

FUNDING STRUCTURE AND PROFITABILITY IN NIGERIAN BANKING SECTOR: EVIDENCE FROM BANK DEPOSIT, MONEY MARKET FUNDING, AND CAPITAL STRUCTURE

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Abstract

This research examined the impact of funding structure on bank profitability in Nigeria, utilizing time series data from 1990 to 2023. The study utilized the Ho and Saunders Dealership Model as its theoretical framework and implemented the Autoregressive Distributed Lag (ARDL) methodology to analyses both short-term and long-term dynamics. The variables analyzed in the funding structure encompassed deposit funds, money market funds, and capital structure, whereas the profitability metric utilized was return on assets (ROA). The results showed that money market funds and capital structure had a significant negative effect on banking sector profits. Deposit funds, on the other hand, were not significant but still hurt profits. The study showed that relying on money market funding and having weak deposits and capital structure can hurt profits. These results helped policymakers and bank managers think about new ways to fund banks and new rules to make banks in Nigeria more stable and better at what they do.

Keywords: ARDL, Bank profitability, Funding Structure, Interest Rate Speed.

Introduction

The profitability of the banking sector around the world depends on how well financial intermediation works. This is when banks move money from units that have too much to units that have too little, mobilize deposits, extend credit, and keep liquidity reserves (Utor et al., 2023; Yua et al., 2024; Gjorgji & Goran, 2019; Mwamtambulo & Ntulo, 2018). When the functions of mobilization and allocation are done well, the best returns are achieved. However, the cost of intermediation, which is often shown in interest rate spreads, can affect this. In Nigeria, as in other places, interest rates and the cost of funding sources affect how profitable a business is. Banks use a variety of funding options (Epor et al., 2023). Funding structure includes all the ways that assets are paid for, such as equity, debt, and liabilities. Capital structure, on the other hand, is a part of funding structure and includes equity, long-term debt, and permanent short-term debt (Ubesie, 2016). The mix and cost of these sources of funding have a big impact on banks' ability to make money from their assets and stay profitable. This shows how funding strategies and financial performance are related.

Funding structure, which is the mix of customer deposits, money market funds, equity, and debt that banks use to pay for their assets, has become a key factor in how profitable the banking sector is. Banks usually use deposits to act as intermediaries, but they can also get money from a variety of sources, such as savings accounts, term deposits, certificates of deposit, interbank markets, and long-term capital. This makes their operations more flexible and cost-effective (Utor et al., 2023; Olaifa, 2018; Ndirangu & Ochiri, 2018). In a competitive and changing financial environment, the right balance between short-term debts and long-term loans affects not only the cost of borrowing but also the level of risk, the amount of money that can be lent, and, in the end, the amount of money that can be made.

Despite reforms aimed at making the banking sector in Nigeria more efficient, competitive, and high-quality (El-Chaarani & El-Abiad, 2019), it has continued to have trouble making money. After the 1986

Structural Adjustment Programme, deregulation made rules less strict, but over time it made the market less competitive and more concentrated. From 1990 to 2021, deposit funds grew from 5.56% of GDP to 12.24%. However, returns on assets only improved slightly, and periods of increased capital, like during the global financial crisis of 2008–2009, did not increase profitability, with ROA dropping sharply (CBN, 2023). Costs of financial intermediation are going up, especially when banks have to borrow money from the money market and other banks at high rates because they don't have enough deposits. This has made the system less efficient (Ndugbu et al., 2016; Tanko et al., 2021; Mishkin, 2001). In order to stay profitable, there is the high tendency to pass these costs on to borrowers while keeping deposit rates low, there dislocating the financial intermediation process of banks (Assirri & Hebbbar, 2021).

Previous research has not looked closely at how different types of funding affect bank profitability in Nigeria because they either looked at non-bank sectors, only looked at parts of the capital structure, or didn't take into account how different types of funding work together. For example, Ogbada et al. (2021) and Demyana and El Hadidi (2020) only looked at non-financial companies, and Tanko et al. (2021) only looked at capital structure in non-financial companies, leaving out deposit and money market funding. Assirri and Hebbbar (2021) looked at capital structure and bank performance, but they didn't look at how equity, deposits, and other funding sources work together to explain profitability. Lestari and Indarto (2021) looked at issuing debt securities but left out the effects of short-term funding on cost efficiency. Haddaweea and Flayyihb (2020) looked at deposits and profits, but they didn't look at capital market funding. Tripathy and Shaik (2020) talked about leverage and profitability, but not in the context of Nigerian banks. Overall, there hasn't been much research on the different ways that a bank's funding mix affects its profitability.

This study aims to fill in the research gap that previous studies left behind by looking at non-bank sectors, parts of capital structure in isolation, or not looking at how different funding sources interact with each other. It does this by providing a full analysis of how funding structure affects bank profitability in Nigeria. In particular, it wants to look at how bank deposit funds affect profits, how money market funding affects profits, and how capital structure affects profits in the Nigerian banking sector. The study fills a gap in the research by combining these funding sources into a single framework. This is because there isn't enough real-world data on how traditional deposits, short-term market funding, and long-term capital structure decisions all affect profitability at the same time. The study's contribution is that it focusses on a specific sector and is based on Nigeria's deregulated but structurally concentrated banking environment. It also has the potential to help funding strategies that find a balance between low costs, competitive lending rates, and long-term asset returns.

Methods

Research Design

The research design adopted in this study falls within the paradigm of an Ex-post facto design type. In the context of this design, the reason is that the events observed, in this case funding structure, and bank profitability in the banking sector in Nigeria, have already taken place.

This research work is analytical in nature and adopts a multiple regression analysis, which is based on historical and survey research designs to gather secondary data, to determine the extent of relationship between financial intermediation efficiency and financial structure in the banking sector. Hence, the study intends to review and evaluate the funding structure with the view to ascertaining their effectiveness in determining bank profitability, and making possible recommendations for improvement to make the Nigerian banking industry more efficient.

Data Collection Procedure

This study will rely mainly on secondary data. The secondary data involves are carefully collected from the World Bank data base and Central Bank of Nigeria (CBN) statistical bulletin. Again, to achieve the stated objectives of this study, annual time series data for the period 1990-2023 will be sourced and used. Other available sources of data used include Journals, Books and Magazines etc. which are relevant to this study. The data sourced were all decomposed as percentage of banking sector total assets for uniformity in units.

