used to test the percentage variation of the dependent and the independent variables. To achieve the stated objective, the collected time series data will be analyzed using descriptive statistics, correlation matrix and multiple linear regression analysis. The descriptive statistics (Mean values and standard deviations) used to analyze the general trends of the data from 2014-2023 based on the sample of 14 commercial banks. The rational for choosing OLS is that, if the Classical Linear Regression Model (CLRM) assumptions 5 hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (Brooks 2008). In addition, as noted in Petra (2007) OLS outperforms the other estimators when the following holds; the cross section is small and the time dimension is short.

Pooled Regression (OLS) Model (PRM): is equally known as the constant coefficient model (CCM). It is the simplest among the three models in panel data analysis. However, it disregards the space and the time dimensions of the pooled data. In a situation where there is neither significant cross-section unit nor significant temporal effects, one could pool all of the data and run an ordinary least squares (OLS) regression model.

Fixed Effects (FE) Model: in the FE technique, the slope coefficients, are constant but the intercept, varies across space i.e. the intercept in the regression

model is allowed to vary across space (individuals). This is as a result of the fact that each cross-sectional unit may have some special characteristics. In this case, N number of dummies is introduced, which will help to reduce the common intercept term. We stipulated that the error term should be independently and normally distributed with zero mean and constant variance and more importantly must not correlated with the independent variables pooled OLS linear regression is given as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \quad (3.6)$$

Where Y_{it} is the dependent variable; β_0 is a constant term; X_{1it} to X_{4it} are the independent variables; β_1 to β_4 are slope parameters; $i=1,2,\dots,n$ refer to the cross-sectional units and t is the time period.

Random Effect (RE) Model: the RE technique which is equally known as the Error Components Model (ECM) is an alternative to FE technique. Since there is no significant correlation between the unobserved units of observation, specific random effects and the regressors, the RE model may be more appropriate. In our case, this leads to the assumption that they α_i are random factors, independently and identically distributed over individuals. Thus we write the random effects model as

$$y_{it} = \mu + x_{it} \beta + \alpha_i + \varepsilon_{it}$$

Where $\alpha_i + \varepsilon_{it}$ is treated as an error term consisting of two components: an individual specific component, which does not vary over time, and a remainder component, which is assumed to be uncorrelated over time.

RESULTS AND DISCUSSION

Table 1: Financial Deepening and Capital Adequacy of Quoted Commercial Banks

Variable	FIXED EFFECT		
	β coefficient	T. stat	p. value
CBI	0.991565	60.42760	0.0000
CPS	0.187070	7.643978	0.0000
FMD	-0.008309	-0.447380	0.6556
IRS	-0.024719	-1.366413	0.1750
M3_GDP	0.149627	5.997023	0.0000
MCR	-0.004814	-2.454473	0.0159
C	0.515956	0.687320	0.4935
ECM(-1)	-0.990590	-53.56293	0.0000
R-squared	0.982406		

Variable	FIXED EFFECT				
	β coefficient	T. stat	p. value		
AdjR ²	0.978960				
F-statistic	285.0681				
F- Prob	0.000000				
DW	1.879321				
Correlated Random Effects - Hausman Test					
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random		126.46352	5	0.0000	

Source: Extracted by Researcher from E-View 9.0 (2025)

The Hausman test statistic is a transformation of difference between the parameter estimates from fixed effects and random effects estimation that becomes asymptotically χ^2 chi-square distributed under null hypothesis. The Hausman test is distributed as chi-square with 4 degree of freedom. From the table capital adequacy model show the probability of the cross section random effects was 0.0000 which is less than 0.05 implying that it's appropriate to adopt fixed effects model.

From the results of the fixed effect model, the model is significant at 5% level as the probability value was less than 0.05. The Durbin- Watson value was 1.879321 indicating that there was no autocorrelation problem. The Durbin-Watson value should be around 2, if the value of Durbin-Watson is below 1 then there is serial correlation. The value of R-squared was 0.978960 showing that financial deepening explains 97.8 percent variance in capital adequacy of the quoted commercial bank. The estimated regression coefficient for credit to private sector was 0.187070 shows that with influence of other explanatory variables held constant increase in one percent in credit to private sector makes capital adequacy ratio to increase by 0.18 percent. The estimated regression coefficient for financial market development -0.008309 shows that with influence of other explanatory variables held constant increase in financial sector development make capital adequacy ratio to reduce by 0.08 percent. Interest rate spread from has coefficients -0.024719 which imply that increase on the variable will make capital adequacy ratio to reduce by 0.2 percent. Money supply to gross domestic product has a positive coefficient of 0.149627 which implies that increase on the variable will make capital adequacy to increase by 0.14 percent while market capitalization ratio has a negative coefficient of -0.004814 which implies that increase on the variable will make capital adequacy to reduce by 0.004 percent.

