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## BANKS DIVERSIFICATION AND RETURN ON ASSETS OF DEPOSIT MONEY BANKS IN NIGERIA

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### ABSTRACT

*Bank Diversification and return on assets of deposit money banks in Nigeria for the period 1990-2020 is the focus of this paper. Treasury bills, acquisition of ordinary shares, investments in subsidiaries, and foreign investments outside Nigeria were the explanatory variables and proxies for bank diversification while Return on assets is the dependent variable for all deposit money banks in Nigeria, for the periods under review. In the course of the study, data were obtained from the website of Central Bank of Nigeria Statistical bulletin and annual report of Nigerian Deposit Insurance Corporation (NDIC). The Augmented Dickey Fuller (ADF) test option was used to test for unit roots. The autoregressive distributed lag (ARDL) and Bounds test tools were also used to estimate the short and long run relationships respectively. The study discovered that at short run, ordinary shares, treasury bills, investments in subsidiaries were positively related, while foreign investments outside Nigeria was negative but not significant predictors of return on assets of DMBs at most lag periods. Long run relationship was also observed to exist amid treasury bills, acquisition of ordinary shares, investment in subsidiaries, foreign investments outside Nigeria and return on assets of all deposit money banks in Nigeria for the period 1990- 2020. The study recommended that (1) DMBs should diversify into treasure bills and ordinary share capital in the short run as it would positively influence return on assets positively. (2) DMBs should increase their investments in subsidiaries in order to increase return on assets.*

**Keywords:** Return on assets, diversification, ADRL, treasure bills, ordinary share capital, investments in subsidiaries.

## 1. INTRODUCTION

A critical analysis of banks diversification and return on assets in Nigeria (1990-2020) has become necessary in addressing financial soundness of banks in Nigeria. Nzotta (2004), explained that the strength of a bank depends on the capital funds available and how banks capital can be used to boost public confidence and assures the public that depositor's funds are safe while the strength of a bank is known by its assets. Nisar et'al (2015) had earlier stated that the banking system is the backbone of most nations; hence a stable banking system is a pre-requisite for not only the banking industry but for a prosperous economy. More so, the banking sector is viewed as an alternative source of financing in most developing nations. For sustainable financial stability and soundness, deposit money banks (DMBs) are expected to diversify their assets into different class of portfolios. Stiroh (2006), strongly affirmed that with increased income flow, deposit money banks can diversify their assets to other streams of investment opportunities that would further increase return on assets hence ensuring economic stability. However, there had been continued misconception on how diversification has affected the financial performance in the banking industry.

Bank revenue diversification has become imperative for bank returns due to the increased use of the strategy in recent years. First Bank plc's diversification strategy for instance, focused on restructuring the business within the industry, pursuing business line expansion across strategic business units, continuously implementing systematic international expansion plan, sequencing its growth initiatives across defined metrics, as well as building synergies and cross-selling across the FirstBank Group. First Bank plc pioneered initiatives in international money transfer and electronic banking in the country, serving more than 14 million customer accounts ([www.firstbankplc.com](http://www.firstbankplc.com)). Union Bank of Nigeria Plc, also shows their level of diversification of assets over the years. The bank was principally involved in the provision of banking and related financial services to corporate and individual customers. Such services include granting of loans & advances, acceptance of deposits and money market activities. In creating return on assets, the bank leveraged on technology, to extend credits to the retail segment via its electronic banking platforms ([www.unionbankannualaccounts.com](http://www.unionbankannualaccounts.com)).

Guaranty Trust Bank Plc. was also listed on the London Stock Exchange in July 2007 which made the Bank the first Nigerian Company and African Bank to be listed on the main market of the London Stock Exchange. The bank made an offering of ₦13.165 Billion Fixed Rate Senior Unsecured Non-Convertible Bonds Due 2014, being first tranche under the Bank's ₦200 Billion Debt Issuance Program. In May 2011, the Bank successfully launched a US\$500 million bond - the first non-sovereign benchmark bond offering from sub-Saharan Africa (outside South Africa), to the international community ([www.gtbankannualaccounts.com](http://www.gtbankannualaccounts.com)).

Across the world, and in Brazil, the banking system has undergone drastic changes since the implementation of the Real Plan in 1994. The period 1990 to 1993, according to De paula and Marques (2006), income from floating rate securities accounted for an average of 38.50% of Brazilian banks' total revenues. It was further reported that the banks' revenue portfolio is still treated as a secondary issue, whether in papers devoted to other characteristics of Brazilian banks or in studies that cover a particular group of countries, such as emerging countries. Araujo, Gomes, Guerra and Tabak (2011) found that noninterest income is an important variable to determine bank efficiency.