Model Specification

When assessing the profitability of a banking industry, there is a quite specific structure most studies follow. Generally, data points of several banks are gathered over a multi-year period. These data points are then put into a model, which can be (very generally) described as follows:

$$\text{Profitability} = \alpha_0 + \alpha_1 * \text{factor 1} + \alpha_2 * \text{factor 2} + \dots + \alpha_n * \text{factorn} + \varepsilon \quad 3.1$$

The dependent variable is therefore a profitability metric, which is determined by several factors. $\alpha_1, \alpha_2, \dots, \alpha_n$ are the coefficients for each factor (the amount by which a one-unit increase in the factor influences the profitability metric) and ε is the error term. For this study, most of the studies reviewed use the abovementioned structure (Manurung, 2015; Demyana & El Hadidi, 2020; Patrisia, 2020; Assirri & Hebbbar, 2021; Ogbada, Jones, Nmesirionye & Ibiom, 2021). In this case funding structure. We could also expand the factors to include interest rate spread. So that we get:

$$\text{Profitability} = \alpha_0 + \alpha_1 * \text{funding structure} + \alpha_2 * \text{insterest rate spread} + \varepsilon \quad 3.2$$

The literature used some different measures of bank profitability, these measures include accounting – basing measures calculated from firms' financial statements such as ROA, and ROE (Ubesie, 2016; Assirri & Hebbbar, 2021; Ibrahim, 2019; Ogbada, Jones, Nmesirionye & Ibiom, 2021) also used two common accounting–based performance measures to evaluate the bank profitability to be ROE and ROA, in which ROA is computed as the ratio of net profit to average total assets. Therefore, the above equation becomes:

$$\text{ROA} = \alpha_0 + \alpha_1 * \text{funding structure} + \alpha_2 * \text{insterest rate spread} + \varepsilon \quad 3.3$$

Funding structure is one of the most incomprehensible matters in finance literature (Tanko, Siyanbola, Bako & Dotun, 2021). Capital structure, being the subset of funding structure, is the mixture of both debt and equity used by banks or any organisation to finance its business for the purpose of generating profit or rendering service to consumers with the ultimate expectation of return. In addition, short-term debt is as well part of the capital structure. Debt is one of the sources that companies can raise capital in the capital market. Firm sometime preferred debt to equity in order take advantage of tax, if firm finances its business with debt the interest on debt is exempted from tax while debtholders pays taxes on their interest income. Debt is most available to be access and with low interest rate while equity is quite expensive than debt.

Again, the fund and liquidity management strategies of banks also make them rely on money market instruments to enable banks meet deposit and loan demands (Ekmekaoglu, 2013). Examples of such strategies include holding of short-term financial assets to maintain regulatory requirements, issuing short-term securities to meet depositors' demands and make investment profits. A portfolio of short-term money market securities held by a bank can be easily sold or rediscounted for cash. When Central Bank actions and regulations restrict the profit-making activities and operations of banks, they search for alternative ways of making profit (Atanda & Ajayi, 2012). The effects of this alternative venture is in the patronage of money market investment. That means when banks get shortfall of funds from traditional deposit sources, they resort to money market and interbank options (Ndugbu, Duruechi & Ojiegbe, 2016). Hence the funding structure considered from literatures are deposits (DF), capital structure funds (CSF) and money market funding (MMF). So, equation 3.3 becomes,

$$\text{ROA} = \alpha_0 + \alpha_1 * \text{DF} + \alpha_2 * \text{CSF} + \alpha_3 * \text{MMF} + \alpha_4 * \text{insterest rate spreads} + \varepsilon \quad 3.4$$

So, equation 3.4 becomes,

$$\text{ROA} = \alpha_0 + \alpha_1 * \text{DF} + \alpha_2 * \text{CSF} + \alpha_3 * \text{MMF} + \alpha_5 * \text{IRS} + \alpha_6 * \text{DRS} + \varepsilon \quad 3.5$$

In addition to the above-mentioned variables, this study included some control variables such as bank size (BSZ), bank liquidity (BLQ), financial development (FD). The bank size is measured by the log of the firm's total assets (Demyana & El Hadidi, 2020). While Deesomsak, Paudyal and Pescetto (2004) have found that size and firm leverage are positively related, Chen (2004), on the other hand, found that size and firm leverage are negatively related. Again, Dieu, Dinh, Thai, and Thuy (2019) suggest that firm's size and liquidity may influence firm performance, as well financial development (aggregate deposit to GDP) depressing the non-interest income of Nigerian banks. These control variables are selected empirically to better extract the effect of funding structure and interest rate spread on bank profitability. Again, equation 3.5 becomes:

$$ROA = \alpha_0 + \alpha_1 * DF + \alpha_2 * CSF + \alpha_3 * MMF + \alpha_4 * IRS + \alpha_5 * DRS + \varepsilon \quad 3.5a$$

Where,

- ROA - bank profitability
- DF - deposit funds
- MMF - ratio of money market funding
- CSF - capital structure funds (i.e., proportion of equity to debt capital funds)
- IRS - interest rate spread
- DRS - Discount Rate Spread
- α_0 - Intercept of the model
- ∂_i, β_i - Coefficient of variables
- ε - represents the residual.

Data Analysis

The study adopted the Autoregressive Distributed Lag (ARDL) multiple regression method in estimating the effects of funding structure on bank profitability; and effects of funding structure on interest rate spread in the Nigeria. Before the model was estimated, the properties of the variables were examined to substantiate the stationarity and long run relationship of the variables. This is as a result of most time series data being prone with unit roots problem (Epor, 2024). The econometric tools that were employed for these verifications are sequentially presented below:

This study adopts the Augmented Dickey-Fuller (ADF) unit root test procedure. The test specifies that:

$$\Delta y_t = \beta + \delta t + \theta y_{t-1} + \sum_{i=1}^q \gamma_i \Delta y_{t-i} + \varepsilon_t \quad 3.7$$

$$\Delta \Delta y_t = \beta + \delta t + \theta \Delta y_{t-1} + \sum_{i=1}^q \gamma_i \Delta \Delta y_{t-i} + \varepsilon_t \quad 3.8$$

Where q is the maximum lag length and it is determined automatically by the Akaike information criterion (AIC) lag order selection criterion.

The ADF test at level is denoted by equation 3.3 and that for first difference is denoted by equation 3.7 and 3.8. Conducting the ADF test for first difference is necessary if the variable is non-stationary at level.

The research utilized the ARDL model, also called bounds testing method as suggested by Pesaran, Shin and Smith (2001), to examine the relationship effects of funding structure on bank profitability.

Pesaran, Shin and Smith (2001) advocated that the use of the bounds technique is based on three validations: first, the use of the ARDL model for the estimation of level relationships; second, the bounds test allows a mixture of I(1) and I(0) variables as regressors; and third, this technique is suitable for small or finite sample size (Pesaran, Shin & Smith, 2001).

The bounds testing approach involves estimating the following equation as postulated by Pesaran, Shin and Smith (2001):

$$\begin{aligned} \Delta ROA_t = & \alpha_0 + \alpha_1 ROA_{t-i} + \alpha_2 DF_{t-i} + \alpha_3 MMF_{t-i} + \alpha_4 CSF_{t-i} + \alpha_5 IRS_{t-i} + \alpha_6 DRS_{t-i} + \partial_1 \sum_{i=1}^a \Delta ROA_{t-i} \\ & + \partial_2 \sum_{j=1}^b \Delta DF_{t-j} + \partial_3 \sum_{k=1}^c \Delta MMF_{t-k} + \partial_4 \sum_{l=1}^d \Delta CSF_{t-l} + \partial_5 \sum_{m=1}^e \Delta IRS_{t-m} \\ & + \partial_6 \sum_{n=1}^f \Delta DRS_{t-n} + \mu_t \end{aligned} \quad 3.9$$

Where,

- t = time
- α_0 and ϕ_0 = intercepts
- $\alpha_1 - \alpha_6$ and $\phi_1 - \phi_5$ = long-run coefficients
- $\partial_1 - \partial_6$ and $\psi_1 - \psi_5$ = short-run coefficients
- μ_t and ε_t = white noise error terms

Δ = difference operator.

