



Bank-Specific Characteristics and Capital Structure of Listed Deposit Money Banks in Nigeria

Adedeji, L. O. and Jooda, T. D.

Department of Banking and Finance, Faculty of Financial Studies,
Osun State Polytechnic, Iree, Nigeria.
Correspondent e-mail address

Date of Submission: 08-05-2024

Date of Acceptance: 20-05-2024

ABSTRACT

Bank capital structure decisions are contentious, attracting regulators, investors, and academics due to potential insolvency risks and the mandate to maintain higher capital levels. This study investigates the influence of bank-specific characteristics on capital structure decisions of 13 Nigerian listed Deposit money banks from 2006-2023. The study estimates a dynamic panel data model with the aids of E-views 12.0 software package, using descriptive and inferential statistics through the Generalised Methods of Moment (GMM) dynamic panel estimator's framework and the Granger non-causality model developed by Toda Yamamoto (1995) to analyse the causal relationship between bank-specific characteristics and capital structure variables. The results showed that banks' capital structure behaviour conformed to the principles of the pecking order theory by utilizing internal sources of funding before resorting to external debt financing. This is evidenced as capital structure measured by book leverage was statistically significant and negatively affected by return on assets and credit risk. On the other hand, liquidity and deposit significantly and positively drive capital structure of listed deposit money banks in Nigeria. The study therefore recommended that banks should intensify more efforts on deposits mobilization drive as a source of short-term funds to finance their businesses and that regulators should encourage banks to maintain optimal levels of profitability and liquidity to effectively minimize risks and enhance financial stability that will ultimately benefit the broader economy.

Keywords: Bank specific-characteristics, capital structure, profitability, liquidity, credit risk, deposits

I. INTRODUCTION

Background to the Study

The potential of banks to significantly influence a nation's capacity for economic growth and prosperity depends on their ability to mobilise and allocate resources to various economic sectors. These intermediary roles allow banks to finance their operations with a high degree of debt and a low level of equity. Nevertheless, the capital structure decision of the banks determines their overall sound financial status and structure, strong financing capabilities, and ability to grow over time (Sibindi, 2018). In addition to statutory minimum capital requirements and other factors, capital structure decisions made by banks impact their financial well-being (Sorokina, Thornton & Patel, 2017). The combination of debt and equity capital used to finance a company's assets is known as its capital structure. On the other hand, an ideal capital structure is a combination of debt and equity capital that maximises profitability, minimises costs, and maximises value for banks' survival and growth (Oke & Balade, 2015; Adesugba & Olare, 2022).

Furthermore, banks are special industries and differ from other financial and non-financial firms. This is because they are highly levered and regulated apparently due to the nature of its assets and liabilities (Tengku, Nazrol, Razali & Zulkufly, 2020); Aremu, Ekpo, Mustapha & Oyin, 2013). According to AL-Mutairu and Naser (2015), banks have short-term, demand-payable liabilities with fixed costs and little operating leverage. They are also concerned with solvency and liquidity. Because of these differences, dynamic business fluctuations, and institutional regulations in the banking sector, financial managers have numerous obstacles when deciding on the best funding option for banks (Tengku et al., 2020). One of the main factors contributing to bank hardship and failure has been the issue of making the incorrect choice and choosing the wrong target capital structure



(AL-Mutairu & Nasir, 2015). In addition, bank capital serves as key determinant of bank risk and performance as well as a protection against systemic collapse during financial crises (AL-Mutairu&Nasir, 2015).Ever since Modigliani and Miller's (1958) assertion, the determination of bank capital structure has remained a debatable and unsettled topic within the realm of corporate finance.

Consequently, the question of whether the right mix of debt and equity increases the firm's worth has been brought up, and the question of what variables drive the ideal capital structure of the business has been discussed frequently ever since. Many scholars, including Swai (2019), Mohammad (2022), Aktas, Acikalin, Bakin, and Celik (2015), have found a number of firm-specific variables that, though in various ways, influence capital structure. These firm-specific features are internal elements under management control, such as asset tangibility, profitability, financial risks, liquidity, and deposit levels, and have been shown to influence bank funding decisions. Nevertheless, the magnitude of the impacts and the trends of the connections among these factors differ because of variations in the measurement of key variables, methodological approaches, as well as cultural, institutional, and national contexts. Moreover, prior research in the finance domain, including studies by Gropp and Heider (2010), Aremu et al. (2015), Sibindi (2018), Adesugba and Olalere (2022), and Mohammad (2022), has illustrated that conventional non-financial firm-specific factors, which serve as determinants of capital structure, exert an impact on the banking sector. Additionally, an important distinguishing factor for banks is the regulatory oversight of their capital, which can significantly shape their decisions regarding capital structure (Sorokina et al., 2017). These inherent features of banking operations and regulatory requirements set banks apart from other non-financial entities. Consequently, the financing choices made by banks hold considerable significance, as evidence suggests that capital structure affects bank stability, resilience, as well as their ability to provide liquidity and extend credit effectively (Diamond & Rajan, 2000).

Statement of the Problem

The considerable high level of leverage observed in banks can be attributed to their core activities such as deposit mobilization, liquidity provision, and loan issuance (Allen, 2014). However, relying solely on customers' deposits to

finance loans poses challenges due to the collective action problem faced by depositors, often resulting in bank runs. Despite the significant risks associated with leverage, why do banks still opt for high levels of leverage? Although limited studies are available, particularly in developing countries like Nigeria, there are several notable investigations by scholars such as Flannery and Rangan (2008), Octavia and Brown (2008), Gropp and Heider (2010), Sibindi (2018), and Sorokina et al. (2017). These studies delve into the impact of various banks' internal factors affecting the financing decisions of banks, drawing on relevant capital structure theories and data primarily from developed countries like the United States and European Union. In addition, these studies have revealed that bank-specific factors, traditionally considered as normal factors affecting capital structure of non-financial firms, also significantly influence capital structure decisions in developed countries. Moreover, core characteristics specific to banks, such as liquidity, credit risk, deposit levels, and regulatory capital arbitrage potential, all contribute to shaping bank capital structures (Arimu et al., 2013). However, the critical question arises as to whether these findings from industrialized nations can be generalized to banks operating in emerging economies, particularly Nigeria.

Furthermore, numerous scholars have proposed and endorsed various theories over the years to elucidate the factors influencing optimal capital structure decisions amid market imperfections. The variables used to characterize capital structure decisions, both for non-financial firms and banks, are derived from these theories. Yet, there remains no empirical consensus regarding which theory holds primary significance and which does not. Additionally, there is insufficient compelling evidence to suggest that the choices of financing instruments made by Nigerian deposit money banks offer empirical backing for the prevailing theories of capital structure relevance.

The academic community remains divided on the mechanisms driving optimal capital structure for banks, primarily due to the unique financial characteristics of banks and the limited empirical research conducted in the banking sectors of developing countries, notably Nigeria, which has resulted in mixed and inconclusive findings. This study stands out by contributing to the body of knowledge on bank capital structure literature. Unlike previous studies that mainly focused on non-financial firms in Nigeria, this research



examines the impact of bank-specific characteristics such as deposit structure, credit risk, liquidity ratio, and profitability, which were often overlooked in prior studies on the capital structure determinants in Nigerian banks.

Moreover, the current study adds to the existing literature in developing economies by expanding upon Gropp and Heider's (2010) research on capital structure determinants. It introduces different independent variables such as credit risk, deposit-to-liabilities ratio, loans-to-deposits ratio, and return on assets to gauge banks' risk, deposit levels, liquidity ratios, and profitability in determining the financing mix of DMBs in Nigeria. Additionally, the study investigates the applicability of the trade-off theory and pecking order theory, along with employing unique methodologies such as the Granger causality test to ascertain the causal relationship between bank-specific characteristics and capital structure in Nigerian banks. Furthermore, it utilizes dynamic general method of moment (GMM) estimators to analyze the dynamic association between the bank-specific factors and target capital structure. In light of this context, the study aims to address the following questions:

- i. What are the potential bank-specific characteristics that determine the optimal capital structure of deposit money banks in Nigeria?
- ii. Do any of the bank-specific factors Granger-cause the capital structure of deposit money banks in Nigeria?
- iii. To what extent do the trade-off and pecking order theories explain the capital structure of Nigerian banks?

Furthermore, the study seeks to test the following hypotheses:

- i. There is no significant influence of bank-specific characteristics on the capital structure of deposit money banks in Nigeria.
- ii. Bank-specific characteristics have no causal relationship with the capital structure variables of deposit money banks in Nigeria.
- iii. Capital structure decisions for Nigerian deposit money banks do not align with the static trade-off and pecking order theory.

The paper is organized as follows: the first section dealt with background of the paper while the second section discusses literature review particularly, the general conceptual, theoretical as well as empirical reviews of bank-specific characteristics and the capital structure of banks. Section three includes the study's mathematical

model, variables measurement, data gathering sources, and methods. Discussions and a result analysis are included in the fourth section and finally, conclusion, recommendations and suggestions for additional research are made section five.