Table 2: Financial Deepening and Assets Quality of Quoted Commercial Banks

Variable	RANDOM EFFECT MODEL		
	β coefficient	T. stat	p. value
CPS	0.221319	1.532137	0.1283
IRS	0.043053	0.486769	0.6274
M3_GDP	-0.194592	-1.378335	0.1709
MCR	0.015839	1.336111	0.1842
FMD	18.12802	3.988842	0.0001
C	0.869843	19.08682	0.0000
R-squared	0.741502		
AdjR ²	0.729858		
F-statistic	63.68068		
F- Prob	0.000000		
DW	2.343632		
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.117463	5	0.3945

Source: Extracted by Researcher from E-View 9.0 (2025)

The Hausman test is distributed as chi-square with 5 degree of freedom. From the table assets quality show the probability of the cross section random effects was 0.3945 which is greater than 0.05 implying that it's appropriate to adopt random effects model. From the results of the random effect model, the model is significant at 5% level as the probability value was less than 0.05. The Durbin- Watson value was 2.343632 indicating that there was no autocorrelation problem. The Durbin-Watson value should be around 2, if the value of Durbin-Watson is below 1 then there is serial correlation. The value of R-squared was 0.729858 showing that financial deepening explains 73.5 percent variance in assets quality of the quoted commercial banks.

The estimated regression coefficient for credit to private sector was 0.221319 shows that with influence of other explanatory variables held constant increase in one percent in credit to private sector makes assets quality to increase by 0.22 percent. The estimated regression coefficient for financial market development 18.12802 shows that with influence of other explanatory variables held constant increase in financial sector development make assets quality to increase by 18.1 percent. Interest rate spread from has coefficients 0.043053 which imply that increase on the variable will make capital assets quality to increase by 0.04 percent. Money supply

to gross domestic product has a positive coefficient of -0.194592 which implies that increase on the variable will make assets quality to reduce by 0.14 percent while market capitalization ratio has a negative coefficient of 0.015839 which implies that increase on the variable will make assets quality to increase by 0.001 percent.

Table 3: Financial Deepening and Liquidity of Quoted Commercial Banks

Variable	Fixed effect model		
	β coefficient	T. stat	p. value
CPS	0.240253	1.662695	0.0495
IRS	0.048008	0.542763	0.5885
M3_GDP	-0.168851	-1.195283	0.2348
MCR	0.015446	1.302954	0.1956
FMD	17.08523	3.755802	0.0003
C	0.360767	3.366002	0.0011
R-squared	0.741502		
AdjR ²	0.729858		
F-statistic	63.68068		
F- Prob	0.000000		
DW	2.343632		
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.036531	5	0.0045

Source: Extracted by Researcher from E-View 9.0 (2025)

From the table 3 the Hausman test is distributed as chi-square with 5 degree of freedom. From the table liquidity show the probability of the cross section random effects was 0.0045 which is less than 0.05 implying that it's appropriate to adopt fixed effects model. From the results of the fixed effect model, the model is significant at 5% level as the probability value was less than 0.05. The Durbin- Watson value was 2.343632 indicating that there was no autocorrelation problem (Garson, 2012; Alsaed, 2005). The Durbin-Watson value should be around 2, if the value of Durbin-Watson is below 1 then there is serial correlation. The value of R-squared was 0.729858 showing that financial deepening analysis explains 72.9 percent variance in liquidity of the quoted commercial banks. The estimated regression coefficient for credit to private sector was 0.240253 shows that with influence of other explanatory variables held constant increase in one percent in credit to private sector make liquidity of the commercial banks to increase by 0.24 percent. The estimated regression coefficient for financial market development 17.08523 shows

that with influence of other explanatory variables held constant increase in financial sector development make assets quality to increase by 17.0 percent. Interest rate spread from has coefficients 0.048008 which imply that increase on the variable will make liquidity to increase by 0.04 percent. Money supply to gross domestic product has a positive coefficient of -0.168851 which implies that increase on the variable will make liquidity to reduce by 0.16 percent while market capitalization ratio has a positive coefficient of 0.015446 which implies that increase on the variable will make liquidity to increase by 0.015 percent.