Expressions without summation sign = Long-run relationship

Expressions with Summation signs = short-run dynamics

After estimating (3.9), the Wald test (F -statistic) is computed to test for the long-run relationship between the variables. The computed F -statistic value is then evaluated with the tabulated critical values. According to Pesaran, Shin and Smith (2001), there are three possible decisions that will be derived from the ARDL bounds test:

- i. If the computed F -statistic is smaller than the lower bound value, then the null hypothesis is not rejected and the conclusion is that there is no long-run relationship;
- ii. If the computed F -statistic is greater than the upper bound value, then the model variables share a long-run level relationship; but,
- iii. If the computed F -statistic falls between the lower and upper bound values, then the results are inconclusive.

ARDL Long-Run Estimation

Once cointegration is established between bank profitability and monetary policy, the conditional ARDL long-run model can be specified as postulated by Epor (2024):

$$ROA_t = \gamma_0 + \gamma_1 ROA_{t-i} + \gamma_2 DF_{t-i} + \gamma_3 MMF_{t-i} + \gamma_4 CSF_{t-i} + \gamma_5 IRS_{t-i} + \gamma_6 DRS_{t-i} + \varepsilon_t \quad 3.11$$

Where,

γ_0 and δ_0 = long-run intercepts

$\gamma_1 - \gamma_6$ and $\delta_1 - \delta_6$ = coefficients of long-run estimates

ε_t and η_t = error term of long-run estimates

Short-Run and Error Correction Model Estimates

In the next step, we obtain the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. This is specified as follows:

$$\Delta ROA_t = \lambda_0 + \lambda_1 \sum_{i=1}^a \Delta ROA_{t-i} + \lambda_2 \sum_{j=1}^b \Delta DF_{t-j} + \lambda_3 \sum_{k=1}^c \Delta MMF_{t-k} + \lambda_4 \sum_{l=1}^d \Delta CSF_{t-l} + \lambda_5 \sum_{m=1}^e \Delta IRS_{t-m} + \lambda_6 \sum_{n=1}^f \Delta DRS_{t-n} + \omega ECT_{t-1} + \theta_t \quad 3.13$$

Where,

ECT = error correction term derived from equation (3.11), and

ω and φ = the speeds of adjustments.

The error correction model shows the speed of adjustment needed to restore the long run equilibrium following a short run shock. The α_1 is the coefficient of the error correction term in the model and must be negative and significant for the return back to long-run equilibrium to hold (Pesara, Shin & Smith, 2001).

Result

The data used in the research have been summarized in table 1, using descriptive analysis in the form of mean, standard deviation, minimum and maximum. The number of observations (34) represent the years covered by the study. The profitability of the Nigerian banking sector was 1.033% on the average. This means that the weight of favourable return is more than that of losses from 1990 to 2023. This suggest how attractive that sector is to investors. The average of IRS was 18.72% from 1990 to 2023. This simply shows that gap of funds income over funds cost. This level is considered too wide to support financial intermediation. A situation that will discourage deposit funds into the banking system.

Table 1: Descriptive Statistics for Nigeria.

	ROA	IRS	CSF	DF	MMF	DRS
Mean	1.033775	18.72003	92.36148	31.84309	7.147063	11.06885
Median	1.841045	19.43000	93.48761	32.52782	7.622784	10.09000
Maximum	3.800280	27.23164	100.0000	44.29602	12.16197	18.10662
Minimum	-23.25714	6.510000	81.82214	20.09526	1.564948	0.837500
Std. Dev.	4.463172	5.973198	6.726589	7.128688	3.007788	4.266696
Skewness	-5.088729	-0.474943	-0.355998	-0.038643	-0.181369	-0.076922
Kurtosis	28.28959	2.347215	1.659698	1.823759	1.883373	2.299534
Jarque-Bera	1021.823	1.826568	3.167104	1.910583	1.895349	0.707190
Probability	0.000000	0.401204	0.205245	0.384700	0.387642	0.702159
Observations	34	34	34	34	34	34

Source: CBN Statistical Bulletin 2023.

The average of CSF was 92.36% from 1990 to 2022, meaning that banks used more of equity funds as against debt funds. An equal use of both capital funds would have seen the average value at 50%. This further support the claim that Nigerian banks are risk averse entities. With regards to their ratios to total assets, Nigerian banks have used more of deposit funds than money market funds. This is evidenced in the average of DF, that is 31.84%, exceeding MMF, that is 7.14%. The DRS also presents some interesting information as presented in table 4.2. the average spread of DRS of 11.06% means that Nigerian banks have an average markup 11.06% over the funds obtained from the CBN. This situation presents another worrying situation for the CBN. A markup of 11.06% appears detrimental to the developmental agenda of any CBN policy drive. This figure also means that Nigerian banks are acting more like merchants, and by so doing they will disconnect from the developmental process.

Deposit funds was discovered to be more volatile than all the other variables considered for this study. This is evident in the standard deviation value of 7.12 being the highest in the data set. A volatile deposit funds is a position of concern for the CBN as banks can be exposed to wholesale funds rather than core deposits. Finally, only banking profitability is not normally distributed as the probability of its Irque-Bera statistic is less than 0.05.

Correlation Analysis

The coefficients shown in the Pearson Correlation Coefficient matrix in table 2 indicates the strength of the linear relationship between the variables. From the Pearson Correlation Coefficient Matrix in table 2, it is observed that the correlation coefficients between Nigerian banking sector performance and capital structure funds was positive. A situation that suggests that profitability in the Nigerian banking sector and capital funds tends towards the same direction. On the other hand, bank profitability had negative relationship with deposit funds, money market funds, interest rate spreads and discount rate spreads. However, none of this correlated relationship was significant as their respective probability values were greater than 0.05.

Table 2: Correlation Analysis Between and Among Variables.

Variable	ROA	IRS	CSF	DF	MMF	DRS
ROA	1					
IRS	-0.041	1				
CSF	0.026	-0.571***	1			
DF	-0.102	0.513***	-0.702***	1		
MMF	-0.186	-0.229	0.198	-0.606***	1	
DRS	-0.271	0.751***	-0.704***	0.728***	-0.352**	1

Note. * $p < .10$, ** $p < .05$, *** $p < .01$.