II. REVIEW OF RELATED LITERATURE

2.1 Capital Structure

According to Allen et al. (2015), capital structure describes how a company finances its assets using a variety of long-term funding sources that are shown on its balance sheet. It also clarifies the relationship between stock and debt inside the company. These long-term funding avenues encompass debt instruments such as mortgage bonds, debentures, preferred stocks, business debts, tax debt, and other liabilities, along with equity capital like common stock or ordinary share capital, reserves, and retained earnings (Aremu et al., 2015; Eniola, Adewunmi & Akinselure, 2017). Ghasemi and AbRazak (2016), as well as Ahmeti, Kalimashi, Ahmeti, and Ahmeti (2023) proposes a number of metrics, including ratios like equity to debt, equity to total assets, total debt to total assets, long-term debt to total assets, and short-term debt to total assets, that can be used to measure capital structure.

Banks fulfil their funding requisites by either raising equity capital or resorting to borrowing. In other words, banks' capital structure comprises a blend of stocks, subordinated debt, and deposits from depositors and other creditors. Nonetheless, banks encounter constraints when selecting from a gamut of financing alternatives, including regulatory constraints, the costs associated with each financing avenue, and information asymmetry. Consequently, when delineating the optimal capital structure for banks, the primary objective is to maximize the value of owners' investments in the banks. For the purpose of this study, debt ratio or leverage ratio is used as a proxy for banks' capital structure.

Leverage

Leverage denotes the proportion of debt or borrowed funds utilized by a company to finance its operations (Aljamaan, 2018). Financial leverage represents a funding strategy wherein borrowing is employed to procure more capital than what could be attained through stock offerings (Abbas, Iqbal, & Aziz, 2019). In essence, it is a component of a company's balance sheet and includes the combination of equity (common stock, preferred



stock, and retained earnings) and debt (long-term loans) that a business uses to guarantee its assets (Al-Harby, 2019). According to Aremu et al. (2013), leverage is one example of a proxy for capital structure that can be evaluated in terms of book value or market value.

Building on the research by Gropp and Heider (2010), this analysis defines leverage in book value terms as (1 minus equity divided by total assets), or the liability-to-total-asset ratio. This implies that an increase in debt-to-equity ratio will lead to higher financial leverage (Kythreotis, Nouri, & Soltani, 2018). Leverage book value is chosen because it closely reflects the cost of a firm's financial distress, provides conventional way of measuring the capital structure of firms, and as a result of limited available market value data. Kumar (2017) delineates banks' total debt capital to include debentures, bonds, interbank loans, short-term loans, public and interbank deposits, and various other liabilities. However, for banks, deposits constitute a significant portion of their debts, and this source of finance tends to be more short-term in nature (Nguyen & Kayani, 2013).

Bank-specific Characteristics

Bank-specific features refer to internal elements that are predominantly influenced by the decisions of bank management and policy objectives when making financing decisions for the company (Eniola et al., 2017). This study will examine bank-specific aspects such as profitability, liquidity, credit risk, and deposit structure and explore how these factors interplay with capital structure theories.

Bank's Profitability

The term "bank profitability" describes the effectiveness with which a bank uses its assets to produce profits, taking into account both its overall revenue and expenses. It serves as a financial metric to evaluate managerial efficiency and overall performance (Adesugba and Olalere, 2022). The profitability of a bank is influenced by factors such as earning performance, revenue sources, and the sustainability of earnings. Profitability basically shows how well a business uses all of its resources to produce revenue while also holding onto some for later use (Iskandar and Arshad, 2019). Profitability is evaluated using various metrics, with return on assets (ROA) and return on equity (ROE) ratios being the most commonly used ones by managers and investors. For this study, the bank's profitability is measured by return on assets (ROA). ROA is preferred because it effectively

evaluates firm performance by comparing income statement performance to the assets required for firm operations.

Bank's liquidity

Liquidity pertains to both the asset and liability sides of a company's balance sheet. It denotes the cash and other assets readily available to banks for promptly settling bills and meeting short-term commercial and financial obligations (Al-Harby, 2019). In essence, liquidity reflects a bank's ability to convert liquid assets into cash swiftly without incurring additional costs or affecting asset prices (Ghasemi & AbRazak, 2016). The ability of a bank to satisfy its known and unknown cash, financial, and operating requirements profitably and without suffering losses is what defines its liquidity (Ayunku, 2017).

This study examines bank liquidity akin to the methodologies employed by Aragaw (2015) and Ayunku (2017), which involves dividing total bank loans and advances by total deposit liabilities. This ratio assesses the proportion of depositors' funds (deposit liabilities) that banks utilize to extend loans within a specific timeframe (Ahmeti et al., 2023).

Bank Risk

In the world of finance, risk is defined as the likelihood of suffering a loss that could lower profits. Bank risk pertains to the level of risk inherent in a company's business operations (Marandu & Sibindi, 2016). Aremu et al. (2013) define bank risk as the proportion of loans extended by banks to households and other business entities relative to the bank's total assets.

Given that bank loans are relatively illiquid and carry a higher default risk compared to other bank assets, the ratio of bank credits to total assets is commonly used to measure bank credit risk. There are other methods of assessing banks' business risks, and Sibindi (2018) evaluates banks' business risk using credit risk, which is defined as loan loss provision divided by total loans. In this study, credit risk is used to quantify banks' risk because banking operations involve the origination of loans and advances, which are considered the riskiest assets due to their uncertain nature and the potential accumulation of outstanding loans. Thus, bank credit risk is measured by dividing the total loans and advances by total bank assets (Aremu et al., 2013; Sorokina, 2017).



Bank Deposit Structure

According to Nahm and Vu (2013), bank deposits refer to the total amount of money kept in customers' current accounts, savings accounts, demand deposits, and time deposits. These deposit liabilities are the main source of short-term capital that banks rely on to support their profit-making operations (Ramlan and Adnan, 2016). The main reason for this is that banks customers have the ability to withdraw their money whenever they want from the banks. This study incorporates deposit structure because it serves as a key indicator of a bank's capacity to generate liquidity and according to Al-Harby (2019), liquidity is found to be significantly and positively related to

the bank's external funding. According to Allen (2014), the theory of bank capital structure demonstrates that deposits often represent an optimal source of capital to banks, effectively rendering deposits similar to short-term debt. Deposit structure is typically expressed as a deposit-to-total assets ratio, which assesses the proportion of assets funded by public deposits while simultaneously evaluating whether banks with higher deposit inflows incur higher operational costs to attract deposits. Notably, a smaller deposit-to-total assets ratio indicates a greater ability for the bank to finance its asset base through deposits.

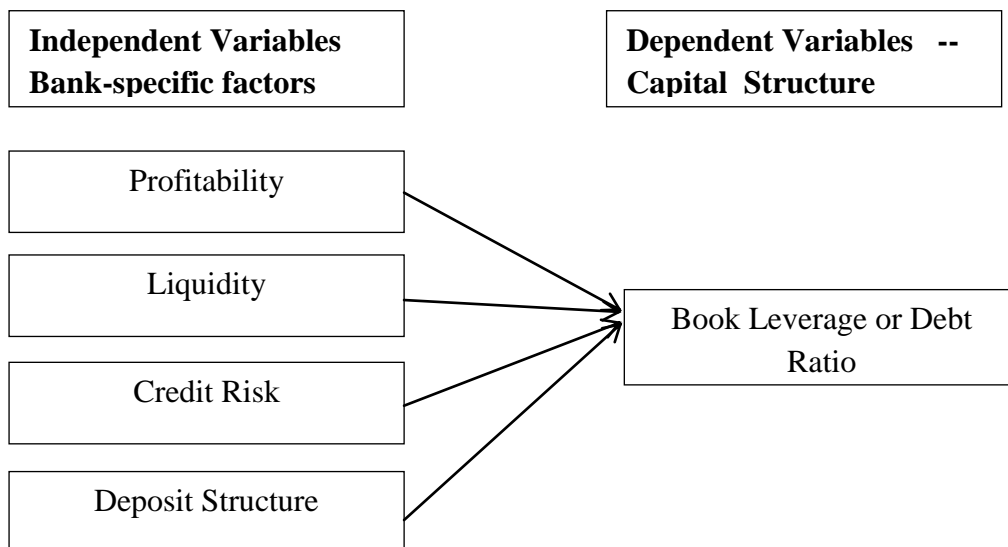


Figure 2.1: Conceptual Model of the link between Bank-specific factors and Capital Structure

2.2 Theoretical Review

Following the irrelevance assertions of Modigliani and Miller (1958), numerous hypotheses have been developed to explain company funding decisions. Nevertheless, the pecking order and trade-off theories have been applied to existing research on the factors influencing capital structure in both developed and developing nations when interpreting their findings. In order to explain the capital structure options for financial institutions, such as Nigerian deposit money banks, this work thus draws inspiration from previous research and bases its analysis on the trade-off and pecking order theories.