## 1.2 Statement of the Problem

Available body of knowledge in banking sector has handful of works on bank diversification as it affects return on assets. The findings by Uniamikogbo, Okoye and Arowoshegbe (2020), dwelt on income diversification and performance, the outcome shows that, income diversification has a positive influence on financial performance. The study used only 8 banks for a period of 10 years (2008-2018).

Due to length of time used by the previous study, which creates doubt on the reliability of the outcome, this current study, for a period of thirty years (30) years i.e. 1990-2020 became imperative to ascertain the claims of earlier studies across the world and Nigeria in particular, aimed at filling the identified research gap.

## 1.3 Objectives of the Study

The main objective of the study is to determine the relationship amid bank diversification and return on assets of deposit money banks in Nigeria. Specifically, the study is to:

- I. determine the degree of relationship between Treasury bills and Return on assets,
- II. ascertain the extent of relationship amongst ordinary share capital and Return on assets
- III. determine the extent of relationship between investments in subsidiaries and Return on assets; and
- IV. to establish the relationship amidst foreign investments outside Nigeria and Return on assets of deposit money banks in Nigeria.

## 1.4 Research Questions

The following research questions are hereafter formulated;

- I. What extent of relationship exists between treasury bills and return on assets?
- II. What pattern of relationship exists between ordinary shares capital and return on assets?
- III. To what extent is the relationship between investments in subsidiaries and return on assets of DMB in Nigerian banking industry?
- IV. What extent does foreign investments outside Nigeria influence return on assets of deposit money banks in Nigeria?

## 1.5 Research Hypotheses

Based on the study questions, the following hypotheses are hereafter formulated in their null forms;

- I. there is no significant relationship between treasury bills and return on assets,
- II. significant relationship does not exist between ordinary shares capital and return on assets,
- III. investments in subsidiaries does not significantly influence return on assets,
- IV. there is no significant relationship between foreign investments outside Nigeria and return on assets of deposit money banks in Nigeria.

## 2. REVIEW OF RELATED LITERATURE

Conceptual review, theoretical review and empirical review were treated in this section of the study.

## 2.1 Conceptual Review

### 2.1.1 Bank Diversification:

Foss and Christensen (2001) agreed that diversified firms can create positive spillovers since the value of resources in one industry increases due to investment in another industry. Portfolio theory provides a normative approach to investors on how to take decisions, to invest wealth on assets or securities under risk, were the words of Berger, Hasan and Zhou (2003).

Bank diversification by Neelam (2014) was defined as a combination of broad asset class carefully selected to obtain optimum returns. Contractor, Sumit and Chin (2003), explained that firms derive benefits from sharing tangible resources, technological know-how, vertical integration, coordinated strategies and pooling together negotiating power through bank diversification. Conclusively, firms through diversification across many activities, maximize the exploitation of valuable resources and hence increase their financial performance. Diversification ensures that an investor's portfolio doesn't lean too heavily on one type of investment. Bank Diversification occurs when an investor manages risk by spreading investments across different asset classes. This means investing in a variety of asset classes, such as stock in addition to material assets like real estate, or government bonds. Diversification aims to reduce the variability of bank operations by decreasing the concentration of the sources (deposits) and uses (credit) of funds that generates funds (Berger, Hasan & Zhou, 2010).

Hosna and Manzura (2009) had earlier broken down non-interest yielding activities as activities that either positively or negatively influence returns on assets to include, issuing bank guarantees, letters of credit, import payments, shipping guarantees, advising letters of credit and so on by deposit money banks. The effective management of these non-interest incomes could decrease risk associated with undiversified portfolio. Bank diversification takes place the moment fund managers or investors spread available funds to different categories of investment opportunities. Diversification entails that investments doesn't lean too heavily on any single investment option. Implying therefore, that investing in other categories of investment opportunities, such as shares, real estate, government bonds, private bonds, are expected to increase returns.

## 2.2 Types of bank diversification

**Geographical diversification:** this type of diversification occurs when deposit money banks spread their assets outside their territorial base or different geographical areas. The tactics of diversification can be adopted by large banks alongside its core operations. Smaller banks on the other hand tend to be more concentrated in a particular geographical area, instead of spreading to other locations.