The other form of analysis to take from the correlation matrix is that of finding the possibility of multicollinearity. When two independent variables have high correlation of not less than +0.8/-0.8, they are termed to have high correlation and it will suffice for one of them to be dropped to solve the problem of multicollinearity. From the correlation table in table 4.3, the highest linear association was 0.75 (that is, between interest rate spreads and discount rate spreads). This is lower than the 0.80 threshold, and so our variables looks good to be combined for the proposed model estimation.

Stationarity Tests:

The use of ARDL models does not impose pre-testing of variables for unit root problems because this estimation can accommodate I(0) and I(1) variables, or mutually cointegrated variables, but because of the condition that does not accommodate series that are integrated of order 2, it becomes necessary to conduct unit root tests for the series (Epor, 2024). According to the principle of Difference-stationary, if a time series can be made stationary by differencing, it is said to contain a unit root, order wise it does not. The order of integration of the time series was investigated by applying the Augmented Dickey and Fuller test as presented in table 3.

Table 3: Stationarity Tests at Levels and First Difference

Variables	ADF Tests: Levels			ADF Tests First Difference			Order of Integration
	ADF Test Statistic	Test critical values @ 5%	prob.	ADF Test Statistic	Test critical values @ 5%	prob.	
ROA	-6.1270	-2.9571	0.0000				I(0)
MMF	-1.8931	-2.9571	0.3312	-4.7777	-2.9604	0.0006	I(1)
DF	-0.9881	-2.9571	0.7455	-5.6956	-2.9604	0.0000	I(1)
CSF	-1.5337	-2.9571	0.5040	-6.7264	-2.9604	0.0000	I(1)
IRS	-2.3248	-2.9571	0.1707	-5.9355	-2.9640	0.0000	I(1)
DRS	-2.7137	-2.9571	0.0828	-7.0910	-2.9640	0.0000	I(1)

Source: CBN Statistical Bulletin 2023.

The ADF tests represented in table 4.4 rejected the null hypothesis of the presence of unit root at levels for banking sector profitability, because its test statistics was greater than 3.0 and produced a probability less than 5%. So ROA series is integrated of order zero, that is I(0). On the other hand, the ADF test fails to reject the null hypothesis of no unit root for Deposit funds, money market funds, capital structure funds, interest rate spreads and discount rate spreads at levels. However, they became stationary at first difference, making them integrated of order one, that is I(1). It was established by Pesaran, Shin and Smith (2001) that the bounds technique allows a mixture of I(1) and I(0) variables as regressors. Based on this ground, we proceed to perform

the ARDL bounds test for cointegration.

ARDL Bounds Test for Cointegration

In this section, we proceed to investigate long-run cointegration, where Nigerian banking sector profitability variable is tested as the dependent variable. The calculated F-statistics report is in Table 4.5. The estimated F-statistics of the ARDL bound testing to be compared with the critical value proposed by Pesaran, Shin and Smith (2001).

Table 4: ARDL Bounds Tests for bank profitability for Nigeria

ROA MODEL			
F-statistic	13.9853		
Bounds Test Statistic	I(0)	I(1)	
10%	1.81	2.93***	
5%	2.14	3.34***	
2.5%	2.44	3.71***	
1%	2.82	4.21***	

Source: CBN Statistical Bulletin 2023.

The study observed that the two F-statistics were greater than the respective computed upper bound of critical values from the linear ARDL bounds tests. It signifies the existence of long-run cointegration in the models involving, (i) Nigerian banking sector variables, interest spreads and funding sources, and (ii) interest rate spreads and funding sources. In particular, when the profitability of the Nigerian banking sector was modelled as the dependent variable, estimated F-statistics values were greater than the upper bounds critical values at 10%, 5%, 2.5% and 1% significance level (that is, $13.9853 > 2.93, 3.34, 3.71$ and 4.21 respectively). So, one can conclude that bank funding sources, interest rate spreads and Nigerian banking sector profitability move together in the long-run for the period 1990-2022.

Similarly, when the interest rate spreads in the Nigerian banking sector was modelled as the dependent variable, estimated F-statistics values were greater than the upper bounds critical values at 10%, 5%, 2.5% and 1% significance level (that is, $10.53233 > 3.52, 4.01, 4.49$ and 5.06 respectively). So, one can conclude that interest rate spreads and bank funding sources in Nigeria move together in the long-run for the period 1990-2022.

Model Estimations

Short-Run and ARDL-Error Correction Models

After the confirmation of the long-run relationship, the next step is to estimate the confirmation of the error correction term, which must be negative in coefficient and statistically significant. This means that divergence from the long-run equilibrium is corrected in the short-run, depending on the speed of adjustment. Since the bounds test conducted showed that long-run or cointegrated relationships between the variables, we proceed to estimate the short-run ARDL-ECM model for the Nigerian banking sector.

Table 5: The ARDL-ECM for Nigeria bank profitability-funding sources model

ARDL Error Correction Regression
 Dependent Variable: D(ROA)
 Selected Model: ARDL (1, 1, 0, 0, 1, 0)
 Sample: 1990 – 2023

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61.6669	6.1379	10.0468	0.0000
D(MMF)	-0.2796	0.3167	-0.8831	0.3863
D(CSF)	-0.1255	0.1544	-0.8129	0.4246
ECT(-1)*	-0.4924	0.1477	-10.1071	0.0000
Adjusted R-Square	0.7687			
Durbin-Watson Stat	2.2083			

Source: CBN Statistical Bulletin 2023

As can be seen in Table 5, the error correction model coefficients in the banking profit-interest rate spread and funding sources model in the Nigerian banking sector showed the supposed negative which, is statistically significant at 1% significance level. The implication of this result is that there is significant error taking place and there is also a correction of the error back to long-run equilibrium in the preceding periods. About 49.24% of error generated in past years was corrected in the current period. Furthermore, the respective values of the adjusted R-squared showed that the changes in capital structure funds and ECT variables determine 76.87% of changes in the banking profit-interest rate spread and funding sources model in the Nigerian banking sector. The Durbin-Watson statistic values, being 2.2083, lying between the acceptable bounds of 1.4 and 2.5, means that the interest rate spread-funding sources model is free of first order serial correlation.

ARDL Long-run Model Estimation

Based on the existence of long-run cointegrating relationships in the afore-stated multivariate models of this study, the study will be estimating the coefficients of the ARDL long-run relationship between the funding sources, interest rate spread and Nigerian banking sector in the first instance, and funding sources, interest rate spread. With regards to the lag specification of the ARDL model, the ARDL modelling procedure has Akaike model selection selected as default.

In the model involving funding sources, interest rate spread and Nigerian banking sector profitability in the Nigerian banking sector, the model’s lag selection criteria based on Akaike model selection are defined as:

Funding sources, interest rate spread and bank profitability - ARDL - (1, 1, 0, 0, 1, 0)

Based on the lag specification of the ARDL lags, the long run model is given as:

$$ROA = -0.8393 * MMF + 0.2061 * IRS - 0.2656 * DF - 0.2486 * CSF - 0.6020 * DRS$$

From the model estimation above, the coefficient of money market funds, deposit funds, capital structure funds and discount rate spread were negative for banking sector profits in Nigeria, while that of interest rate was positive for profitability. This estimation means that as interest rate spread boosted profitability of the Nigerian banks, funding sources and discount rate spread were detrimental to profitability.