Trade-off Theory

The static trade-off concept was first proposed by Modigliani and Miller in 1958. It centres on tax-shelter benefits, bankruptcy costs,

and agency costs. This hypothesis states that corporations can only use debt financing in their capital structures if there is no offsetting cost of debt. Afterwards, Kraus and Litzenberger (1973) presented the theory of the optimal capital structure, which equalises the advantages and disadvantages of debt financing. In this trade-off model, interest payments provide a tax shelter, whereas equity income is subject to corporation taxation. As a result, debt financing is significantly more advantageous than equity financing. However, using debt also comes with financial risks, therefore debt financing is not always less expensive than equity financing. Myers (1984) extended this theory within the context of the static trade-off by suggesting that businesses set a target debt-to-value ratio and progressively strive to accomplish it, similar to how businesses modify dividends to reach a goal dividend payout ratio.



Managers must consider the advantages and disadvantages of borrowing while working to keep their debt levels at an ideal level in order to optimise business value, according to the static trade-off hypothesis.

The trade-off framework operates under the assumption that a company has only debt and equity financing options. Consequently, the company will increase its debt levels to capitalize on the tax shield provided by debt interest until the costs of bankruptcy balance the present value of the interest tax buffer. At this juncture, it becomes prudent for the firm to seek financing through equity (Oke & Obalade, 2015).

Pecking Order Theory

The pecking order theory was developed by Myers (1984) and Majluf (1984). It is often referred to as cost theory or information asymmetry. When management (insiders) has access to more knowledge than investors (outsiders), they might take advantage of this information asymmetry. The idea holds that when a company needs outside funding through the bond market, it should issue safe securities instead of risky ones, but if at all feasible, it should raise equity through retention. This implies that the companies' first choice for obtaining outside funding is to issue debt, which is followed by less popular options such hybrid securities like subordinated debt, and equity in the last place. According to Aremu et al. (2013), firms have a spectrum of financing options available, including internal cash, debt, and external stock sources. For instance, in project financing, managers typically prefer to utilize retained earnings to fund projects initially. Once retained earnings are depleted, they may resort to issuing debt, and finally, equity may be considered when issuing more debt is deemed imprudent (Sibindi, 2018).

The pecking order hypothesis posits that issuing risky securities entails adverse selection costs stemming from asymmetric information, managerial optimism, or both. Firms tend to favor internal funding sources over external ones to

mitigate adverse selection costs. If external funding is necessary, debt financing is generally preferred over equity financing (Al-Harby, 2019). Myers (1984) explains that a pecking order framework lacks a well-defined target debt-to-equity ratio objective. Instead, the focus is on choosing the path of least resistance and the lowest-cost financing option (typically debt), with little consideration for the future implications of these decisions (Aremu et al., 2013).

Theoretical Framework and Hypotheses Development

To achieve the study's objective, hypotheses can be formulated regarding the relationship between book leverage, and various observed bank-specific characteristics such as profitability, liquidity, credit risk, and deposit structure using trade off and pecking order theories. The trade-off theory, according to Myers (1984), states that businesses aim for debt levels that strike a compromise between the tax advantages of having more debt and the costs of possible financial difficulties. This idea predicts that enterprises that pay taxes will borrow money in moderation. The Pecking Order hypothesis, however, states that a company will borrow money rather than issue shares if internal cash flow is insufficient to pay for capital expenditures. Pecking order theory does not have an ideal debt ratio, in contrast to trade-off theory.

Deposit taking is one of the core activities of banks and considered as inputs because they serve as extra source finance to banks at lower interest rates compared to borrowed funds (Ayunku (2017). Banks used deposits to finance their operations and make profits from loans created (Ramlan and Adnan, 2016). According to Iskandar & Arshad (2019), deposits are bank liabilities because they are repayable to the depositors at any point in time. Bank with higher deposit level are found to be highly levered hence, bank deposit level may influence capital structure either positively or negatively.

Table 2.1: Theoretical Framework

Determinants	Expected Sign	Trade-off Theory	Pecking order Theory
Profitability	Negative (-)	Positive (+)	Negative (-)
Liquidity	Negative (-)	Positive (+)	Negative (-)
Credit Risk	Negative (-)	Negative (-)	/
Deposit Structure	Negative (-)	Positive (+)	Negative (-)

Source: Myers and Majluf (1984)



2.3 Empirical Review

By examining data from US banks, Octavia and Brown's (2008) study delves into the factors that influence bank capital structure. Their study revealed that the same characteristics that are widely recognised as standard determinants of capital structure for non-financial firms, such as profitability, liquidity, asset tangibility, size, and growth, also have a major impact on the capital structure decisions made by banks in developed countries. This implies that banks take these considerations into account when deciding on the best capital structure, just like non-financial companies do. The results emphasise the relevance of these bank-specific features in influencing capital structure decisions in several economic sectors, including the banking sector.

Empirical research conducted by Iwarede and Akinyele (2010) to determine the basic factors that influence capital structure in the banking industry was predicated on a survey of twenty-five institutions. The results showed that a number of important variables such as profitability, tangibility of assets, issuance costs, tax benefits related to debt financing, risk or expenses of financial trouble, and earnings per share have a significant impact on the capital structure choices made by banks.

Similarly, the variables impacting the decisions made by the banking industry about capital structure are somewhat uniform across various geographical areas and banking systems. This was shown in Gropp and Heider (2010) where a sample of European banks was used to investigate the determinants impacting bank capital structure. The study examined various parameters, including asset tangibility, market-to-book ratio, bank size, profitability, and dividend payouts. Their study showed that these factors, which are frequently thought of as capital structure determinants in non-financial firms, also had a significant influence on banks' capital structure choices.

In order to understand financing activities within financial services organisations, Moyo (2016) examined the theories of market timing, pecking order, and dynamic trade-off. The study sought to determine which relevant theories best explained the financing behaviour of various financial organisations by using a varied panel of South African banks and insurance businesses. The study's results showed that bank funding decisions defied the predictions of the pecking order and market timing theories while agreeing with the dynamic trade-off concept. Sorokina, Thornton, and Patel (2017) examined the

financing behaviour of 1700 publicly traded US banks from 1973 to 2012 in order to build on the work done by Gropp and Heider (2010). Their research showed that in addition to regulatory requirements, general market features such as size, profitability, market-to-book ratio, collateral, dividends, risk, and other macro- and microeconomic factors also have an impact on banks' capital structures. These findings provide insight into the complex web of variables affecting US banks' financing decisions. Using a sample of sixteen South African banks between 2006 and 2015, Sibindi (2018) conducted research on the factors influencing bank capital structure. To find the relationship between bank leverage and the firm-level factors that determine capital structure, the study used panel data methodologies and a fixed effects model. According to the study's findings, banks and non-financial organisations behave similarly when it comes to financing. Leverage was shown to be adversely correlated with variables connected to the global financial crisis and profitability, but positively correlated with growth potential, credit risk, and size. Because of this, banks' funding practices follow the pecking order idea.

Aremu, Ekpo, Mustapha, and Oyin (2013) conducted an investigation into the factors influencing capital structure choices within the Nigerian banking industry spanning the years 2006 to 2010. Employing the pooled ordinary least squares (Pooled OLS) technique and an econometric approach grounded in capital structure models and theories, the study explored the relationship between leverage ratio levels and several factors including liquidity, profitability, growth, tangibility, size, dividend payout, and tax charge over the study period. The analysis revealed that all determinant factors exhibited sign assumptions consistent with theoretical expectations. Notably, profitability, risk, tangibility, and tax exhibited a substantial and negative relationship with leverage, whereas liquidity, expansion, size, and dividend payout were significantly and positively associated with bank leverage in Nigeria.

The determinants impacting capital structure in a sample of 47 commercial banks listed on Gulf Cooperation Council (GCC) stock markets were examined by AL-Mutairi and Naser (2015). The study, which examined data from GCC commercial banks from 2001 to 2010, discovered that decisions on bank capital structure were influenced by factors such as profitability and liquidity. Also, Oke and Obalade (2015) investigated factors affecting capital structure of six



out of the ten listed Nigerian oil corporations spanning the years 2005 to 2012, in order to test the assertions of the optimal capital structure theory. Utilizing Pooled OLS, Fixed, and Random Effect Models for analysis, along with reliability tests such as the T-test, F-test, and Durbin Watson test, the study revealed that there exist a significant and positive relationship between profitability and the capital structures of Nigerian oil corporations. The results conformed to the static Trade-off theory, which suggests that highly profitable firms tend to employ more debt due to lower bankruptcy risk and significant tax benefits.

Using data from 412 French financial organisations between 2002 and 2012, Jouida (2018) examined the connection between capital structure and financial performance. An investigation into the reverse causal relationship between capital structure and financial performance was conducted using a PVAR model. Once individual fixed variables are taken into account, the results indicate a two-way causal relationship between capital structure and financial performance.