**Diversification by spread of deposits:** Another type of diversification is deposit diversification, according to Rose and Hudgins (2010), deposit diversification encompasses investing bank's funds to divers' categories of securities at different maturity periods. The use of deposits for investment purposes must match the maturity period of the class of security. Short term deposits for short term money market securities, while long term deposits for long term capital market securities.

**Diversification through revenue spread:** Revenue diversification, in the perspective of De - Young and Rice (2004), can be attained by variegating the sources of both interest and non-interest income on the bank's portfolio, which includes commissions, fees, investing on money market instruments and other revenues that are related alongside specialized essence of banks activities. Improving revenue generating points can be achieved via revenue accumulation, (Mercieca & Wolfe 2007).

**Bank diversification to asset categories:** divestment to different asset categories, requires fund managers or investors to allocate available funds beyond a specific type of security or investment opportunity. Also they are required to determine the percentage of fund to distribute to each category of investment option. some examples of securities which investors can diversify into includes real estate, land and buildings, agriculture, solid minerals, shares in quoted public or private companies, debt instruments, commodities, treasury bills, certificates of deposits, livestock, exchange traded funds and so on.

**Diversification on foreign entities:** bank diversification across international boundaries takes place when deposit money banks or investors, invests outside the domestic country of the investor or bank. In most instances, the investments might be unrelated with the business in the domestic country. The significance of diversification across international boundaries is to ensure that the risk in the home country may not be the same risk in the foreign country. (www.investopedia.com). Thus, a bank can still survive as a going concern in spite of any risk, encountered in the domestic country.

### **Advantages of bank Diversification**

(a) It minimizes excessive risk concentration

With bank diversification, the risk of lending would be managed at all stages of credit administration. This is necessary because some loans react at different uncertain market situations. Thus, the meaning of this is that when portfolios are diversified, they can be very strong even if some loans perform badly.

(b) It respond better to changing market situations

Diversified DMBs respond and could survive in unstable market conditions. With uncertainty in the business environment, banks should opt for loans, real estate investments, government bonds, public or private equities and so on that respond positively to various uncertain business environments.

(c) It enables banks to meet their financial/ non financial needs:

Banks diversification enables DMBs to strategically reduce risk tolerance level with the aim of meeting financial and non financial goals. For example, a bank with a low risk tolerance can opt for low-risk, high-yield and high-performing loan products provided by an experienced and reputable loan organization (Triad financial services, 2017).

(d) It helps to preserve capital: through portfolio diversification risk can be minimized. This helps to reduce the volatility of investments and preserve capital.

(e) Helps to leverage on growth opportunities: a well diversified portfolio plan helps organizations to be exposed to different assets in different sectors of an economy and take advantage of the movement of the market.

#### Disadvantages of bank Diversification:

Some disadvantages of bank diversification are outlined below:

- (a) The Management of a pool of portfolios of investments of varying categories is also very expensive, and attracts transaction fees and commissions.
- (b) It could be time consuming.
- (c) Banks with incomplete information and invests in an unrelated class of investment could result to poor returns on investments.

**2.3 Return on Assets:** Return on assets (ROA) according to Kasmir (2016) is the ratio that states, how well assets are used to create the returns of an organization. ROA measures the level of effectiveness of the organizations overall operations. The higher the ratio the better for the organization can use its assets effectively to earn returns. The return to shareholders of a given firm after meeting all expenses and taxes is referred to as ROA (Horne & Wachowicz 2005). Higher Return on assets means better managerial returns. Higher return on assets can be due to financial leverage.  $ROA = \text{Net Profit} / \text{total capital employed}$ .

ROA gives an idea as to how efficient management uses its assets to generate earnings

Return on assets factors in a company's debt while return on equity does not. The return on assets figure gives the investing entity an idea of how effective the entity diversifies its funds on income yielding opportunities. Management's most important job is to make good choices when allocating its resources and the best managers are great capital allocators (investopedia.com).

#### Relationship between Investments in Ordinary Shares and Returns on assets

Some scholars have observed the relationship amid investments in ordinary shares and returns on assets of DMB. Kiyamaza and Berument (2003) looked at the relationship between acquisition of ordinary shares capital and returns on assets; they submitted that high levels of uncertainty at securities market are likely to result into low trading, grossly explained by unwillingness of firms to commit their funds into investments. This they said is likely to have a ripple effect on the indicators of firm performance such as profits, ROA and ROI.

#### Investments in subsidiaries and returns on assets

Investments in Subsidiaries, in the words of Anderson and Anders (2002) plays a strategic role by influencing returns on assets. The more the strategic relationship amid subsidiary and parent, the more likely the subsidiary will receive support and resources from the parent company to attain high returns on assets.