The first objective was to find out if deposit funds have a big effect on the long-term profitability of the Nigerian banking sector. The p-value for deposit funds in the bank profitability model was higher than the significance level (0.05). This means that deposit funds do not have statistically significant effects on the profitability of the Nigerian banking sector over the long run, from 1990 to 2023. We accept the null hypothesis that deposit funds do not have a big effect on the long-term profitability of the Nigerian banking sector because the negative coefficient of deposit funds is not significant. The result of no significant effect is different from what Haddaweewa and Flayyihb (2020) found, which was a significant link between deposits and profitability indicators. They found that saving deposits had the biggest effect, followed by time deposits, and finally current

deposits, which had the smallest effect. But the insignificant and negative finding is in line with what Muchiri, Muturi, and Ngumi (2016) found: when looked at alone, short-term debt with long-term debt and retained earnings had an insignificant negative relationship with return on assets. One big problem is the issue of non-performing loans (NPLs), which are loans that are in default or close to default. Even though bank deposits are very important for banks to lend to businesses and people and make money, they are not always able to do so. NPLs can hurt banks' stability and profitability. To fix this problem, the CBN should take steps like making it easier to get back loans and making risk management rules stricter.

Table 6: Effect of Funding Structure on the Profitability of the Nigerian Banking Sector.

Variable	Coefficient	Standard Error	t Statistic	p-value
DF	-0.266*	0.133	-2.000	0.0578
MMF	-0.839***	0.221	-3.801	0.0009
CSF	-0.249**	0.115	-2.171	0.0405
IRS	0.206	0.125	1.650	0.1126
DRS	-0.602**	0.215	-2.804	0.0101

Note. * $p < .10$; ** $p < .05$; *** $p < .01$

The second goal was to find out if money market funding doesn't have a big effect on the long-term profitability of the Nigerian banking sector. The p-value for money market funding in the bank profitability model was less than the significance level. This means that money market funding has statistically significant negative effects on the profitability of the Nigerian banking sector from 1990 to 2023. Because the negative coefficient of money market funding is significant, we can reject the null hypothesis that money market funding does not have a significant effect on the long-term profitability of the Nigerian banking sector. The results of this study are similar to those of Ndugbu and Ojiegbe (2016), who found that money market instruments like treasury bills, commercial papers, and federal government bonds have positive and significant effects on bank performance in Nigeria. They also found that bankers' acceptance has a negative and significant effect on bank performance. Only the big and bad effects of bankers' acceptances agree with what this study found, which is a case of conceptualization. This study only looks at money market instruments that banks use to get money, and it also grouped the money market instruments together instead of looking at each one separately like Ndugbu and Ojiegbe (2016) did.

The third goal was to find out if capital structure funds don't have a big impact on the long-term profitability of the Nigerian banking sector. The p-value for capital structure funds in the bank profitability model for the Nigerian banking sector was less than the significance level. This means that capital structure funds have statistically significant negative effects on the profitability of the Nigerian banking sector from 1990 to 2023. Because the negative coefficient of capital structure funds is significant, we can reject the null hypothesis that these funds do not have a big effect on the long-term profitability of the Nigerian banking sector. The results of this study are in line with what Ogieva and Ogiemudia (2019) found when they used panel data to look at how capital structure affects the performance of multinational companies in Nigeria from 2008 to 2017. They found that capital structure has a big and bad effect on the performance of multinational companies in Nigeria. This also backs up the pecking order theory in the Nigerian banking sector. The big effect agrees with Ogbada, Jones, Nmesirionye, and Ibiam (2021), who found that capital structure variables have a big effect on financial performance (return on assets). It disagrees with Ibrahim (2019) and Assirri and Hebbbar (2021), who both found that capital structure was not important to corporate performance.