Ghosh and Chatterjee (2018) analyzed the variables affecting capital structure of banks from the point of view of corporate finance. The study made use of data collected from banks listed on Indian stock exchange for an extended period and juxtapose the findings with a comparable sample of largest non-financial firms. The outcome of the analysis revealed that profitability, growth opportunities and risk are the major factors influencing bank capital.

Using a fixed-effects regression model, Sakunasingha, Anekwasinchai, and Wiriyawit (2018) examined the factors influencing the bank capital structure of Thai local banks from 2004 to 2014. It looked at the relationship between firm-level factors such bank profitability, risk, growth, and liquid assets and bank leverage, which was determined by utilising the risk-weighted book value leverage ratio and book value leverage ratio. The findings demonstrated a statistically significant correlation between the book value leverage ratio and firm-level factors.

The capital structure decisions made by conventional and Islamic banks in the Middle East and North Africa (MENA) were compared by Al-Harby (2019). The impact of profitability, tangibility, business risk, and age on the capital structure of both conventional and Islamic banks was investigated over a 20-year period using cross-country data, regression analysis, and descriptive statistics. As a result of the analysis, the capital structure of both banks was significantly positively

correlated with size, liquidity, and inflation; nevertheless, there was a strong negative link with profitability, tangibility, business risk, and age.

Swai (2019) investigated the effects of bank capital structure, as determined by the leverage ratio, on the portfolio behaviour of commercial banks in Tanzania. The leverage ratio was defined by Basel III and was based on the ratio of tier 1 capital to total assets. Twenty Tanzanian commercial banks' yearly financial statement data from 2002 to 2017 were used in the study using a fixed balance panel. The findings showed that just 35% of banks were undercapitalized and that the examined factors were found to be significant and positive correlation exist between the bank's size and leverage structure.

Mohammad (2022) studied the factors unique to banks that affected the shift in capital structure during the Covid-19 epidemic in Pakistan between 2016 and 2020. The research examined the effects of bank-specific factors like profitability, size, and competition on the capital structure of all commercial banks in Pakistan using fixed effect estimation and the difference general method of moments (GMM). The analysis, which was based on imbalanced quarterly data from 2016q1 to 2020q3, showed that macroeconomic shocks had a greater impact than bank-specific factors on banks' decisions on capital structure throughout the Covid-19 era. Adesugba and Olalere (2022) examined the variables influencing the capital structure of Nigerian deposit money banks from 2011 to 2020. The study found that the leverage of the sampled deposit money banks in Nigeria was positively impacted by business size and profitability using panel data regression analysis on data from the annual reports and accounts of the sampled banks in Nigeria. Ahmeti, Kalimashi, Ahmeti, and Ahmeti (2023) examined the capital structure of 47 commercial banks from Western Balkan nations between 2015 and 2020. The study used Ordinary Least Square, Fixed Effect, and Random Effect regression models along with descriptive and multiple linear regressions to examine the relationship between bank book leverage and bank-specific explanatory variables like profitability, leverage ratio, bank size, earnings volatility, collateral, growth opportunities, and liquidity. Findings showed that liquidity had a considerable negative impact on the book leverage of Western Balkan commercial banks during the given period, the data showed a strong positive association between profitability and book leverage.



III. METHODOLOGY

Research Design

The study employed Ex-post facto research design. This is because the study adopted quantitative approach and secondary data on what actually transpired in nature were collected. Another reason for the adoption of this type of research design is because it exposes the factors that are related to some underlying occurrences, conditions and financing behavior of banks by investigating historical data to ascertain the likelihood of some factors that are responsible without any form of bias on the part of the researcher.

Population and Sample Size of the Study

All the twenty-two (22) Deposit Money Banks in Nigeria as at December 31, 2022 were included in the study's population. Thirteen (13) listed banks out of the fourteen (14) banks listed on the Nigerian Stock Exchange as of December 31, 2022, were taken as the sample size for the study using a purposive, non-probability sampling technique. Also, non-interest banking was not included in the sample banks, while the sample size represented roughly 59% of the total population. The sampled banks comprises only listed Deposit Money Banks that had been listed on the Nigerian Stock Exchange from their incorporation on or before January 1, 2006, and still in existence as of December 31, 2022 were included in the sample. These sampled listed DMBs are; Access bank, Ecobank, First Bank Nigeria Holdings, First City Monument Bank, Fidelity bank, Guaranty Trust Bank, Stanbic IBTC bank, Sterling bank, United Bank for Africa, Wema bank, Union Bank of Nigeria and Zenith bank.

Data Collection

The study used annual panel data estimation and secondary data. The data were gathered from the Nigeria Stock Exchange, the websites of the 13 sampled listed Deposit Money Banks, their published annual reports and financial statements, the Central Bank of Nigeria's (CBN) Annual Accounts, the National Bureau of Statistics (NBS), and Statistical Bulletins for the period between 2006 and 2022.

Description of variables

The main objective of this study is to examine the impact of bank-specific characteristics

on the capital structure of DMBs in Nigeria. Therefore, factors specific to banks were used as proxies for capital structure determinants. The dependent variable is book leverage, calculated as 1 minus equity divided by total assets, was used to represent the bank capital structure. Bank returns on assets, the ratio of deposits to loans, loans to total assets, and deposits to total assets are the independent variables that were utilized in the study as proxies for profitability, liquidity, credit risk, and deposit structure respectively.

Method of Data Analysis

The study employed both descriptive and inferential statistics to estimate a dynamic panel data model with the aids of E-views 12.0 software package for the years 2006 to 2022. Following the research in Al-Harby (2019), the impact of bank-specific factors on capital structure and the direction of the causal relationship between the bank-specific characteristics and capital structure variables were analysed, using the Generalised Methods of Moment (GMM) dynamic panel estimator's framework and the Granger non-causality model developed by Toda Yamamoto (1995). The reason for the employment of the GMM approach (orthogonal deviations) by Arellano and Bover (1995) was as a result of the dynamic nature of bank capital structure. The problem of fixed individual effects is addressed by combine's regressions of levels and first differences, which makes GMM estimation more efficient than difference GMM even in the presence of endogeneity, serial correlation, and heteroscedasticity among individuals. In order to verify that the data used were not given erroneous estimates and to ascertain the variables' order of integration, a unit root test was also performed.

Model Specification

In order to realize the objectives of the study, two (2) models were adapted. The first model was developed by Somaini and Wolak (2016) and is estimated to examine the effect of firm-specific characteristics like profitability, business risk, liquidity and deposit ratio on capital structure of DMBs in Nigeria while the second model is to test the causal relationships that exist between bank-specific characteristics and capital structure banks as in hypotheses 1 and 2 respectively. The functional relation mathematical model is given as:

$$BLEV = f(\text{PROF, LIQ, LS, BDR}) \dots\dots\dots(1)$$

The econometric model adapted is stated as:

$$Y_{it} = X_{it}\beta + e_i + \eta_t + U_{it} \quad (t \in \{1, \dots, T\}; i \in \{1, \dots, N\}) \dots\dots\dots(2)$$



Where: Y_{it} represent the dependent variable where i = entity and t = time; X_{it} is a $K \times 1$ vector of included variables; t is a time fixed effect; e_i is a group/entity fixed effect; U_{it} is the error term. This model can be specified and transformed to econometric models as:

Model 1: $BLEV_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 LIQ_{it} + \beta_3 LS_{it} + \beta_4 BDR_{it} + U_{it} \dots \dots \dots (2)$

Model 2:

$BLEV_t = \beta\alpha_0 + \sum_{i=1}^{k+dmax} \beta_{1i} BLEV_{t-1} + \sum_{i=1}^{k+dmax} \beta_{2i} PROF_{t-1} + \sum_{i=1}^{k+dmax} \beta_{2i} LIQ_{t-1} + \sum_{i=1}^{k+dmax} \beta_{3i} LS_{t-1} + BDR_{t-1} U_{it} \dots \dots \dots (3)$

Mathematically, a priori expectation can be written as: $\beta_1 < 0, \beta_2 > 0, \beta_3 < 0, \beta_4 > 0$

Where:

BLEV denotes book leverage proxies for capital structure and dependent variables, while bank-specific characteristics denote independent variables as profitability (PROF), liquidity (LIQ), loans structure (LS) and bank deposit ratio (BDR). Also, U_{it} denotes t error terms, β_0 denotes intercept (constant variable), $\beta_1 \dots \beta_4$ denotes coefficient of variables whereas i and t denote bank and time specific effects.

Hypothesis Testing and Decision Rule

All the Null hypotheses were tested with relevant statistical techniques and the decision rule is to reject the null hypothesis if the test statistic value is absolutely greater than the corresponding critical values at 0.05 (5%) levels of significance.