DISCUSSION OF FINDINGS

Financial Deepening and Capital Adequacy

The estimated regression model found that credit to private sector has a coefficient of 0.187070 which increase in one percent increases capital adequacy ratio to increase by 0.18 percent, financial market depth had a coefficient of -0.008309 which implies that with influence of other explanatory variables held constant increase in financial sector development make capital adequacy ratio to reduce by 0.08 percent. Interest rate spread from has coefficients -0.024719 which imply that increase on the variable will make capital adequacy ratio to reduce by 0.2 percent. Money supply to gross domestic product has a positive coefficient of 0.149627 which implies that increase on the variable will make capital adequacy to increase by 0.14 percent while market capitalization ratio has a negative coefficient of -0.004814 which implies that increase on the variable will make capital adequacy to reduce by 0.004 percent. The positive effect of the variables confirm the a-priori expectations of the study and in line with economic reforms such as the deregulation of the economy and the various reforms the financial sector. The findings concur with the findings of Sit (2022) whose findings reveals a bi-directional relationship between banking strength index and market value, as well as a unidirectional causality from profitability ratios to the banking strength index, the findings of Muhadzdzib and Leon (2022) that capital adequacy, asset quality, income quality, and liquidity wield significant positive effect on financial performance, whereas efficiency management has a significant negative effect on financial performance, supported the findings of Afrin et al. (2022) that variables like Capital Adequacy (CRAR), Asset Quality (NPL), Profitability (ROA & ROE) and the findings of Arzova and Sahin (2023) that non- performing loans to total gross loans negatively impact return on assets (ROA) and return on equity (ROE), while regulatory capital to risk-weighted assets has a negative effect on ROE.

Financial Deepening and Assets Quality of the Quoted Commercial Banks

The estimated regression coefficient for credit to private sector was 0.221319 shows that with influence of other explanatory variables held constant increase in one percent in credit to private sector makes assets quality to increase by 0.22 percent. The estimated regression coefficient for financial market development 18.12802 shows that with influence of other explanatory variables held constant increase in financial sector development make assets quality to increase by 18.1 percent. Interest rate spread from has coefficients 0.043053 which imply that increase on the variable will make capital assets quality to increase by 0.04 percent. Money supply to gross domestic product has a positive coefficient of -0.194592 which implies that increase on the variable will make assets quality to reduce by 0.14 percent while market capitalization ratio has a negative coefficient of 0.015839 which implies that increase on the variable will make assets quality to increase by 0.001 percent. The positive effect of the variables is in line with the expectations of the study and in line with bank management theories. The negative effect of the variable could be traced to macroeconomic shocks such as wide economic illiquidity. The findings further confirm the findings of Shah and Tiwari (2023), Torbira and Zaagha (2016) that capital adequacy strongly and actively stimulates and improves the financial performance of banks in Nigeria. Fapohunda and Eragbhe (2017) that financial soundness tremendously impacts bank performance in both the short run and long run, findings of Jesuwunmi et al. (2019) that capital adequacy, leverage, and liquid asset ratios are significant determinants of banks' return on assets, asset quality, expense-revenue ratio, and return on equity in Nigeria, where leverage ratios and liquid assets have positive impact on all banks' financial performance indicators, while capital adequacy ratio has negative significant impact on all banks' financial performance indicators except returns on asset.

Financial Deepening and Liquidity of the Quoted Commercial Banks

From the estimated regression model, coefficient for credit to private sector was 0.240253 shows that with influence of other explanatory variables held constant increase in one percent in credit to private sector make liquidity of the commercial banks to increase by 0.24 percent. The estimated regression coefficient for financial market development 17.08523 shows that with influence of other explanatory variables held constant increase in financial sector development make assets quality to increase by 17.0 percent. Interest rate spread from has coefficients 0.048008 which

