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EFFECT OF INVESTMENT SECURITIES ON THE FINANCIAL PERFORMANCE OF BANKING BUSINESS IN NIGERIA

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Abstract

Although, popular in the execution of banking business, investment securities and its effect on banks performance is not so popular among past empirical studies. Hence, this study explores the effect of investment securities on the financial performance of banking business in Nigeria for the period 2010 to 2020. Specifically, this study aims to evaluate the effect of investment securities on earnings per share, return on assets, and return on equity of deposit money banks (DMBs) in Nigeria. The secondary data from the published financial statements of selected DMBs in Nigeria were analyzed using Panel Autoregressive Distributed Lag (P-ARDL) technique. Three models were estimated in this study with each having earnings per share, return on assets and return on equity, respectively, as their dependent variable while investment securities, loan and advances to customers, and bank size constitute the explanatory variables for each of the models. This study establishes the existence of a positive and significant correlation between investment securities and each of earnings per share and return on assets of banks unlike a negative and significant correlation which exists between return on equity and investment securities of banks in Nigeria. Moreover, investment securities have long-run negative but non-significant effect on earnings

per share of banks in Nigeria. However, in the short-run, investment securities' effect on earnings per share of banks is negative but statistically significant. Also, investment securities have positive but non-significant effect return on assets of banks in both long-run and short-run. Furthermore, investment securities have negative and significant effect on return on equity of banks in Nigeria in both long-run and short-run. The study concludes that investment securities negatively affect the financial performance of banking business of deposit money banks in Nigeria. Therefore, there is a need for banks' management to diversity their investment portfolios such that less amount is committed to unprofitable investment securities whose returns are easily eroded by market risks.

Keywords: *Investment Securities, Financial Assets, Deposit Money Banks, Financial Performance, Banking Business, Nigeria.*

Introduction

In banking business, banks are traditionally involved in financial intermediation by mobilizing savings from surplus unit and pooling the surplus funds together for onward extension of same to the borrowers or deficit unit of the economy for trading and investment purposes. Aside these two functions of deposit mobilization and credit extension services, banks are allowed to go into some permissible investment outlets for the purpose of enhancing their revenue base, and compliance with certain statutory requirements like liquidity as well as satisfying other stakeholders. One of such investment is the investment securities- crops of investment options like equity and debt instruments held not for trading purpose but for the purpose of earning returns on investment therefrom.

There are different sources of funds generation for banks, which include those from depositors, debt holders and equity holders and these funds are allocated to different investment portfolios like bonds, treasury bills, currencies, pension, real estate, insurance, commodities, loan, cash reserves, mortgages, mutual and hedge funds, and others (Salman et al., 2020). Banks are not charities and therefore whatever the nature of activities and investments they go into; there is the objective of profit maximization and or wealth maximization behind their minds. This implies that investment securities are normally held by deposit money banks in anticipation of returns, which could either be income or capital appreciation or a hybrid of both. Ultimately, these investments are expected to enhance the performance of banking business, financially and non-financially. The extent to which a firm attains its set goals and objectives could be regarded as its performance and the performance could either be financial or non-financial. It is

non-financial performance when it cannot be expressed in monetary terms but when performance can be quantified in monetary terms, it is said to be financial performance. Some of the dimensions of financial performance include profitability, wealth maximization or earnings growth, liquidity, among others (Charles & Uford, 2023).

According to Uford (2017) the commitment of banks resources into investment securities should normally lead to capital appreciation for the banks through the returns therefrom. Thus, investment securities as part of the assets of banks should be a blessing to the banks and the entire stakeholders. However, the mere acquisition of investment does automatically confer the benefits therefrom on the investors. This may not be unconnected with certain factors like market risk, price risk, institutional factors, managerial ineptitude and others forces which could undermine the performance of the investment, particularly investment securities in relation to its impact on the financial fortune of the investing banks. Empirically, past studies have provided some evidence on the effect of fixed assets (Okobo and Ikpor (2017); portfolio diversification (Makokha et al (2016)); asset diversification (Mutega (2016)); diversification strategy (Obaro et al (2022)); portfolio management (Obiora and Ujam (2021), Adaramola and Ogunsakin (2020)); income diversification (Uniamikogboe et al (2021)); investment portfolio (Salman et al. (2020)); investment diversification (Hailu and Tassew (2018); and investment generally (Hussein (2017), Nisar et al (2015)) on the performance of banks. The very close past empiric to this current study carried in Nigeria by Salman et al (2020) on the relationship between the investment portfolio and banking financial performance, provided evidence on failed to consider investment securities, specifically, in the investment portfolio examined. To the best of the researchers' knowledge there is no known study that have singled-out investment securities for empirical testing of its effect on banks performance, particularly in a developing country like Nigeria.

Therefore, this study aims to examine the effect of investment securities on the financial performance of banking business of deposit money banks in Nigeria. The three specific objectives of this study are: to examine the effect of investment securities on earnings per share (EPS) of deposit money banks in Nigeria; to investigate the effect of investment securities on return on assets (ROA) of deposit money banks in Nigeria; and to investigate the effect of investment securities on return on equity (ROE) of deposit money banks in Nigeria.