IV. EMPIRICAL RESULTS

4.1 Descriptive Analysis

Table 4.1: Descriptive Statistics

VARIABLES	OBS	MEAN	Std. Dev.	MIN	MAX
BLEV	169	0.8637	0.1699	0.6370	2.5470
PROF	169	0.0241	0.0445	-0.0910	0.4480
LIQ	169	0.6301	0.2953	0.1420	3.2290
RSK	169	0.3953	0.1093	0.1260	0.6140
BDR	169	0.6628	0.1478	0.0770	1.6120

Source: Author’s Computation using E-views 12.0 (2022).

The descriptive statistics of the variables are presented in Table 4.1 showing the central measures of tendency mean, standard deviation and minimum and maximum values, and total number of observations for the DMBs in Nigeria for a period between 2001 and 2022. During the entire period, the mean of the Nigerian sampled banks’ book leverage is 86.4% (0.864) of the total assets. This shows that DMBs are highly leveraged and operate at higher financial risk with minimum debts of 0.637 and a maximum of 2.547, respectively. Furthermore, the result revealed that the mean of deposit structure for the banks is 66.3% (0.6628) with standard deviation of 0.1478, maximum and minimum values of 1.6120 and 0.0770 respectively. This also implies that higher financing source comes from public deposits mobilized and collected at a cheaper rate compared to borrowed funds.

Furthermore, the mean of profitability measured by return on assets, is 2.41% (0.0241). Also, the minimum and maximum values of this

mean value are -0.10 and 0.45, respectively and this mean value deviated by 4.45%. It also implies that a 1 naira investment in bank assets generated a profit after tax of only 2.41%. This return is lower when compared to the findings in Gropp & Heider (2010) on the US and other European banks. Throughout the study period, the loans to deposits ratio yielded a mean liquidity score of 0.63; the standard deviation, minimum, and highest values were 0.2953, 0.1420, and 3.2290, respectively. This suggests that a portion of some banks' deposits were used to fund loans, indicating that these banks may not be liquid.

The findings also revealed that, for the sampled banks, the minimum and maximum values of risk asset, expressed as credit to total assets, are 0.126 and 0.614, respectively, while the average and standard deviation are 0.3953 and 0.0109. The findings showed that, with an average mean of 39.5%, some banks had loaned out up to 61.4% of their entire assets.



Unit Root Test

Table 4.2: Summary of Panel Unit root Test Results

Variables	Levin, Lin & Chu t	Hadri Z – stat	Level	Remarks
BLEV	-2.5948 (0.0047)	5.1839 (0.0000)	I(0)	No Unit Root
PROF	-3.8227 (0.0001)	3.2930 (0.0462)	I(0)	No Unit Root
LIQ	-2.1536 (0.0156)	1.6830 (0.0462)	I(0)	No Unit Root
RSK	-5.5328 (0.0000)	3.2306 (0.0006)	I(0)	No Unit Root
BDR	-5.5328 (0.0000)	3.2306 (0.0006)	I(0)	No Unit Root

Source: Author’s Computation (2022).

The panel unit root test methods of Hadri Z-stat and Levin, Lin & Chu t* were utilised in the study to investigate the presence of unit roots in the variables. According to the test's decision rule, the alternative hypothesis argues that there is no unit root, whereas the null hypothesis says that there is.

At zero level order of integration (I(0)) and with p-values of less than 0.05 level of significance, all variables are stochastic processes, according to Table 4.3's panel unit root test results. This shows that the panel used for the study is valid and that the study's variables have a long-run relationship.

Table 4.3: Johansen Co-integration Tests

Unrestricted Cointegration Rank Test (Trace)					Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothes	Eigen-Value	Trace Stats	0.05 Crit. Value	Prob. **	Hypothes	Eigen-Value	Trace Stats	0.05 Crit. Value	Prob. **
None *	0.266	138.40	69.819	0.000	None *	0.266	54.635	33.876	0.000
Atmost1*	0.217	83.770	47.856	0.000	Atmost1 *	0.217	43.334	27.584	0.000
Atmost2 *	0.148	40.436	29.797	0.002	Atmost2 *	0.148	28.379	21.132	0.004
Atmost 3*	0.058	12.057	15.495	0.154	At most 3	0.058	10.567	14.265	0.177
At most 4	0.008	1.489	3.841	0.222	At most 4	0.008	1.489	3.842	0.222

Source: Author’s computation (2022)

Johansen Co-integration Tests

The results of the Johansen co-integration tests in Table 4.3 show that, in both the unrestricted cointegration Trace and the Maximum Eigenvalue tests, there are, at most, three cointegrating equations at the 0.05 level of significance. This suggests that the independent and dependent variables have a long-term relationship.

Testing of Null Hypothesis One (H₀₁) with Generalized Method of Moments Results

The null hypothesis one (H₀₁) asserts that the capital structure of listed DMBs in Nigeria is not significantly impacted by bank-specific factors such as profitability, liquidity, credit risk, and deposit structure. The dynamic System GMM panel

model, which was based on trade-off theory, tested this. Equation represents the estimation output in Table 4.2 is stated as follows:

$$BLEV = 0.3547* BLEV(-1) - 1.5651*PROF + 0.2646*LIQ - 0.2805*RSK + 1.1455*BDR.$$

Nonetheless, the model demonstrates a high p-value of 9.1212 (p = 0.3322) for the J-statistic, indicating the validity of each instrument. The coefficient (β) value of profitability, according to the regression output, is -1.5651 (p = 0.0038). This indicates that a significant 1.57 unit drop in book leverage will follow a unit increase in profitability. This result rejects the null hypothesis and accepts the alternative, which states that profitability has a significant and negative impact



on the leverage of listed DMBs in Nigeria. It is statistically significant at the 0.05 level. The p-value for liquidity (LDR) is 0.0102, and its positive estimated coefficient (β) is 0.2646. This suggests that a significant increase in book leverage (capital structure) of 0.27 units will result from a unit increase in the loans to deposit ratio (liquidity). At the 0.05 level, this finding is statistically significant. As a result, the results rejected the null hypothesis and accepted the alternative, according to which the book leverage (capital structure) of listed DMBs in Nigeria is significantly and positively impacted by the loans to deposit ratio (liquidity).

Credit risk has a coefficient of determination (β) of -0.2805 ($p = 0.0485$). Accordingly, a unit increase in bank credit risk will result in a 0.28 unit drop in leverage. Based on this, the null hypothesis was rejected. The alternative hypothesis that profitability has a significant and negative impact on leverage, or the capital structure of listed DMBs in Nigeria was accepted in this result, and this is statistically significant at the 0.05

level. Finally, the bank deposit structure has a positive estimated coefficient (β) of 1.1455 with p-value of 0.0005. This suggests that there will be a significant increase of 1.15 units in leverage (capital structure) for every unit growth in bank deposit structure.

This finding rejected the null hypothesis and accepted the alternative, which states that the bank deposit ratio significantly and positively affects the leverage (capital structure) of listed DMBs in Nigeria. The result is statistically significant at the 0.05 level of significance. In summary, the regression analysis revealed that all of the observed bank-specific factors coefficients (β) had p-values less than 0.05, indicating statistical significance. Thus, we reject the null hypothesis (H_0) and adopt the alternative hypothesis (H_1), according to which the capital structure of listed DMBs in Nigeria throughout the study period is significantly impacted by bank-specific factors such as profitability, liquidity, credit risk, and deposit ratio.

Table 4.2: System Dynamic GMM Panel Results
Dependent Variable: BLEV

Model 1. Variables	Coefficients	Std. Error	t-Statistic	Prob.
BLEV(-1)	0.3547	0.09019	3.9329	0.0020
PROF	-1.5651	0.4370	-3.5818	0.0038
LIQ	0.2646	0.0869	3.0431	0.0102
CRSK	-0.2805	0.1278	-2.1954	0.0485
BDR	1.1455	0.2422	4.7304	0.0005
J-statistic	9.1212			
Prob(J-statistic)	0.3322			

Source: Author's Computation (2023).

Testing of Null Hypothesis Two (H_{02})

The Toda-Yamamoto non-causation MWALD test was employed to examine the null hypothesis, which states that there is no Granger causality relationship between the capital structure variables of listed DMBs in Nigeria and bank-specific factors such as profitability, liquidity, deposit ratio, and credit risk. Table 4.3 displays the findings of the Toda-Yamamoto non-causality MWALD test, which provides an overview of the causal relationship between the capital structure variables of Nigerian listed DMBs and the observed characteristics peculiar to sampled banks.

The proposed hypothesis was tested using the Toda-Yamamoto non-causality MWALD test, which states that there is no granger causality

relationship between the capital structure variables of listed DMBs in Nigeria and bank-specific factors such as profitability, liquidity, credit risk, and deposit ratio. The causal relationship between the capital structure variables of listed DMBs in Nigeria and the observed bank-specific factors is summarised in Table 4.3, which shows the results of the Toda-Yamamoto non-causality MWALD test.