#### Foreign Investments and Return on assets

Domestic Investors can derive the gains of diversification by investing in foreign securities in view of the fact that, they tend to be less closely correlated with domestic securities. For instance, economic environmental threats distressing the Nigerian economy may not affect another economy in the same way. Hence, possessing another countries stocks gives an investor defense against losses in periods of economic downturn in the home country (www.investopedia.com).

Capar and Kotabe (2013) submitted that foreign diversification is a growth strategy that has considerable influence on the firm's returns on assets.



## 2.4 Theoretical Review

**Resource Based View (RBV) Theory:** The theory on resource based view could be traced to the work of Penrose (1959). The theory is based on the assumption that with deliberate managerial efforts, organizations can achieve sustainable competitive edge over its competitors thereby maximizing returns. Thus, the main aim of the theory lies on the fact that organizations use productive resources to exploit productive opportunities, to attain growth in the organization.

In the words of Contractor, Sumit and Chin (1952) firms enjoy benefits by sharing resources such as vertical integration, technological know-how, pooling together negotiating powers and so on. The theory concluded that organizations diversification strategy across business activities maximize returns by exploiting valuable resources at their disposal.

### **Modern Portfolio Theory**

The idea of Modern Portfolio Theory as propounded by Harry Markowitz (2002) suggested that institutions can construct portfolios that would give the highest expected returns. The theory, tries to maximize profits in a given portfolio risk or equally reduce the risk in an expected returns; it could be attained by critically selecting various investment options available in the market (Fabozzi & Gupta, 2002).

### **Agency Cost Theory**

Agency Cost theory attempts to explain the relationship between two parties; the principal and the agent in a given business transaction, it is often referred to as agency dilemma. The dilemma occurs where the agent makes decision or acts on behalf of the principal in a way and manner that contradicts the interest of the principal, thus creating a gap between goals and desires between agent and principal in an organization.

Diversifying the resources of an organization by directors according to Owies (2012) is for their own interest. The study further asserted that managers diversify organizations resources to increase their power and prestige, boost their own compensation package, make themselves more secure, by investing in businesses which would require their skills with the view of reducing their own employment risk. Another author, Lindgren (2005) strengthened the position of Owies (2012), by stating that diversification has no intension for maximization of value and increasing performance.

### **Capital Market Theory:**

The capital market theory as postulated by Markowitz explains how rational investors should build efficient portfolios. The capital market theory shows the relationship between rates of returns which investors seek and likewise the inherent risk associated with it. The investors who are rational would seek to invest in financial assets with high returns. The capital market theory agrees as a proposition, when valuing financial assets describing, how different assets need to be priced in the capital market. It also describes and evaluates the advancement of capital and financial market over a certain period of time.

## 2.5 Empirical Review

Stiroh (2004) looked at the potential benefit of diversification for US banks engaged in non-interest activities, for the period 1984-2001, the results shows that net interest income and noninterest income which is relatively more volatile and correlated with returns.

The empirical study of Acharya and Saunders (2006) also comes to focus. The researchers studied on the impact of loan portfolio diversification on returns on assets of Italian banks. The study made use of Herfindahl-Hirschman Index (HHI) as a measure of loan portfolio diversification across different industries and sectors. The result indicates that diversification does not lead to increased returns; neither does it lead to the safety and sound health of the bank. It was also noted that banks with high credit risk in their loan portfolio experienced poor bank returns via portfolio diversification.

Olu (2009) in his study on impact of diversification and returns on equity of firms, the researcher used regression analysis to estimate the equation. The study indicated a correlation coefficient representing a strong positive relationship between geographical diversification and firms returns.

The study by Saoussen and Dominique (2011) examined ‘shift into non-interest based activities of banks and financial performance of banks in East Asia’, for the period 1997-2007. A total of 714 banks were sampled. The study used the basic Herfindahl-type approach for the analysis. The result of the study showed that diversification gains are more than offset the cost of increased exposure to the non-interest income, specifically by the trading income volatility.

Sibel and Ihsan (2012) conducted a study on Banks Diversification and its effect on financial performance in Turkey. Regression analysis was used to estimate the equation; the result indicates that geographical diversification increases banks returns.