Literature Review

Conceptual Review

Financial Performance

Financial performance has been described as the ability of a frim to leverage operational and investment decisions and strategies to achieve financial stability

(Salman et al., 2020). The quantitative and financial measures of liquidity, profitability, solvency, stability, growth and others are the lenses through which the financial performance of a typical firm (like bank) are examined. Earning and returns of banks are the focus of this study when examining the dimension of financial performance of the banks. Thus, in this study, earnings per share (EPS) relates to banks earnings and both return on assets (ROA), and return on equity (ROE) are the measures relating to profitability of banks examined.

Earnings per share is the unit of return earned from the net profit of a firm by shareholders per a unit of ordinary share held in the firm after taking care of fixed income securities holders' needs Earnings per share as a measure that relates to earnings management, and wealth maximization is normally computed as the ratio of net profit to number of ordinary shares in issue and ranking for dividend. Also, return on asset as another indicator of financial performance, is a measure of overall efficiency of the management in the management of the total assets of the firm in relation to which the asset can generate returns. Return on assets is a return from net income per a monetary value of asset owned by the firm. It is mathematically computed as net profit divided by total assets. Return on equity as the third measure of financial performance examined in this study is an amount of net profit per a unit of shareholders' fund or equity of a firm. It tells on how the shareholders' funds are used in the generation of the net profit of the firms and it is the quotient of net profit to shareholders' equity.

Banking Business

Banking business is the art, science and management of money and near-money and its equivalents via financial intermediation. According to Section 5 of Banks and Other Financial Institutions Act [BOFIA] (2020), banking business involves the acceptance of deposits from the general public by a person/entity as a feature of a business or the solicitation for deposits by any means; or the receipt of money as deposits which is limited to fixed amounts, or for which certificates or other instruments are issued in respect of such amounts.

Generally, the services of banks geared towards profit maximization and or wealth maximization could be regarded as banking business. Thus, deposit mobilization, extension of credit facilities, provision of funds' transfers facilities, credit creation, finance of international trade, safe keeping of valuables, brokerage services, agency services, provision of foreign exchange facilities, funds and investment management, provision of business status reports and references, business advisory services, considered as services rendered by commercial banks (Adekanye, 2010; Uford & Joseph, 2019) can be considered banking business.

Investment Securities

Investment generally refers to the acquisition of capital assets for the purpose of income generation or and capital appreciation over a time horizon extending into the future. To Balfoussia and Gibson (2016), investment is additions to fixed assets over the accounting period. Therefore, investment securities as one of the investment outlets for banks refers to financial assets like equities or fixed-income (debt) securities that are invested in for the purpose of holding it for investment rather for trading. Equity instruments are financial contracts evidencing a residual interest in the issuer‘s net assets but debt instruments do not give holders right of residual ownership of net assets of the issuer but rather it creates a contractual relationship of a debtor and creditor between the issuer and the investor respectively. Ordinary shares, preferences shares, time deposits, bonds, debentures, treasury bills, commercial papers, bankers‘ acceptances, treasury certificates, federal government development stocks are examples of investment securities once they are held for investment purpose and not for day-to-day trading.

Theoretical Review

Reviewed in this study are two relevant theories, namely, the Modern Portfolio Theory and Neoclassical Theory of Investment.

Modern Portfolio Theory

Modern Portfolio Theory (MPT) as propounded by Markowitz (1952) is an investment theory which constitutes a framework or a guideline for investment or portfolio selection and diversification as well as portfolio construction with emphasis efficient portfolio where there is returns maximization at the lowest risk possible or risk minimization at the maximum return possible. MPT attempts via proper portfolio construction (asset-mix selection or securities selection) and diversification, to maximize portfolio expected return for a given level of portfolio risk, or minimize risk for a given level of expected return. Based on mean-variance optimization MPT as postulated by Markowitz (1952), expresses a rule which implies that the investors diversify their funds among all those securities which give maximum expected return. The theory assumes that there is a portfolio which gives both maximum expected return and minimum variance and it commend this portfolio to the investor (Markowitz, 1952). In other words, MPT aids an investor to classify, estimate, and control both the kind and the amount of expected risk and return in an attempt to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return (Omisore et al., 2012).

Neoclassical Theory of Investment

The Neoclassical Theory of Investment propounded by Jorgenson (1963) is based on the determination of the optimal capital stock that maximize its present value in line with the profit maximization objective of the firm. In other words, the theorist

presents a theory of investment behavior based on the neoclassical theory of optimal accumulation of capital (Jorgenson, 1963). The theory rests on the fundamentals that demand for capital stock is determined to maximize net worth and net worth is conceptualized as the integral of discounted net revenues. Furthermore, according to the author, all prices, including the interest rate, are assumed to be fixed. In sum, the neoclassical theory of capital is based on the notion that firms investing capital in a production is to maximize utility such that which will lead to maximization of the net worth of the enterprise as the criterion for optimal capital accumulation.