The results of causality links between bank-specific characteristics and leverage revealed that the chi-square (X^2)test-statistics of profitability, liquidity, credit risk and deposit ratio are 5.996 ($p = 0.031$), 5.750 ($p = 0.626$), 2.614 ($p = 0.455$) and 2.067 ($p = 0.559$) respectively. The results further showed that book leverage (BLEV)



in relation to profitability, liquidity, credit risk and deposit ratio has chi-square (X^2) test-statistics of 3.206 ($p = 0.011$), 5.224 ($p = 0.156$), 19.972 ($p = 0.0002$) and 8.007 ($p = 0.046$) while the bank-specific characteristics jointly showed chi-square (X^2) test-statistics of 13.813 ($p = 0.313$). This result demonstrated that the probability values of profitability and liquidity are significant at the 0.05 level, and that the joint and individual variables of

credit risk and deposit ratio were greater than the 0.05 level of significance. Thus, we rejected the null hypothesis (H_0) that posits a bi-directional causal relationship between book leverage and observed bank-specific characteristics (profitability and liquidity). The results further showed that credit risk and deposit ratio do not cause the capital structure of DMBs in Nigeria.

Table 4.3: Toda-Yamamoto Modified Wald Granger Non- Causality Tests

Null Hypothesis: (H_0)	Chi-sq	Df	Prob.	Results
PROF does not Granger Cause BLEV	5.996	3	0.031	Sig. Reject H_0 . No Bi-directional Causal Relationship
BLEV does not Granger Cause PROF	3.206	3	0.011	
LIQ does not Granger Cause BLEV	1.750	3	0.030	Sig. Reject H_0 . Bi-directional Causal Relationship
BLEV does not Granger Cause LIQ	5.224	3	0.047	
CRSK does not Granger Cause BLEV	2.614	3	0.455	Insig. Accept H_0 Sig. @ 0.05 level Uni-directional Causality
BLEV does not Granger Cause CRSK	19.972	3	0.0002	
BDR does not Granger Cause BLEV	2.067	3	0.559	Insig. Accept H_0 Sig. @ 0.05 level Uni-directional Causality
BLEV does not Granger Cause BDR	8.007	3	0.046	

Source: Author's Computation (2023).

Test for the Validity of Trade-off and Pecking order Theories

The Null hypothesis Three (H_{03}): Capital structure decisions for Nigerian deposit money banks do not provide support for the static trade-off and pecking order theories.

In order to determine the most appropriate empirical explanation for the financing behaviour of the banks, the trade-off and pecking order theories were put to the test by contrasting the theoretical framework with empirical findings. To determine which theory best explained the financing decisions made by Nigerian deposit money banks during the study period, despite their differences in characteristics, the theoretical framework in section two and the results displayed in Table 4.5 on the applicability of the trade-off and pecking order theories to capital structure decisions. Using observed explanatory variables like profitability, liquidity, credit risk, and deposit

structure, this study examines the viability of the static trade-off and pecking order hypotheses.

Table 4.5 summarises the hypothesis and presents the expected and observed theoretical indications of the explanatory variables. Based on the predicted and observed signs of the coefficients of the explanatory variables, the consistency of capital structure theories in Nigerian deposit money institutions is tested. The following conclusions are reached regarding whether the management of the banks' capital structure choices offer empirical support for the current ideas.

Profitability

The data analysis in Table 4.4 revealed a negative correlation between the profitability of deposit money banks during the study period and their leverage ratio. The static trade-off theory implies that the best capital structure is a trade-off between the costs of bankruptcy and the net tax advantage of debt financing. Accordingly, there is a



positive correlation between profitability and book leverage since larger, more profitable businesses maintain and employ higher levels of debt financing (Oke & Obalade, 2015; Adesugba & Olalere, 2022). Pecking order theory, however, contends that due to information asymmetries between business insiders and outsiders, firms embrace more risky debt than equity and a greater proportion of internal financing than external financing.

Theoretically, there exists an inverse relationship between profitability and debt ratio. Similarly, the findings of this empirical study indicate a significant negative relationship between book leverage and the coefficient of profitability. This inverse link suggests that our findings are consistent with the pecking order theory, which suggests that businesses prefer to use their own resources (internally generated funds) before pursuing outside funding, as evidenced by the negative association between book leverage and the profitability. Accordingly, the banks should require less debt financing (Myers, 1984).

The idea states that the debt ratio and profitability have an inverse connection. The empirical finding demonstrated a substantial negative relationship between book leverage and the coefficient of profitability. The fact that there is a negative correlation suggests that our findings are consistent with the pecking order theory's predictions, which hold that businesses prefer to use their own assets before pursuing outside funding. As such, the banks should require less debt funding overall (Myers, 1984).

Liquidity

The trade-off theory suggests a positive relationship between debt and liquidity. This is because companies with high levels of liquidity prefer debt since it allows them to cover interest costs during lean times (Aremu et al., 2013; AL-Harby, 2019). Pecking order theory, on the other hand, suggests a negative correlation between debt and liquidity. This was based on the idea that businesses with significant liquidity rely on their internal income sources, or retained earnings, to maintain a lower debt ratio (Ahmeti et al., 2023). Table 4.4 presents our empirical findings, which indicate a strong and positive relationship between book leverage of DMBs in Nigeria and

liquidity. This finding supported the static trade-off theory's significance and the idea that certain very liquid Nigerian banks favour debt since they can repay it even with higher interest rates. This might also be the result of banks employing more interest-paying deposits to take advantage of the tax shields thanks to their access to short-term funding.

Credit Risk

According to the trade-off theory, risk and firm leverage are inversely correlated. That is, a company with erratic cash flows runs the risk of getting into financial difficulties; hence, it needs to stay away from debt financing (Ahmeti et al., 2023). Because risk and the estimated cost of financial distress are causally related, businesses that face significant risk must either reduce their leverage or stop financing with debt (AL-Harby, 2019). Our study's empirical findings also demonstrated a substantial and inverse relationship between book leverage and the banks' credit risk as determined by the loan to deposit ratio. This is in line with trade-off theory, which holds that book leverage has a negative relationship with risk.

Deposit structure

The deposit liabilities are considered as the main source of short-term funding and are used to finance banks' business in order to generate profits (Ramlan and Adnan (2016). According to Allen (2014), the theory of banking supports the idea that deposits are frequently the primary source of funding for banks; for this reason, deposits are calculated as a percentage of the bank's total assets. In other words, it assesses the magnitude of assets financed by public deposits and looks at whether banks that have large deposit volumes also have higher operating costs when they solicit deposits. The ability of the bank to fund its assets from deposits is therefore inversely correlated with the ratio of deposits to total assets. The deposit ratio serves as a measure for banks' low-cost source of liquid capital. Theoretically, the trade-off predicts that leverage and liquidity will positively correlate. According to trade-off theory, our empirical findings also showed a strong and positive relationship between deposit structure and book leverage. This suggests that Nigerian banks relied more on outside funds to fund their operations since they had a larger deposit ratio.



Table 4.5: Test of the Consistency of Trade-off and Pecking order Theories

Explanatory Variables	Trade-off Theory	Pecking order Theory	Empirical Result
Profitability	Positive (+)	Negative (-)	Negative (-)
Liquidity	Positive (+)	Negative (-)	Positive (+)
Credit Risk	Negative (-)	/	Negative (-)
Deposit Structure	Positive (+)	Negative (-)	Positive (+)

Source: Researcher's Compilation from Theoretical & Empirical Results (2022)

V. Discussion of Results

This result of the study provided evidence that Nigerian banks are highly leveraged as they financed their operations through large proportion of debt capital of 86 per cent while remaining 14 per cent represent lower equity capital. This result indicates that Nigerian deposit money banks are highly leveraged in accordance with international standards. The result of leverage is comparable to that of South African banks, which account for 86.9% of total assets (Sibindi & Makina, 2018), and it is near to large US and EU banks, which account for 92.6% of assets (Gropp & Heider, 2010). Furthermore, the result revealed that the mean of deposit structure for the banks of 66.3% is an indication that higher financing source comes from public deposits that are mobilized and collected at a cheaper rate compared to borrowed funds.

The methodology adopted is system-GMM and this is as a result of the nature of banks' capital structure and t-test. The first research question addressed the first objective of whether bank-specific characteristics (profitability, liquidity, credit risk and deposit structure) have impact on capital structure of Nigerian deposit money banks. The study's conclusions indicated that, throughout the study period, all four observed bank-specific variables were determined to have statistically significant explanatory power for the leverage variable of commercial banks in Nigeria.

Firstly, the regression results documented significant and higher magnitude of coefficient of the performance in terms profitability computed by return on asset has a significant and negative relation to leverage (debt ratio) of the Nigerian DMBs during the period of investigation. This shows that deposit money banks that are profitable build up internal reserves and rely increasingly on internal funding to run their business. They become less dependent on outside funding as a result of capital. In addition, it aligns with the pecking order theory, which suggests that profitable banks employ their own resources instead than borrowing from outside investors because they are more aware of the

cost of capital. A preference ranking for sources was established, with internal sources favoured over external debt financing, by bank managers and outside investors due to the negative consequences of moral hazard and adverse selection brought about by information asymmetry. This result is in conformity with earlier empirical research by Gropp and Heider (2010), AlMutairi & Naser (2015), Oke and Obalade (2015), Al-harby (2019), and Sibindi (2018), which found that profitability was a statistically significant factor that negatively explained banks' book leverage in both developed and developing nations. The outcome differs from that of Adesugba and Olalere (2022); Ahmeti et al (2023) who identified a strong and positive association between leverage and profitability. Thus the study's findings demonstrate that a key consideration in deciding on ideal bank capital structure has been profitability.