In their investigation Turkmen and Yigit (2012) looked at sectoral and geographical credit diversification on the performance of Turkish Banks, for the period 2007-2011. Forty (40) Turkish banks were used as the sample size. The study adopted Herfindahl-Hirschman Index as tool of analysis. The outcome of the study showed negative relationship amid sectoral and geographical diversification and return on equity. The researchers argued that the negative correlation is related to increase in cost of diversification, which offsets the benefits of thereof.

Iqbal, Hameed and Qadeer (2012) researched on the impact of diversification on firms’ performance in Pakistan for the period 2005-2009. The study used a sample of forty (40) companies in Pakistan and relied on secondary data for the study. The result showed that positive relationship was not found amid diversification and firms’ performance.

The impact of bank size and funding risk on bank stability was examined by Michael (2015) in Ghana. The findings of the study suggest a linear relationship amid size of rural banks and stability of the banks in Ghana. Implying however that, an increase in the size of a rural bank will cause a corresponding increase in bank stability, it also revealed that the risk of funding, impacts positively on bank stability in Ghana.

From the work of Yan, Talavera and Fahretdinova (2016), they examined the effect of product diversification on profitability of banks in Azerbaijan. The study used data for six different types of loans and four types of deposits. The result of the study showed a negative relationship amid loan-based portfolio diversification and bank return on equity. It was also revealed that deposit-based diversification had a positive correlation with return on equity of the banks in Azerbaijan.



In the work of Makhoha, Namusonge and Sakwa (2016), the researchers conducted a study on bank diversification and financial performance of commercial banks in Kenya. The researchers used primary data and administered questionnaires and interviewed 133 bank managers randomly and 43 commercial banks. The study concluded that portfolio diversification positively relates with financial performance and is a significant predictor of the movement of financial performance of commercial banks in Kenya.

Studies by Saunders, Schmid, and Walter (2016) on diversification of banks across non-traditional interest generating businesses and bank profitability for the period 2002-2013. A sample of 10,341 US banks was examined, using multiple regression technique to estimate the equation. The researchers discovered that a higher ratio of non-interest income to interest income associated with deposit-taking and lending to retail and commercial clients was related to greater returns on assets and overall performance.

Non-interest income and profitability of Indian banks was studied by Ahamed (2017) for the period 2006-2015. A total of 16 banks were studied using multiple regression analysis to estimate the equation. The findings of the study showed that higher share of non-interest income yields higher profits when banks are involved in more trading activities. The results indicate that private foreign banks perform better, compared to public sector and private domestic banks.

Gerald (2018) discovered in his study on Effects of Portfolio Diversification on financial performance of commercial Banks in Kenya. Forty (40) Commercial Banks in Nairobi, Kenya, were analyzed for the period 2013-2017. Descriptive and regression analysis were adopted as the tool of analysis. The result shows a strong positive relationship amid portfolio diversification and Performance of commercial banks in Nairobi Kenya for the period reviewed. A weak positive correlation was also found between bank size and commercial banks performance in Nairobi, Kenya.

The research by Ammar and Boughrara (2019) may not be different from Saoussen and Dominique (2011). They considered the effect of revenue diversification on bank performance from 1990 - 2011 in Middle East and North African countries. A sample size of 275 banks was used. The researchers used Generalized Method of Moments (GMM) technique to estimate the equation. The result of the study showed that diversification improves bank returns. They also asserted that trading-generating business lines contribute to profitability and stability.

### **3.0 METHODOLOGY**

The section reveals how the data was collected, designed, model specified, and preliminary tests conducted.

**3.1 Research Design:** The design is quantitative, and the type of quantitative design is correlation design meant to determine the relationship between the variables; bank diversification by DMBs and returns on assets. The study identified four proxies for bank diversification; treasury bills, ordinary shares capital, investment in subsidiaries, foreign investments outside Nigeria as explanatory variable while return on asset is dependent variable.

**3.2 Data Collection:** data for this study were basically sourced from the website of the banking supervision department of central bank of Nigeria (CBN) statistical bulletin and annual report of NDIC obtained from their website, from 1990 to 2020.