imply that increase on the variable will make liquidity to increase by 0.04 percent. Money supply to gross domestic product has a positive coefficient of -0.168851 which implies that increase on the variable will make liquidity to reduce by 0.16 percent while market capitalization ratio has a positive coefficient of 0.015446 which implies that increase on the variable will make liquidity to increase by 0.015 percent. The empirical findings in this study confirm the findings of Awonuga et al (2021) whose findings reported a mixed result which revealed financial deepening to have significantly impact on the performance indicators employed for deposit taking banks, Onipe et al (2015) revealed money supply to have positive significant impact on Nigeria economy while credit granted to private sector showed significant negative impact on economic performance of Nigeria, Macharia and Mungai (2021) revealed interest rate insignificantly and negatively impact financial Kenya's commercial bank performance while government policies and access to bank deposit had a positive and significant impact on financial performance of commercial banks in Kenya. The findings of Oluwumi, Lateef and Oladeji (2017) that the contribution of each variables of financial deepening selected were strong and statistically significant when related to performance of commercial bank and the findings of Ozili and Ndash (2022).

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study was motivated to examine the effect of financial deepening on commercial banks soundness. From model one, the study adopted the fixed effect model, The Durbin- Watson value was 1.879321 which implies that there was no autocorrelation problem. The value of R-squared was 0.978960 showing that financial deepening explains 97.8 percent variance in capital adequacy of the quoted commercial bank. From model two, the study adopted the random effect model. From the results of the random effect model, the model is significant at 5% level as the probability value was less than 0.05. The Durbin- Watson value was 2.343632 indicating that there was no autocorrelation problem, value of R-squared was 0.729858 showing that financial deepening explains 73.5 percent variance in assets quality of the quoted commercial banks while fixed effect was used in model three, The value of R-squared was 0.729858 showing that financial deepening analysis explains 72.9 percent variance in liquidity of the quoted commercial banks.

From the findings, the study concludes that Private Sector Credit as percentage of gross domestic product has significant effect on quoted commercial banks capital adequacy in Nigeria, concludes that Private Sector Credit as percentage of gross domestic product has no significant effect on quoted commercial banks assets quality in Nigeria, concludes that Private Sector Credit as percentage of gross domestic product has no significant effect on quoted commercial banks liquidity in Nigeria. Evidence from the findings, the study concludes that Ratio of Broad Money Supply as percentage of gross domestic product has no significant effect on quoted commercial banks capital adequacy in Nigeria, that Ratio of Broad Money Supply as percentage of gross domestic product spread has no significant effect on quoted commercial banks assets quality in Nigeria, that Ratio of Broad Money Supply as percentage of gross domestic product has no significant effect on quoted commercial banks liquidity in Nigeria.

From the findings, the study concludes that interest rate has no significant effect on quoted commercial banks capital adequacy in Nigeria, that interest rate spread has no significant effect on quoted commercial banks assets quality in Nigeria, that interest rate spread has no significant effect on quoted commercial banks liquidity in Nigeria, that Market Capitalization Ratio as percentage of market capitalization has significant effect on quoted commercial banks capital adequacy in Nigeria, that Market Capitalization Ratio as percentage of market capitalization has no significant effect on quoted commercial banks assets quality in Nigeria, that Market Capitalization Ratio as percentage of market capitalization has no significant effect on quoted commercial banks liquidity in Nigeria, that financial market depth has no significant effect on quoted commercial banks capital adequacy in Nigeria, that financial market depth has significant effect on quoted commercial banks assets quality in Nigeria, that financial market depth has no significant effect on quoted commercial banks liquidity in Nigeria

Recommendations

- Government should ensure that macroeconomic policies such as interest rate through money supply are properly managed in a manner that it will enhance commercial bank capital adequacy ratios.
- There is need for efficient management of exchange, inflation and interest rates in such a way to stimulate the financial market that cushion the volatility of macroeconomic variables to enhance commercial banks capital adequacy.

- That foreign exchange rate could be maintained at a low rate if there is a consistent growth in commercial bank capital adequacy. Domestic monetary and macroeconomic policies should be formulated to control hyperinflation in the economy to encourage savings, investment as this can enhance commercial banks policies and increase commercial banks capital adequacy.
- The macroeconomic environment and policies should be revisited, existing policies that threaten investment and the financial market should be abolished and new policies that will enhance economy growth should be formulated for effective management of commercial banks for increase capital adequacy.
- Macroeconomic policies should be directed towards increasing the operational efficiency of Nigeria banking industry for increase in commercial capital adequacy against monetary and macroeconomic shocks.