Furthermore, liquidity ratio measured by loans to deposit ratio has significant and positive impact on book leverage (capital structure) of listed DMBs in Nigeria. That is, the lower the proportion of loans to deposits of banks, the higher the liquidity and the higher the capital structure. The positive sign of the coefficient of loans to deposits ratio conformed to a priori expectation. The result is also consistent with trade-off theory that suggests a positive relationship between liquidity and long-term debt level of firms. Additionally, the book leverage (capital structure) of listed DMBs in Nigeria is significantly and positively impacted by the liquidity ratio as determined by the loans to deposit ratio. That is, more liquidity and a higher capital structure correspond with a lower ratio of loans to bank deposits. The loans to deposits ratio's positive sign was in line with the a priori prediction. The outcome is also in line with trade-off theory, which postulates a positive correlation between a firm's long-term debt load and liquidity. This means that banks with high liquidity reduce their debt to equity ratio when they have more liquid assets and cash. Specifically, they favour long-term capital (equity or debt) financing over short-term debt.



Liquid banks will be able to raise long-term capital at their convenience and at the lowest possible cost thanks to the capital market, and they can even increase their internal equity capital.

Consequently, they raise the capital of their long-term loan, so reducing their financial risk. Furthermore, because liquidity has a beneficial impact on book leverage, banks can now view liquidity as a safety net in times of poor profitability and high cost makes it difficult for them to obtain capital market funding. This outcome is consistent with studies by Aremu et al. (2013) and AL-Harby (2019) that showed a favorable correlation between liquidity and capital structure. The outcome however does not support the findings in Sakumasigba (2018); Ahmeti et al. (2023) which discovered a negative correlation between liquidity and capital structure of banks.

Liquidity and book leverage have a significant, positive and bi-directional causality relationship according to the result in Table 3. This results in a tradeoff between the advantages of having a high degree of liquidity level and financial stability brought about by a suitable capital structure. As a result the study shows that liquidity management may be utilized to choose the right financing option. Additionally, capital structure choices can be taken into account as a method of controlling the liquidity of DMBs in Nigeria through the period under review.

The study also found a strong and negative correlation between bank book leverage and credit risk as assessed by loan to assets. The negative coefficient of credit risk demonstrated that Nigerian banks would employ less debt capital as credit risk increased. The outcome is consistent with the trade-off theory framework, which postulates that a bank's capital structure's level of debt financing decreases as its risk of bankruptcy rises. Nigerian banks will use this to try to avoid taking more on debt than they need to in order to lessen the burden of having to repay it. Furthermore, the outcome lends credence to the idea that banks that creditors perceive as riskier have harder time obtaining long term loans.

In addition, this provides evidence that banks do not use debt to finance their risk assets (loans), but rather they use deposit liabilities in order to moderate the costs. That is, banks need to mobilize more deposits and reduces debt to finance their loans. The result of the study is similar to studies of AL-Mutairi and Nasir (2015); Sakunasigba et al. (2018); AL-Harby (2019) where negative relation was established between risk and leverage but contrary to finding in Sibindi (2018)

where positive relationship was documented. Also, there exist a uni-directional causality relationship running from book leverage to credit risk whereas, credit risk does not ganger cause book leverage of deposit money banks. This implies that the banks' decision to reduce debt financing should not be seen as a choice but an obligation for banks with high risk level, in compliance with regulations in the banking sector.

Furthermore, the result of the deposit structure in the model shows that deposit structure plays an important role in determining capital structure of banks during the period of study. The deposit structure was positively and significantly affects banks' leverage ratio. This indicates that an increase in deposit ratio has substantially and significantly increased the book leverage of Nigerian banks. The Nigerian banks are highly leveraged even though with substantial public deposits that provides liquid funds. The result evidenced that deposits has a significant impact on external funding of banks and aligns with findings in El-Ansary and Hafez (2015); Masoud (2016). This finding is also in tandem with trade-off theory that proposes a positive relationship between liquid funds and book leverage. As a result low costs of generating deposits as a source of financing compared to borrowed funds, majority of Nigeria DMBs increased their deposits mobilization drive in the money market to finance their risk assets (loans) to sustain their performance.

VI. CONCLUSIONS AND RECOMMENDATIONS

Attempt has been made in this research to investigate whether the identified major bank-specific characteristics namely performance in terms of profitability, liquidity, credit risk and deposit affect the decision on capital structure of deposit money banks in Nigeria between 2006 and 2023. The study also investigates whether there is causality relationship between the observed variables of the study as well as testing trade-off and pecking order theories of corporate financing in explaining the Nigerian banks' capital structure. However, this study is unique and different from the previous studies in Nigeria because of the use of variables and methodology which has not been commonly used for the research works on banks' capital structure in the previous studies in Nigeria.

The outcomes of this study provided evidence that deposit money banks in Nigeria are highly levered due to large proportion of public deposits in their total liabilities and this is why banks are most regulated sector of the economy.



This unique feature of Nigerian deposit money banks is in conformity with other developing and developed banking industries as well as in line with global norms. Notwithstanding this special features that make banks differed from other non-financial firms, determinants of their capital structure still similar to that of non-financial firms.

The evidence emanating from the study proved statistically that the identified bank-specific factors such as profitability, liquidity, credit risk and deposit structure successfully explained the capital structure of DMBs in Nigeria, and these factors were in conformity with expected signs based on available theories and existing literature reviewed. The results showed that banks' capital structure was significantly affected by profitability and credit risk negatively, on the other hand capital structure of deposit money banks in Nigeria were affected by the composition of liquidity and deposit significantly and positively.

The study equally demonstrated the existence of a bidirectional, significantly positive causal relationship between capital structure, liquidity management, and profitability. This relationship creates a trade-off between the advantages of financial stability brought about by an appropriate capital structure and profitability, liquidity management, and financial stability. The study concluded as a result of the findings that capital structure decisions should be viewed as a strategy for the management of profitability and liquidity of DMBs in Nigeria and that the combined effect of profitability and liquidity management can be adopted for the determination of the appropriate financing mix.

The outcome of the study established the existence of a relationship between banks' capital, liquidity, credit risk and deposit structure and the expectations of trade-off theory while it concluded that capital structure and profitability conformed to pecking order theory.

Consequently, the study showed that the trade-off theory and pecking order theory can be used to unravel the financial behaviour of Nigeria banks and that they are similar to that of non-financial firms in several ways. It concluded that there is no universally accepted theory that is capable of explaining capital structure decisions of banks.

In general, the findings from the study have shed more light on the Nigerian banks' capital structure decisions hence, the investors and policymakers alike will find this study outcomes as beneficial. The identification of critical component needed to create economic plans and the factors

influencing bank funding decisions to manipulate the proper capital needed by Nigerian banks will be helpful to policymakers.

Secondly, by gaining a better understanding of the variables that could affect Nigerian banks' judgment concerning their capital structures, creditors, bank managers and financial analyst should be able to invest and compete more successfully in the banking industry. Like all empirical research, there are certain limitations to this study. The analysis excluded additional factors identified as determinants of non-financial enterprises that may have an impact on banks' capital structure and was restricted to the core variables unique to banks listed on Nigeria Stock Exchange. As a result, extrapolating the outcome to other industries and nations may not be possible. Future studies should not only concentrate on how macroeconomic factors influence the capital structure of financial firms but also non-financial firms in developing nations especially Nigeria. Based on the outcomes of the study, several policy recommendations are suggested for the regulation and policymaking concerning deposit money banks in Nigeria and these are:

Firstly, bank management should prioritize factors such as profitability, liquidity levels, effective credit management, and deposits mobilization when making capital structure decisions. These factors are crucial for ensuring financial stability, especially during stressed market conditions. Therefore, regulators and policymakers should encourage banks to assess and manage these factors effectively to minimize risks and maximize value.

Secondly, banks should adhere closely to the principles of the pecking order theory by utilizing internal sources of funding before resorting to external debt financing. Moreover, the trade-off theory predicts that debt financing can be beneficial, particularly through the mobilization of public deposits for short-term borrowing to finance investments. Regulators should provide guidelines to ensure banks follow these theories effectively, balancing debt and equity financing to achieve profitability and maximize shareholders' wealth.