**3.3 Model Specification:** A mathematical expression used to measure the economic relationship between variables (dependent and independent variables). In this case we specify a functional and econometric models for the dependent and independent variables of the study.

$$ROA = f(TB, OS, INVS, FION, \dots) \dots \dots \dots (1)$$

Assuming a linear relationship amongst the variables, the econometric relationship of the functional form is written as follows:

$$\ln ROA = \beta_0 + \beta_1 \ln OS + \beta_2 \ln TB + \beta_3 \ln INVS + \beta_4 \ln FION + U \dots \dots \dots (2)$$

Where:

ROA= Return on assets

Ln ROA= Natural log of return on assets

TB= Treasury bills

LnTB=natural log of Treasury bills

OS= Ordinary shares capital

LnOS= natural log of ordinary shares capital

INVS=Investments in subsidiaries

LnINVS= natural log of investments in subsidiaries

FION= Foreign Investments held outside Nigeria

LnFION= natural log of Foreign balances held outside Nigeria

U= stochastic error term

B<sub>0</sub>, = constant

b<sub>1</sub>, b<sub>2</sub>, b<sub>3</sub>, b<sub>4</sub>, = coefficients and are the parameters to be estimated

### 3.4 Data Analysis Technique

This study adopted the econometric statistical tool to empirically analyze the data. This technique is used as the model specified the relationship between two variables (dependent and independent). Frisch and Bjerkholt (1995) had submitted that econometric tools aim to give empirical content to economic relations for testing economic theories, forecasting, decision making and for policy evaluation. The study also used the autoregressive distributed lag and bounds test technique to analyze the data.

The data type of this study which is a time series data were analyzed using the econometric statistical tool. The e-views 10 version will be used as the software to run the regression analysis to estimate the equation.

## 4. DATA ANALYSIS AND INTERPRETATION OF RESULTS

### 4.1 Test For Stationarity (Unit Root Test)

The Augmented Dickey-Fuller test statistic was chosen to test for stationarity of the data. The following results were obtained from e-views 10 version.

Table 1, results of the Augmented Dickey-Fuller Unit Root test:

VARIABLES	ADF TEST STATISTIC AT		CRITICAL VALUES	ORDER OF INTEGRATION
	LEVEL	1 <sup>ST</sup> DIFF		
LnROA	-4.098334		-3.699871 -2.976263 -2.627420	1 (0)
LnTB	- 3.301513(pro.0.0249		-3.699871 -2.976263 -2.627420	1 (0)
LnOS		-6.487025	-3.711457 -2.981038 -2.629906	1 (1)
LnINVS		-8.120116	-3.711457 -2.981038 -2.629906	1(1)
LnFION		-9.624682	-3.689194 -2.971853 -2.625121	1(1)

(Source: Researchers' compilation from e-views 10 output)

The test result shows the order of stationarity (unit root) of the dependent and independent variables. While ROA and TB were stationary at level 1(0), OS, INVS and FION were stationary at first difference 1(1). This implies that the regression equation would be estimated using Auto Regressive Distributed Lag (ARDL), due to the mixed order of integration.

## 4.2 Interpretation of Result

### 4.2.1 Auto regressive distributed lag (ARDL) test result

The table below shows the test result obtained from the e-views 10 software indicating the short run relationship of the variables.

Table 2 showing short run ARDL result

Dependent Variable: LROA				
Method: ARDL				
Date: 02/20/23 Time: 21:52				
Sample (adjusted): 1995 2019				
Included observations: 22 after adjustments				
Maximum dependent lags: 2 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (3 lags, automatic): LOS LTB LINVS LFION				
Fixed regressors: C				
Number of models evaluated: 512				
Selected Model: ARDL(2, 3, 3, 3, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LROA(-1)	-0.624392	0.299192	-2.086930	0.0913
LROA(-2)	-0.395793	0.240111	-1.648373	0.1602
LOS	1.125476	0.320850	3.507792	0.0171
LOS(-1)	0.092603	0.325847	0.284191	0.7877
LOS(-2)	0.214211	0.282567	0.758092	0.4826
LOS(-3)	-0.906450	0.364039	-2.489981	0.0552
LTB	0.887483	0.450088	1.971801	0.1057
LTB(-1)	0.458677	0.379056	1.210051	0.2803
LTB(-2)	-0.882068	0.346108	-2.548535	0.0514
LTB(-3)	0.539611	0.400732	1.346563	0.2359
LINVS	-1.415942	0.777031	-1.822247	0.1280
LINVS(-1)	0.254886	0.615300	0.414248	0.6959
LINVS(-2)	-0.569227	0.574594	-0.990659	0.3673
LINVS(-3)	1.928441	0.581865	3.314241	0.0211
LFION	-0.888285	0.818527	-1.085224	0.3274
LFION(-1)	-0.896343	0.582936	-1.537634	0.1847
C	4.657833	4.487224	1.038021	0.3468
R-squared	0.950399	Mean dependent var		0.338046
Adjusted R-squared	0.791677	S.D. dependent var		1.028206
S.E. of regression	0.469298	Akaike info criterion		1.388693
Sum squared resid	1.101204	Schwarz criterion		2.231772
Log likelihood	1.724372	Hannan-Quinn criter.		1.587297
F-statistic	5.987814	Durbin-Watson stat		2.184327
Prob(F-statistic)	0.028873			
*Note: p-values and any subsequent tests do not account for model				