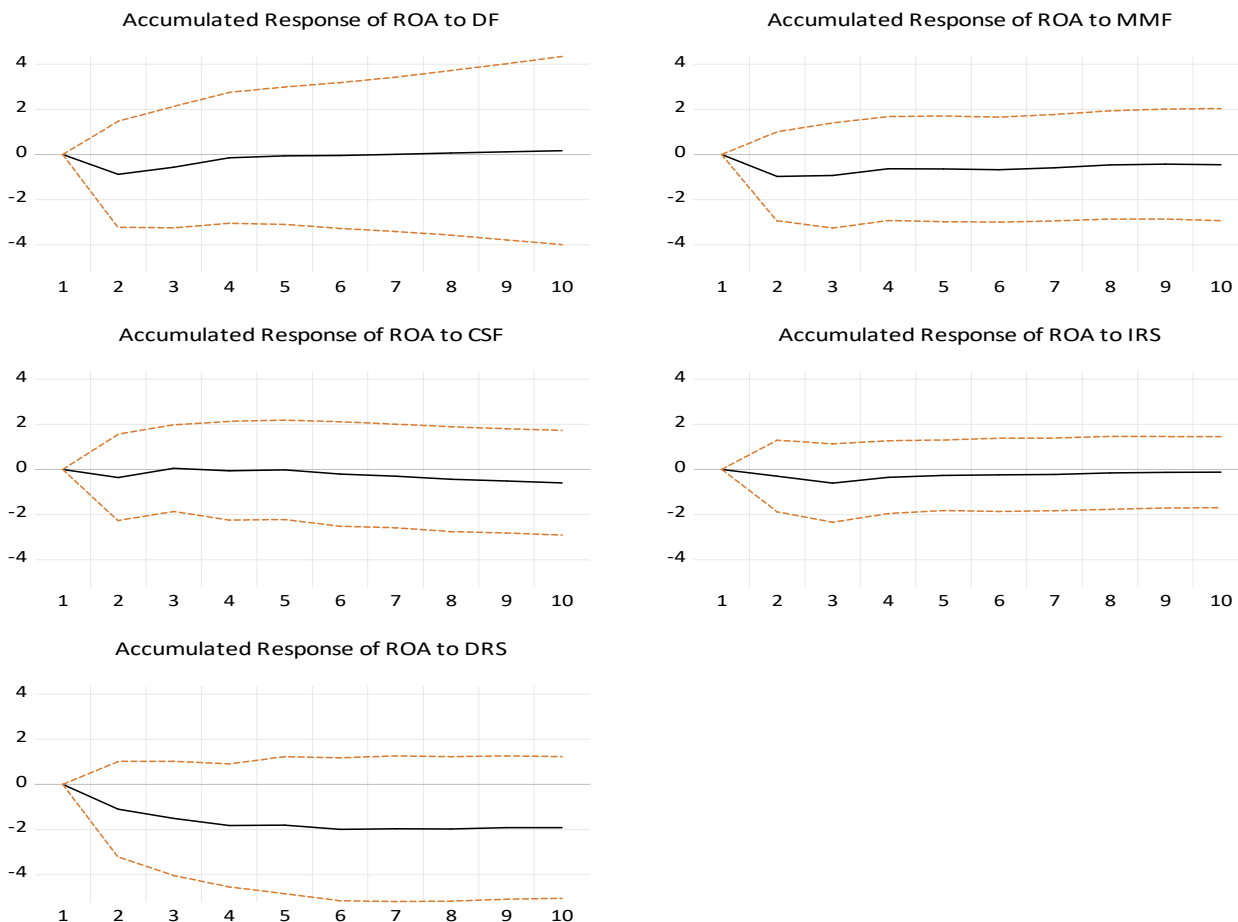
Dynamic Estimation Analysis

Impulse Response Analysis

The impulse response function in this study details how the banking sector profitability in Nigeria responds to sudden shocks in interest rate spreads and funding structure, and also how interest rate spreads respond to sudden changes in bank funding structure or sources. Put differently, it ascertains the magnitude of variation in the Nigerian banking sector performance attributed to a unit change in interest rate spreads and funding sources, and the magnitude of variation in interest rate spreads attributed to a unit change in funding sources.

Figure 1: Impulse Response of the Nigerian banking sector profitability

Accumulated Response to Cholesky One S.D. (d.f. adjusted) Innovations \pm 2 S.E.



Source: Researcher from Central Bank of Nigeria (CBN) Statistical Bulletin 2023

As can be seen in figure 4.7, the Nigerian banking sector profitability responded instantly negative to changes in money market funds, deposit funds, capital structure funds, interest rate spreads. In summary, it can be said that bank profits respond negatively to bank funding structure and interest rate spreads. It can also be observed that the magnitude of response to impulses from discount rate spread was more, followed by money market funds and finally capital funds. This is also a reflection of short-term banks' return on assets is, because it is more affected by short-term funds than longer term funds.

Variance Decomposition Analysis

The variance decomposition was carried out to ascertain which of funding sources and interest rate spreads has much influence or causes more changes to banking profitability and interest rates spreads in the Nigerian banking sector.

Table 7: Variance Decomposition for bank profitability model in Nigeria

Period	S.E.	ROA	DF	MMF	CSF	IRS	DRS
1	5.227465	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	5.590664	89.97511	2.474998	2.987284	0.400735	0.280133	3.881743
3	5.639564	88.48560	2.748886	2.939461	0.911799	0.576865	4.337391
4	5.678670	87.27734	3.239712	3.184683	0.938479	0.778713	4.581074
5	5.699319	87.31575	3.242003	3.161858	0.936671	0.795101	4.548621
6	5.707593	87.13566	3.233098	3.156609	1.040697	0.794129	4.639811
7	5.710433	87.09069	3.238356	3.176564	1.063345	0.794378	4.636666

8	5.714385	86.97749	3.245984	3.217506	1.121464	0.807081	4.630476
9	5.715752	86.94080	3.251537	3.220236	1.137274	0.808824	4.641332
10	5.716738	86.91226	3.259315	3.220888	1.159017	0.808781	4.639743

Cholesky Ordering: ROA DF MMF CSF IRS DRS

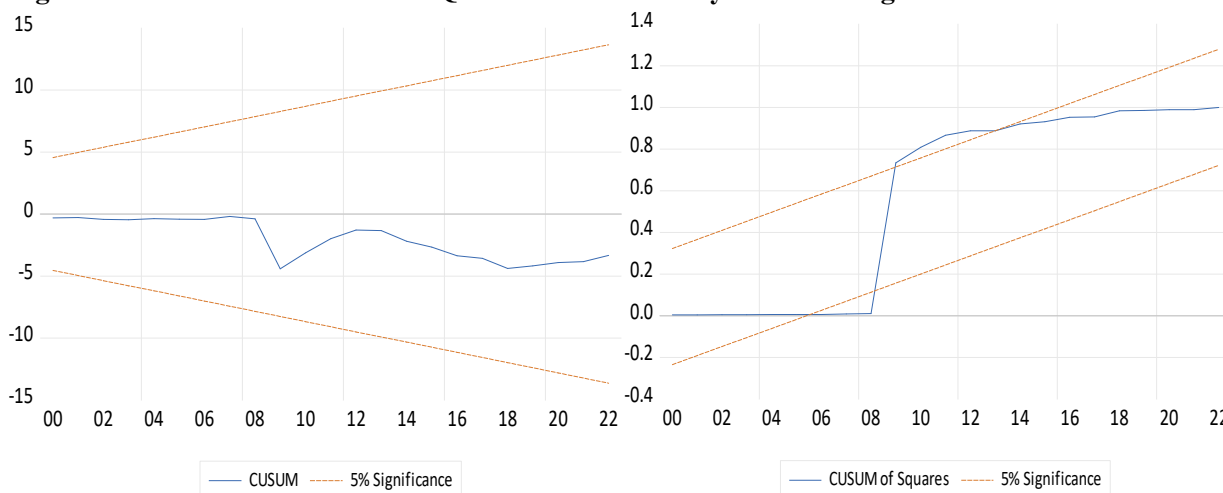
Source: CBN Statistical Bulletin 2023.

The variance decomposition result in Table 4.17 reveals discount rate spread has higher predictive power on banking returns on assets, compared to the predictors. The predictive power was also followed sequentially by those of money market funds and deposit funds respectively. Still, the variation in Nigeria’s banking sector performance was more explained by fluctuation in itself.

Model Stability Tests

The CUSUM and CUSUMQ stability test were used to ascertain the stability of the residuals in the system of models adopted. In this respect, the cumulative sum of Recursive Residuals (CUSUM) and the cumulative sum of squares (CUSUMQ) of Recursive Residuals are used to assess residual stability.

Figure 2: CUSUM and CUSUMQ of Bank Profitability Model in Nigeria



Source: Researcher from Central Bank of Nigeria (CBN) Statistical Bulletin 2023

Since the CUSUM line is between the five percent (5%) lines, it indicates that the stability of the residuals. So, as the CUSUM lie between the 5% significance level, we conclude that the model equation involving Nigerian banking sector profitability. However, there is a variation in the CUSUMSQ plot that swayed out of the 5% bound level. This structural instability is observed between 2006/2007 to 2016. This range of period coincided with the global financial crisis and oil price shock that caused Nigeria to enter into recession.

Diagnostic Tests

To ensure the validity of the estimates of the parsimonious models above, tests to verify the extent of the affirmation or violations of the assumptions of Least Squares estimates (of which the ARDL is part of) were carried out. They include the Breusch-Godfrey Serial Correlation LM, Heteroscedasticity and Jarque-Bera Normality tests. Because the study estimated eight (8) models, eight of these diagnostic tests will be carried out, two (2) each for bank profitability model and interest rate model.