Thirdly, in view of the observed link between profitability, liquidity management, and capital structure, banks should strive to maintain adequate profitability while also holding sufficient liquid assets or cash reserves. This approach ensures that banks can meet their financial obligations, especially during periods of fund scarcity or when existing funding sources need renewal. Regulators should enforce regulations that encourage banks to



maintain optimal levels of profitability and liquidity to enhance financial stability and reduce liquidity problems.

Finally, these recommendations emphasize the importance of prudent management practices and adherence to established financial theories in guiding capital structure decisions of deposit money banks in Nigeria. Effective implementation of these recommendations can contribute to the stability and sustainability of the banking sector, ultimately benefiting the broader economy.

VII. Contributions

The outcome of this empirical study contributed to the literature on capital structure decision of banks, most especially it will be of immense importance to researchers, policy makers, regulators and practitioners. Investors and shareholders can avail themselves of the outcome of this study to determine the appropriate financing decisions that will maximize value for the banks at lower costs for the purpose of meeting the optimal financial requirements of their banks.

Acknowledgements

This research work was sponsored by the Tertiary Education Trust Fund (TetFund) through the Institution Based Research (IBR) grants received to finance the research project from the proposal stage to the final completion and publications of the paper. We also declare that the authors do not have personal interest and bias that could affect the outcome of this project work.

REFERENCES

- [1]. Abass, F., Iqbal, S., & Aziz, B. (2019). The impact of bank capital, liquidity and credit risk on profitability in post-crisis period: A comparative study of US and Asia. *Cogent Economics and Finance*, 7, 1–18.
- [2]. AbuTawahina, M. S. (2015). Capital structure and firms' financial performance: Evidence from Palestine. *Islamic University, Gaza*.
- [3]. Adesugba, A. K. & Olalere, V. D. (2022). The Determinants of Capital Structure of Listed Deposit Money Banks in Nigeria. *International Journal of Management and Commerce Innovations*, 9(2), 157-168.
- [4]. Ahmeti, Y., Kalimashi, A., Ahmeti, A. & Ahmeti, S. (2023). The Capital Structure Determinants of Banking Sector of Western Balkan Countries. *Ekonomika*, 102(1), 102-121.
- [5]. Aktas, R., Acikalin, S., Bakin, B. & Celik, G. (2015). The Determinants of Banks' Adequacy Ratio: Some Evidence from South Eastern European Countries. *Journal of Economics and Behavioural Studies*, 7 (1), 79-88.
- [6]. Al-Harby, A. (2019) Factors Affecting Capital Structure of Conventional and Islamic Banks: Evidence from MENA Region. *Global Review of Islamic Economics and Business*, 7(2), 69-80
- [7]. Aljamaan, B. (2018). Capital structure: Definitions, determinants, theories and link with performance literature review. *European Journal of Accounting, Auditing and Finance Research* 6 (2), 49 – 72.
- [8]. Allen, F., Carletti, E. & Marquez, R. (2015). Deposits and bank capital structure. *Journal of Financial Economics*, 118(3), 601-619.
- [9]. AL-Mutairi, A. N. & Naser, K. (2015). Determinants of capital structure of banking sector in GCC: An empirical investigation. *Asian Economic and Financial Review*, 5 (7), 959–972.
- [10]. Aragaw, H. A. (2015). The impact of capital structure on profitability of commercial banks in Ethiopia. Addis Ababa University.
- [11]. Aremu, M. A., Ekpo, I. C., Mustapha, A. M., & Adedoyin, S. I. (2013). Determinants of capital structure in Nigerian banking sector. *International Journal of Academic Research in Economics and Management Sciences*, 2(4), 27 – 43.
- [12]. Carin, R. (2011). Bank Capital structure and Capital Requirement. Thesis for Master in
- [13]. Economics, Lund University Faculty of Economics 1-39. DOI: [10.13140/2.1.1603.8405](https://doi.org/10.13140/2.1.1603.8405)
- [14]. Diamond, D. W., & Rajan, R. G. (2000). A theory of bank capital. *The Journal of Finance*, 55(6), 2431–2465.
- [15]. El-Ansary, O. A., & Hafez, H. M. (2015). Determinants of capital adequacy ratio: An empirical study on Egyptian banks. *Corporate Ownership & Control*, 13(1), 1–10.
- [16]. Eniola, O. J., Adewunmi, A. A., & Akinselure, O. P. (2017). Impact of capital structure on the profitability of selected quoted banks in Nigeria. *International Journal of Economics, Commerce and Management*, 5(1), 543 – 551.
- [17]. Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably



- important? *Financial Management*, 38(1), 1–37.
- [18]. Ghasemi, M. & Ab Razak, N. H. (2016). The Impact of Liquidity on the Capital Structure: Evidence from Malaysia. *Internal Journal of Economics and Finance*, 8 (10), 130 – 139.
- [19]. Ghosh, S. and Chatterjee, G. (2018). Capital structure, ownership and crisis: How different are banks? *Journal of Financial Regulation and Compliance*, 26(2), 300 - 330.
- [20]. Gropp, R., & Heider, F. (2010). The determinants of bank capital structure. *Review of Finance*, 14, 587 – 622.
- [21]. Iskandar, N. M. & Arshad, N. C. (2019). Bank Specific Characteristics and Profitability of Islamic and Conventional Banks in Malaysia. *International Journal of Islamic Business*, 4 (1), 39 - 53
- [22]. Iwarere, H. T., & Akinleye, G. T. (2010). Capital Structure Determinants in the Nigerian Banking Industry: Financial Managers' Perspectives. *Pakistan Journal of Social sciences*, 7(3), 205- 313.
- [23]. Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, 28(4), 923–931.
- [24]. Kumar, L. S. (2017). Theoretical Framework on Capital Structure and Firm's Performance. *International Journal of Interdisciplinary Research in Arts and Humanities*, 2 (2), 155-159.
- [25]. Kythreotis, A., Nouri, B. A., & Soltani, M. (2018). Determinants of capital structure and speed of adjustment: Evidence from Iran and Australia. *International Journal of Business Administration*, 9 (1), 88–113.
- [26]. Marandu, K. R., & Sibindi, A. B. (2016). Capital structure and profitability: An empirical study of South African banks. *Academic Investigations & Concepts Section 1, Corporate Ownership & Control*, 14(1), 8–18.
- [27]. Masoud, N. (2016). The determinants of capital structure choice: Evidence from Libyan firms. *Research Journal of Finance and Accounting*, 5(1), 67–83.
- [28]. Modigliani, F. & Miller, M. H. (1958). The Cost of Capital Corporation, Finance and the Theory of Investment. *The American Economic Review*, 48(3):261-297.
- [29]. Mohammed, R. I., Gewdan, K. M. A. & Babela, I. S. T. (2017). Factors Affecting Capital Structure of The Banks Listed On Iraqi Stock Exchange. *Humanities Journal of University of Zakho (HJUOZ)*; 5(2) 487– 495.
- [30]. Mohammad, K. U. (2022). How bank capital structure decision-making change in recessions:
- [31]. Covid-19 evidence from Pakistan. *Asian Journal of Economics and Banking*, 6(2), 255-269.
- [32]. Muigai, R. G. (2016). Effect of Capital Structure on Financial Distress of Non-Financial Companies Listed in Nairobi Security Exchange. (Phd Thesis, COHRED, Finance, JKUAT).
- [34]. Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39(3), 574-592.
- [35]. Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187–221.
- [36]. Myer, S. C. (2001). Capital Structure. *Journal of Economic Perspectives*, 15 (2), 81–102
- [37]. Oke, M. O. & Obalade, A. A. (2015). Testing The Validity Of Optimal Capital Structure Theory In Nigerian Listed Oil Firms. *International Journal of Economics, Commerce and Management United Kingdom*, III(3), Sakunasingha, B., Anekwasinchai, P. and Wiriyawit, V. (2018) Capital Structure Determinants for Local Commercial Banks: Thailand Evidence. *Catalyst*, 18, 18-29.
- [38]. Salawu, R. O. (2007). The determinants of the capital structure of financial firms in Nigeria: The financial managers' perspectives. *Global Journal of Business Research*, 1(1), 60.
- [39]. Sha'ban, M., Girardone, C., & Sarkisyan, A. (2016). The determinants of bank capital structure: A European study. *Essex Business School*.
- [40]. Sibindi, A. B. and Makina, D. (2018). Are the determinants of banks' and insurers' capital structures homogeneous? Evidence using South African data. *Cogent Economic & Finance*, 6 (1), Sibindi, A. B. (2018) Determinants of Bank Capital Structure: Evidence from South Africa. (*Economica AUDCE*, 14(5), 108-126
- [41]. Swai, T. A. (2019). Impact of Capital Structure on the Portfolio Behaviour of Commercial Banks in Tanzania. *African Journal of Economic Review*, VII (2), 60 – 77.
- [42]. Tengku, W.R. H., Nazrol, K. M.K., Razali, H. and Zulkufly, R. (2020). Determinants of



- bank capital structure: A review of
Theoretical and Selected Empirical Research.
[43]. International Journal of Business and Social
Science, 11(12), 131 – 141.