(Source: e-views 10 output)

### 4.3 Interpretation of Results

A look at table 2 reveals R-squared at 0.950399 while the adjusted R-squared shows a percentage of 0.791677. This implies that the predictor or independent variables account for 95% changes in the return on assets of DMBs in Nigeria, thus the variables, are good enough to predict the direction of the dependent variable. Thus TB, OS, INVS, and FION are best fits to predict or influence the direction of return on assets of DMBs in Nigeria for the period studied.

At lags 1 and 2, the result shows that diversifying into ordinary shares capital has a positive relationship with return on assets with 0.092603, and 0.214211 respectively. Thus a 1% increase in acquisition of ordinary shares capital will lead to 0.092603 and 0.214211 increase in return on assets. At same lag periods, the probability values are all greater than the 5% critical level, implying that diversification into ordinary shares capital by DMBs does not significantly predict the movement of return on assets at those lags periods. Thus the null hypothesis is accepted at the short run period. Hence ordinary share capital does not significantly influence return on assets of deposit money banks in Nigeria. Note however that at lag 3, the result showed that bank diversification into ordinary shares capital can influence the movement of return on assets.

At lags 1 and 3, the result shows that diversification through treasure bills has positive relationship with return on assets with 0.458677, and 0.539611. Thus a 1% increase in treasure bills leads to 0.458677 and 0.539611, increase in return on assets respectively, at those lag periods. At lag 2 however, the result revealed negative correlation with return on assets with -0.882068, thus a 1% increase in treasure bills leads to -0.882068 decrease in return on assets. The probability values however, do not indicate significant relationship as the values are all greater than the critical values. The short run period does not show significant relationship between the variables. Therefore, the null hypothesis is accepted at 5% level of significance.

At lags 1 and 3, the result shows that investments in subsidiaries by DMBs has a positive relationship with return on assets with 0.254886 and 1.928441 respectively. 1% increase in investment in subsidiary leads to 0.254886 and 1.928441 increase in return on assets. At lag 2, a negative relationship was observed at -0.569227. Thus a 1% increase in investments in subsidiaries leads to decrease in return on assets by -0.569227. No significant relationship was found as the probability values are all greater than the critical value, except at lag 3. We conclude that the null hypothesis is accepted.

At lags 1 and 2 foreign Investments outside Nigeria by DMBs are seen to be negatively related to returns on assets. The results showed -0.888285 and -0.896343 in those lag periods respectively. The result so far suggests that a 1% increase in FION leads to a decrease in return on assets by -0.888285 and -0.896343 of DMBs in Nigeria. Their probability values are all greater than the critical value of 5%. Thus we conclude that FION does not significantly predict the direction of return on assets of DMBs in Nigeria. The null hypothesis is accepted.

### 4.3.2 Long Run Bounds Test Result

Table 3: long run results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	8.28557	5%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	22		Finite Sample: n=35	
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532

(Source: e-views 10 ARDL output)

The bounds test result as shown in table 3 revealed an F –statistic value of 8.285575 which is greater than the upper bound of 3.49 at 5% level of significance. The null hypothesis is rejected at 5% level, there is long run relationship between return on assets and all the independent variables; Treasury bills, ordinary shares capital, investment in subsidiaries, and foreign investments outside Nigeria for the period studied.

### 4.3.3 Autocorrelation-Durbin Watson

The result of the Durbin Watson statistic showed 2.184327 this means that there is no presence of autocorrelation in the data. Thus, the model satisfies the global criteria for the test of the presence of autocorrelation as one of the regression assumptions.



### 4.3.4 Granger Causality Test Result

Table 4 showing granger causality.