REFERENCES

- Agu, C.C. & Chukwu, J.O. (2008). Toda and Yamamoto Causality Tests between “Bank Based” Financial Deepening and Economic Growth in Nigeria. *European Journal of Social Science*, 7, 189-198.
- Akani, H. W. (2019). Effects of cross border banking on growth of deposit money banks in Nigeria. *International Journal of Interdisciplinary Research Methods*, 6(5), 1-26.
- Akani, H.W., & Lucky, A. L., (2015). Econometrics Analysis of Capital Adequacy and the Impact on Profitability of Commercial Banks in Nigeria. *IOSR Journal of economics and finance*, 6(6), 11-24.
- Akhator, A. P. & Marcus, G. O. (2018). Financial deepening and economic development of Nigeria: an empirical investigation. *Veritas International Journal of Entrepreneurship Development*, 1(1), 125-139.
- Allen, F., & Gale, D. (2004). Financial contagion. *Journal of Political Economy*, 108(1), 1-33.
- Allen, T. (2014). A survey of cyclical effects in credit risk measurement models. *Bank for International Settlements Working Papers No 126, January 2003*.
- Arzova, S.B., Sahin, B.S. (2023), Does financial development support renewable energy or carbon emissions A panel data analysis on emerging countries. *International Journal of Sustainable Economy*, 15(1), 93.
- Awonuga, A.R., Akande, F.I., Ogbebor, P.I. & Olarenwaju, G.O. (2021) Financial deepening and performance of listed money deposit banks in Nigeria. *Babcock journal of economics, banking and finance*, 8(1), 1-15.
- Barth J.R., Caprio G. Jr. Levine R., (2001). Financial regulation and performance: Cross-country evidence. *Central Bank of Chile Working Papers, No. 118*.

- Calem, P. S., & Rob, R. (1996). *The impact of capital-based regulation on bank risk-taking: A Dynamic Model*. University of Pennsylvania.
- Demirguc-Kunt, A. & Levine, R. (1996b), Stock Markets, Corporate Finance, and Economic Growth: An Overview. *The World Bank Economic Review*, 10: 2, 223 – 239.
- Diamond, D. and R. Rajan (2001). Liquidity risk, liquidity creation and financial fragility: a theory of banking. *Journal of Political Economy* 109, 2431-2465.
- Ehiedu, V.C., Onuorah, A.C. & Okoh, E. (2021). Automated teller machine (ATM) penetration and financial inclusiveness in Nigeria: A tripod banking system approach. *Indian Journal of Economics and Business*. 20(3), 1093-1104.
- Fitzgerald, V. (2016) Financial development and economic growth: A critical view, Worldeconomicandsocialsurvey, [online]availablehttp://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess_fitzgerald.
- Galeed, I. O., & Nwaoha, S. I. (2023). Financial deepening and commercial banks performance: evidence from Nigeria. *GPH-International Journal of Business Management*, 6(10), 115-129.
- Ghosh, S.,(2010). Credit Growth, Bank Soundness and Financial Fragility: Evidence from Indian Banking Sector. *Munich Personal RePEc Archive*. Paper No. 24715, Reserve Bank of India
- Igwebuike, E. C., Udeh, S. N. & Okonkwo, O. M.(2019). Effects of financial deepening on economic growth of Nigeria (1981-2016). *International Academy Journal of Business Administration Annals* 7(1), 54-67
- Ikpefan, O.A. (2013). Capital adequacy, management and firm value in the Nigerian commercial bank. *African Journal of Business Management*, 7(30), 2938-2950
- Jesuwunmi, C. A. D., Nzewi, U. C., Adewoyin, A. O. & Agbadua, O. B. (2019). Financial soundness indicators and nigeria deposit money banks' performance. *Canadian Contemporary Research Journal*, 2(1): 79-120.
- Kauffman, R.J., and Wang, B. (2001). New Buyers' Arrival Under Dynamic Pricing Market Microstructure: The Case of Group-Buying Discounts of the Internet. *Journal of Management Information*
- Klaas, J., & Vagizova, V. (2014). Tools for assessing and forecasting financial stability of the commercial bank under conditions of instability. *Investment Management and Financial Innovations* (4), 157-163
- Levine, R., & Zervos, S. (1998). Stock Markets, Banks, and Economic Growth. *American Economic Review*, 88, 537-558. <https://doi.org/10.1596/1813-9450-1690>
- Macharia, C., W. & Mungai, J. (2021). Financial Deepening and Financial Performance of Commercial Banks in Kenya. *Journal of Finance and Accounting*, 5(1), 39-48.