One of the most commonly applied tests for normality is the Jarque-Bera (hereafter JB) test. JB uses the property of a normally distributed random variable that the entire distribution is characterized by the first two moments - the mean and the variance. If the residuals are normally distributed, the histogram should be bell-shaped and the Jarque-Bera statistic would not be significant. This means that the *p*-value(s) of the chi-square distribution should be greater than 0.05 to not reject the null of normality at the 5% level (Brooks, 2008). Since the *p*-value of the Jarque-Bera statistic for the bank profitability model is less than

0.05, we can conclude that the model structure was not normally distributed. Recall that the same model was not stable between 2006 and 2016, it means some macroeconomic disturbance like oil price shocks were responsible for the nonnormality distribution of the model system. On the contrary, for the probability of the Jarque-Bera statistic to greater than 0.05 (i.e., $0.4506 > 0.05$), we conclude that there is no statistical evidence of the presence of no normality in the interest rate spread model.

Table 4.19: Diagnostic tests for bank profitability model in Nigeria

Tests	prob.	Decision
Normality test	0.000	non-normal distribution
Serial Correlation test	0.367	no serial correlation
Heteroskedasticity Test	0.087	homoskedastic

Source: CBN Statistical Bulletin 2023.

Since the p-values of the Breusch-Godfrey Serial Correlation LM test statistics for the bank profitability model is greater than 0.05 (i.e., $0.367 > 0.05$; $0.1397 > 0.05$), we conclude that there is no statistical evidence of the presence of no serial correlation in the bank profitability model. Again, since the p-values of the Breusch-Pagan-Godfrey Heteroskedasticity test statistics for the bank profitability model is greater than 0.05 (i.e., $0.087 > 0.05$), we conclude that there is no statistical evidence of the presence of no heteroskedasticity in the bank profitability and interest rate spread models.

Conclusion and Recommendations

This study examined the effects of funding structure and interest rate spreads on profitability in Nigeria, and the effects of funding structure on interest rate spreads in the Nigerian banking sector using time series data set from 1990 to 2023. The study examined a number of significant interest rate spread and funding component variables that are difficult to neglect when trying to understudy the effects of funding structure and interest rate spreads. These variables include deposit funds, money market funds, capital structure, interest rate spread and discount rate spreads. From the study's findings, it can be concluded that bank funding sources had negative effects on profitability with money market funds and capital structure funds revealing significant negative effects, while deposit funds were not significant but still detrimental to bank profitability in Nigeria.

There are, however, some limitations built into the study's design and scope. The fact that the study only looked at one country's time series data makes it hard to apply the results to other countries or even to other emerging economies. Also, the ARDL method is flexible, but it might not be able to fully capture structural breaks or regime shifts in Nigeria's financial sector over the long sample period. This could make the estimated relationships less stable. Also, the study's focus on aggregated sector-level data might hide differences between banks, like size or ownership structure, which can affect funding strategies and profitability in different ways.

This study's strengths are that it looks at how different parts of the bank funding structure and interest rate spreads affect the profitability of Nigerian banks over a long period of time, from 1990 to 2023. The research used Ho and Saunders' Dealership Model, which is a well-known theoretical framework that explains how banks' liability portfolios, interest rates, and profitability are determined from within. This gave the analysis a strong foundation in microeconomic theory. The Autoregressive Distributed Lag (ARDL) model made the study even stronger because it can work with mixed data integration orders, is good for small samples, and can estimate relationships that last for a short time or a long time. This method allowed the study to get detailed information about how deposit funds, money market funds, capital structure, interest rate spreads, and bank profitability interact with each other in a changing way. This information is very important for policymakers and bank managers in Nigeria.

Even though there are some limitations in the study, the results have important implications, especially the fact that deposit funds and capital structure don't matter much and that money market funds hurt profitability. They say that Nigerian banks' reliance on money market funding may hurt their profits, which means that funding strategies and regulatory frameworks need to be looked at again to make banking operations more stable and profitable.

In line with the findings/conclusion made in this study, the following recommendations are put forward:

1. Given that deposit funds are not a significant determinant of bank profitability, banks can encourage customers to make deposits by offering competitive interest rates on savings

accounts and certificates of deposit. By attracting more deposits, banks can increase their pool of funds available for lending, which in turn generates interest income and boosts profitability. Secondly, banks can focus on building strong relationships with businesses and individuals to attract larger deposit amounts. This can be achieved through personalized customer service, tailored financial solutions, and the provision of convenient banking services. By attracting high-value deposits, banks can improve their liquidity position and reduce their reliance on costly sources of funding, such as borrowing from other financial institutions.

2. Given that money market funds are significant and negative determinant of bank profitability, it is recommended that the regulatory framework be strengthened to ensure transparency and stability within the money market. This involves creating and enforcing regulations that govern the issuance and trading of financial instruments, as well as monitoring the activities of market participants to prevent malpractices. Also, there is a need to promote innovation in financial products and services within the money market. This can involve introducing new instruments that cater to the diverse needs of investors and borrowers, thereby deepening the market.
3. Given that capital structure funds are not significant and negative determinant of bank profitability, it is recommended that available capital funds be allocated to facilitate the expansion and growth strategy banks. With sufficient capital at its disposal, banks can pursue strategic initiatives such as opening new branches, investing in technology infrastructure, and diversifying its product offerings. These endeavours can lead to increased market share and revenue generation, ultimately bolstering the bank's profitability.

References

- Al-Harbi, A. (2019). The determinants of conventional banks profitability in developing and underdeveloped OIC countries. *Journal of Economics, Finance and Administrative Science*, 24 (47), 4-28. <https://doi.org/10.1108/JEFAS-05-2018-0043>
- Anggraeni, A., Hartoyo, S., & Sasongko, H. (2019). The effects of subordinated bonds issued and the bank financial performance towards the stock trading volume activity. *Jurnal Aplikasi Manajemen*, 17(4), 615-624.
- Aremu, M. A., Ekpo, I. C., & Mustapha, A. M. (2013). Determinants of banks' profitability in a developing economy: evidence from Nigerian banking industry. *Interdisciplinary Journal of Contemporary Research in Business*, 4(9), 155-181.
- Assirri, S. A. A., & Hebbbar, C. K. (2021). Capital structure and bank performance of Islamic and commercial in Yemen. *International Journal of Research - GRANTHAALAYAH*, 9(12), 39-49. <https://doi.org/10.29121/granthaalayah.v9.i12.2021.4411>
- Atanda, A.A. and Ajayi, F.O. (2012). Monetary policy and bank performance in Nigeria: A Two-Step Cointegration Approach. *African Journal of Scientific Research*, (1), 462-476
- Bhattarai, B. P. (2020). Factors influencing profitability of insurance companies in Nepal. *International Journal of Management*, 11(9), 8-14. <https://ssrn.com/abstract=3708667>
- Chen, J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research*, 57(12), 1341-1351.
- Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4-5), 387-405.
- Demyana, N., & El Hadidi, A. (2020). Capital structure and firm performance: Empirical evidence from a transition country, 4(2), 481-511. <https://doi.org/10.21608/ALJALEXU.2020.106201>
- Dieu, C. N. T., Dinh, D. D., Thai, B. L., & Thuy, T. N. T. (2019). Capital structure and performance: Empirical evidence from Vietnam. *Journal of Emerging Issues in Economics, Finance and Banking*, 8(1), 2801-2812.
- Donaldson, R., & Parr, L. (1961). *Donaldson. corporate debt capacity: a study of corporate debt policy and the determination of corporate debt capacity*. Harvard Business School, Division of Research, Harvard Univ.
- Ekmekaoglu, E. (2013). Role of financial markets in a global economy and the concept of uncertainty. *International journal of academic research in economics and management sciences*, 2, 199-206.