Pairwise Granger Causality Tests			
Date: 02/20/23 Time: 21:50			
Sample: 1990 2019			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
LOS does not Granger Cause LROA	23	2.27153	0.1319
LROA does not Granger Cause LOS		0.58912	0.5652
INVS does not Granger Cause LROA	25	1.02572	0.3766
LROA does not Granger Cause INVS		1.97197	0.1653
LFION does not Granger Cause LROA	25	1.84011	0.1847
LROA does not Granger Cause LFION		1.09594	0.3535
INVS does not Granger Cause LOS	26	2.18131	0.1378
LOS does not Granger Cause INVS		3.14881	0.0637
LFION does not Granger Cause LOS	26	7.49699	0.0035
LOS does not Granger Cause LFION		0.60396	0.5559
INVS does not Granger Cause LTB	28	1.20645	0.3175
LTB does not Granger Cause INVS		1.79958	0.1879
LFION does not Granger Cause LTB	28	6.96309	0.0043
LTB does not Granger Cause LFION		7.74639	0.0027

(Source: e-views 10 output)

The granger causality results above shows bi-directional relationship between foreign investments outside Nigeria and ordinary shares capital at 0.0035 and 0.5559 respectively. FION also granger causes TB while TB also granger causes FION at 0.0043 and 0.0027 respectively. Causality was not found amongst ROA and OS and INVS.

#### 4.4. Discussion of Findings

We have identified that banks diversification into ordinary shares capital, treasure bills, investments in subsidiaries, and foreign investments outside Nigeria all jointly predict the movement of return on assets in Nigeria. At short run period, positive relationship was found between banks diversification into treasury bills, ordinary shares, and investments in subsidiary, and return on asset, at two lag periods. This result aligns with Pisedtasalasai and Edirisuriya (2020), Gerald (2018). The result also shows that on most lag periods diversification via the explanatory variables does not significantly predict return on assets in the short run period. This result points to the Modern portfolio theory as propounded by Harry Markowitz where he suggested that institutions should construct portfolios that would give the highest expected returns at a managerial risk level. This can be achieved by carefully selecting proportion of various investments. So DMBs should select short term securities that

would yield highest level of returns on investments at short run period in order to meet liquidity needs.

With the observed positive relationship between acquisition of ordinary shares, treasure bills, investments in subsidiaries, and return on assets, moving in same direction, shows that banks can diversify to earn returns at short run period. Although those variables are not significant predictors of return on assets at the short run period this position was also observed in Gönenç, and Kılıçhan (2004), Hayden, Porath and Natalja (2006).

This result according to the agency theory describes the differences between goals and desires of principal and agent. According to Owies (2012), managers diversify to maximize their own benefits even at the expense of shareholder's interest; diversify to increase their own power and prestige, to boost their own compensation, to make themselves more secure by investing in projects that require their specific skills or to reduce their own employment risk (risk of losing their job or professional reputation). Lindgren (2005) suggested that the agency view on diversification has no motive for value maximization and increasing profits. This might have accounted for the non significant influence of all the predictor variables to return on assets.

The results of the test revealed long run relationship between all the explanatory variables and the dependent variable. It showed an f-statistic value which is higher than the upper bound at 5% level of significance. So we are confident that at long run, diversification through ordinary share capital, treasure bills, investments in subsidiaries and foreign balances held outside Nigeria would increase return on assets of DMBs in Nigeria.

The granger causality results above show bi-directionally, foreign investments outside Nigeria granger causes ordinary shares capital at 0.0035 and 0.5559 respectively. FION also granger causes TB while TB also granger causes FION at 0.0043 and 0.0027 respectively. Causality was not found amid ROA and OS and INVS.

## **5. SUMMARY CONCLUSION AND RECOMMENDATIONS**

### **5.1 Summary**

This study on banks diversification and return on assets of deposit money banks has shown that banks diversification has positive and negative relationship with returns on assets at some lag periods of the study especially at short run. It also revealed that long run relationship exist amid, return on assets and ordinary shares capital, treasure bills, investments in subsidiary and foreign investments outside Nigeria. It reaffirms the extent to which the strategy of bank diversification can mitigate against risk experienced by DMBs and ensure financial survival and stability of an emerging economy..

### **5.2. Conclusion**

Conclusively, the study has once again re-awaken DMBs in Nigeria to invest in assets that would give positive returns on assets in order to attain the overall desires of all stakeholders in the banking industry in Nigeria.

### **5.3 Recommendations**

(1) Deposit money banks in Nigeria are encouraged to diversify into investments in subsidiaries locally.

- (2) Banks should reduce its foreign investments outside Nigeria due to unfamiliar regulations and business policies especially at the short run period.
- (3) Banks are also encouraged to diversify into treasury bills, acquisition of ordinary shares in quoted companies, investments in subsidiaries and investments in foreign assets with the view to increasing returns on assets at the long run period.
- (4) The Government through the Central Bank of Nigeria should implement monetary policies that would strengthen banks diversification through effective supervision and regulation.

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