- Muhadzdzib, M. F., & Leon, F. M. (2022). The Influence of Financial Soundness on Financial Performance in the Banking Sector Listed on the IDX. *International Journal of Scientific Research and Management (IJSRM)*, 10(12), 4370–4378.
- Ndebbio, J.E.U. (2004) Financial Deepening, Economic Growth and Development: Evidence from Selected SSA Countries. *African Economic and Research Consortium*, RP142.
- Nwaolisa, E. & Cyril, U. (2019). Assessment of financial deepening on the growth of Nigerian economy: 1990-2016. *Journal of Contemporary Research in Business Economics and Finance*, 1(2), 16-29.
- Olalekan, A., & Adeyinka, S. (2013). Capital adequacy and banks' profitability: an empirical evidence from Nigeria. *American International Journal of Contemporary Research Vol. 3 No. 10; October 2013*
- Olawumi, S. , Lateef, L. and Oladeji, E. (2017) Financial Deepening and Bank Performance: A Case Study of Selected Commercial Banks in Nigeria. *Journal of Mathematical Finance*, 7, 519-535
- Onipe, A.Y., Zakaree, S.S., Farouk, B.K.U., Ojo, I.J., Musa, J.Y., & Isah, S.D. (2015) Financial system broadening and economic performance. *International journal of African and Asian studies*, 14 www.iiste.org
- Onyemachi, C. (2016). An empirical analysis of financial deepening and economic growth (1986-2010). Ahmadu Bello University, Economics, Zaria.
- Osinubi, T.S. (2004) Does Stock Market Promote Economic Growth in Nigeria? *The ICFAI Journal of Applied Finance*, 10, 17-35.
- Ozili, P.K. & Ndah, H. (2022) impact of financial development on bank profitability. MPRA paper no. 111337. Available at: <https://mpra.ub.uni-muenchen.de/111337/>
- Patrick, H.T. (1966). Financial development and economic growth in underdeveloped countries. *Econ. Dev. Cult. Chang*, 14, 174–189.
- Roman, A., & Şargu, A. C. (2013). Analysing the Financial Soundness of the Commercial Banks in Romania: An Approach Based on the Camels Framework. *Procedia Economics and Finance*, 6, 703-712
- Samule-Hope, D.C., Ehimare, O.A. and Osuma, G.O. (2020) The impact of financial deepening on economic growth in Nigeria. *WSEAS transaction on business economics* 7, DOI: 10.37394/23207.2020.17.96
- Sere-Ejembi, A., Ini S. U., Audu S., Ngozi, V. A., and Baba N. Y., (2014). Developing Banking System Stability Index for Nigeria. *CBN Journal of Applied Statistics*, 5 (1), 49-77.
- Shar, A. H., Shah, M. A., & Jamali, H. (2010). Performance evaluation of banking sector in Pakistan: An application of bankometer. *International Journal of Business and Management*, 5(9), 81-100.

- Toby, A.J. (2006). Essentials of corporate financial management. Department of banking and finance, Faculty of Management Sciences, Rivers State University of Science and Technology.
- Torbira, L. L. & Zaagha, A S. (2016). Capital Adequacy Measures and Bank Financial Performance in Nigeria: A Cointegration Analysis. *Journal of Finance and Economic Research*, 3(1), 15-20
- Udofia, & Okhae. (2024). CAMEL Indicators as Tools for Predicting Bank Financial Health Conditions in Nigeria. *International Journal of Business and Technopreneurship (IJBT)*, 14(2), 121–134.
- Werigbelegha, A.P. & Ogiriki, T. (2018). A causality investigation of financial deepening and the growth of the Nigerian Economy (1990-2017). *International Journal of Economics, Commerce and Management*, 6(6). 423-432.
- Yartey, C.A. (2008) Well-Developed Financial Intermediary Sector Promotes Stock Market Development. *Evidence from Africa. Journal of Emerging Markets Finance*, 6, 269-289.
- Yousuo, P. J. O., & Ekiou, B. H. (2020). Financial deepening and economic growth in Nigeria 1981 to 2018. *Journal of Social and Administrative Science*, 4(2), 79–91
- Yusuff, M.A & Olaniran-Akinyele, O.F (2019) *Financial Deepening And Financial Performance Of Deposit Money Banks In Nigeria*. *Advances in Social Sciences Research Journal*, 6 (11), 179-191.