- El-Chaarani, H., & El-Abiad, Z. (2019). Analysis of capital structure and performance of banking sector in Middle East Countries. *International Journal of Economics and Financial Issues*, 9 (2), 1 – 11. <https://doi.org/10.32479/ijefi.7454>
- Epor, S. O. (2024). Finance and economic development in Brazil: An exposition of policies and economic performance. In *Finance and Economic Development: Post-Cold War Perceptions, Paradigms and Outcomes: A 20 Country Comparisons*. Published by IGI-Global. <https://doi.org/10.4018/979-8-3693-1610-8.ch006>
- Epor, S. O., Yua, H., & Utor, V. (2023). Exploring the asymmetric impacts of inflation on interest rate spread: Evidence from Nigeria with nonlinear ARDL and asymmetric causality. *African Banking and Finance Review Journal*, 7(7), 100-119.
- Gjorgji, G. and Goran, H. (2019). Determinants of liquidity and its relationship with profitability – the case of Macedonian banking sector. *Asian Journal of Economics and Empirical Research*, 6 (1), 85-92. <https://doi.org/10.20448/journal.501.2019.61.85.92>
- Gul, S., & Cho, H. R. (2019). Capital structure and default risk: Evidence from Korean Stock Market. *The Journal of Asian Finance, Economics and Business*, 6, 15-24. <https://doi.org/10.13106/jafeb.2019.vol6.no2.15>
- Haddaweaa, A. H., & Flayyihb, H. H. (2020). The relationship between bank deposits and profitability for commercial banks. *International Journal of Innovation, Creativity and Change*, 13(7), 226 – 234
- Hafiz, U. A., Murtala, G., Rabiou, I. D., & Ladan, S. (2020). Impact of debt capital on performance of listed deposit money banks (DMBS) In Nigeria. *ATBU Journal of Accounting and Finance*, 1(1), 462-473.
- Ibrahim, S. S. (2019). The impacts of capital structure on bank performance: A case of Iraqi Private Banks. *Koya University Journal of Humanities and Social Sciences*, 2(1), 118-123.
- Lestari, R. I. (2021, May 15). *The relationship between debt securities issuance and operational performance: An empirical study of banks in Indonesia*. SSRN. <http://dx.doi.org/10.2139/ssrn.3878152>
- Manurung, A. H. (2015). Effects of bonds issuance on banking performance. *Journal of Applied Finance and Banking*, 5(5), 113-124.
- Miskin, F.S. (2001). The transmission mechanism and the role of asset prices in monetary policy. *National Bureau of Economic Research Working Paper*, No. 8617
- Myers, S. C. & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187–221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
- Mwamtambulo, D. J. and Ntulo, E. W. (2018). Determinants of interest rate spreads in commercial banks: A case of Tanzania. *Global Journal of Management and Business Research Finance*, 18 (6), 11-19.
- Ndirangu, J. M., & Ochiri, G. (2018). Effects of financial structure on performance of listed investment firms in Kenya. *The Strategic Journal of Business and Change Management*, 5(1), 785-798.
- Ndugbu, M. O., Duruechi, A.H., & Ojiegbe, J.N. (2016). Money market instruments and bank performance in Nigeria. *Journal of Economics and Sustainable Development*, 7(10), 95-104.
- Nzau, M. M., Kung'u, J. N., & Onyuma, S. O. (2019). Effect of bond issuance on financial performance of firms listed on Nairobi Securities Exchange. *International Journal of Business and Management Review*, 7(8), 16-25.
- Ogieva, O. F., & Ogiemudia, A. O. (2019). Capital structure and firm performance in Nigeria: Is pecking order theory valid? *Amity Journal of Corporate Governance*, 4(2), 13-26.
- Olaifa, O. I. (2018). The effects of financial decisions on the performance of commercial banks in Nigeria. *European Journal of Business and Management*, 10 (8), 123-128.
- Onehi, D. H., & Epor, O. S. (2024). Lending behaviour in the Nigerian banking sector: the role of Economic activity. *African Banking and Finance Review Journal (ABFRJ)*, 15(15), 285-300.
- Owusu-Antwi, G., Banerjee, R., & Antwi, J. (2017). Interest rate spread on bank profitability: The case of Ghanaian Banks. *Journal of Accounting, Business and Finance Research*, 1(1), 34-45. <https://doi.org/10.20448/2002.11.34.45>.
- Patel, J. (2018). Impact of interest rate spread on profitability of nationalized banks and private banks. *EPRA International Journal of Research and Development*, 3(9), 76-79.
- Petrisia, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia Economics and Finance*, 20, 518-524.

- Pesaran, M.H., Shin, Y., & Smith, R.J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16, 289-326. <http://dx.doi.org/10.1002/jae.616>
- 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.
- Ronoh, W., Naibei, I., & Cheruiyot, P. (2021). Relationship between interest rates spread and financial performance of commercial banks in Bomet County, Kenya. *International Journal of Recent Research in Commerce Economics and Management*, 8(3), 8-15.
- Sabo, B. (2007). An assessment of the determinants of the nigerian banking industry profitability: Using panel evidence from Nigerian commercial banks. *The Information Manager*, 7 (2), 14-20. <https://doi.org/10.4314/tim.v7i2.27197>
- Tanko, U. M., Siyanbola, A. A., Bako, P. M., & Dotun, O. V. (2021). Capital structure and firm financial performance: moderating effect of board financial literacy in nigerian listed non-financial companies. *Journal of Accounting Research, Organization and Economics*, 4(1), 48-66.
- Tripathy, S., & Shaik, A. (2020). Leverage and firm performance: Empirical evidence from Indian food processing industry. *Management Science Letters*, 10, 1233–1240. <https://doi.org/10.5267/j.msl.2019.11.021>
- Ubesie, M. C. (2016). The effect of capital structure on the financial performance of Nigerian quoted conglomerates. *European Journal of accounting, Auditing and Finance research*, 4(6), 61-69.
- Utor, V., Yua, H., & Epor, S.O. (2023). Revisiting the real earnings management and financial performance nexus in Nigeria: A panel ARDL modeling of listed Oil and Gas companies. *UNIZIK Business School (UBS) Journal of Business and Economic Policy*, 1(4), 250 - 264.
- Yua, H., Epor, S. O., Ajekwe, T., & Utor, V. (2024). Influence of firms' characteristics on profitability of banks in Nigeria: Application of panel long-run and short-run analysis. *World Journal of Finance and Investment Research*, 8(2), 19-40.