Empirical Review

Empirically, Obaro et al (2022) worked on the relationship between diversification strategy and the Nigerian banking industry‘s performance from 1999-2020. The study concludes that diversification is instrumental to the bank performance in Nigeria such that asset diversification, investment diversification, and product diversification exerted positive high effect on bank performance in Nigeria. Meanwhile, deposit diversification exerted negative yet statistical minimal effect on Nigerian banks' performance.

Furthermore, Obiora and Ujam (2021) investigated the effect of portfolio management on performance of listed deposit money banks in Nigeria for the period, 2016-2020 using linear regression technique. The study indicates the existence of a significant and positive relationship between credit risk management; liquidity risk management and performance of banks in Nigeria. In another study, Uniamikogboe et al (2021) investigated the effect of income diversification on financial performance of banks in Nigeria during 2008 to 2018. The study found evidence of commission income having a significant positive effect on the financial performance of banks, unlike foreign exchange income and firm age which have significant negative effect on the financial performance of banks in Nigeria.

Also, analyzed by Adaramola and Ogunsakin (2020) is the nexus between portfolio management and bank performance using multiple and logit regression analyses. The study found that loan risk analysis, loan risk diversification and loan risk monitoring have positive and significant effect on bank performance in Nigeria. Using panel data analytical technique, Salman et al. (2020) investigated the relationship between the investment portfolio and banking financial performance in Nigeria. The study reveals that investment in bond has a significant but negative effect on return on the asset unlike both cash reserve and treasury bills which have positive and negative effect respectively but the effect is not statistically significant.

Ankrah (2019) evaluated the impact of information systems investment on bank performance in Ghana. From the survey, the found that information systems

investment has a positive relationship with bank performance. During 2013-2017, Hailu and Tassew (2018) studied the impact of investment diversification on financial performance of Ethiopian commercial banks. Findings from the panel random effect regression model show that investment in financial assets, government security, insurance, loan portfolio and investment size have positive significant impact on financial performance of Ethiopian banks unlike interest and exchange rate volatility which have negative significant impact on financial performance of commercial banks in Ethiopia.

In a study on the impact of fixed assets investments on financial performance of selected banks in Nigeria carried between 2002 and 2014 by Okobo and Ikpor (2017), the impact of cost of maintenance and repairs, additions and impairments on return on Assets of banks constitute the variables of the study. Findings from the multiple regression indicate that cost of maintenance and repairs have a negative and significant impact on return on assets of banks. Also, the study revealed a negative and significant relationship between additional acquisition of fixed assets and return on assets of banks. Furthermore, the study shows a negative and significant relationship between impairments of fixed assets and return on asset. In Kenya, Hussein (2017) examined the nexus between investments and financial performance of commercial banks using correlation and regression techniques. The study reports evidence of an insignificant negative relationship between investment in government securities, investment in properties, and return on assets. The study also establishes evidence of an insignificant positive link between corporate bonds and return on assets of commercial banks in Kenya. Moreover, a significant positive relationship between was however, found between investment in stocks and return on assets of the commercial banks in the country.

Makokha et al (2016) assessed the effect of portfolio diversification on commercial banks financial performance in Kenya based on correlation analysis and bivariate regression analysis. The study established a positive and significant relationship between portfolio diversification and financial performance. In the same 2016 in Kenya, the effect of asset diversification on the commercial banks financial performance from 2011 to 2015 was examined by Mutega (2016). The study found financial assets, loans, cash and cash equivalent, and other investments to positively affect the financial performance of commercial banks in Kenya.
In Pakistani context, Nisar et al (2015) applied fixed effects regression model to the financial data of all Pakistani scheduled banks from 2005 to 2012 while studying the effect of investments on banking sector profitability during global financial crisis. Results of the fixed effects model prove the existence of a negative relation of investments with profitability.

Turkmen and Yigit (2012) determined the effect of sectoral and geographical diversification on the performance of Turkish banks between 2007 and 2011. The study confirms the existence of a geographical diversification producing negative

effect on the performance of Turkish banks.

Exposed in the review of literature is the dearth of study on the effect of investment securities on the financial performance of banks, particularly in a developing country like Nigeria. Although, past studies have examined in relation to banks performance issues like diversification strategy, portfolio management, income diversification, investment portfolio, portfolio diversification, sectoral and geographical diversification, information systems investment, investment diversification, fixed asset investment and investments generally. This empirical lacuna is what this study currently attempts to fill.

Methodology

In the period of this study, 2010 to 2020, the effect of investment securities on the financial performance of banking business of deposit money banks was examined based on ex-post facto research design. Thus, secondary data on annual basis obtained from the published financial statements of selected deposit money banks in Nigeria were employed in the investigation.

The population of the study is the 15 deposit money banks in Nigeria listed on the Nigerian Stock Exchange (NSE) as at December 2020 and nine of these banks purposefully selected constitute the samples for this study. The samples were purposefully sampled based on the criteria that the banks were listed on the NSE for the period 2010-2020 and their annual financial statements are published and accessible.

The variables of study are described in Table1.

Table1: Variables description and measurement

Specification	Variable	Notation	Measured by
Dependent variables:	Earnings per share	EPS	Net profit/number of shares
	Return on assets	ROA	Net profit/total assets
	Return on equity	ROE	Net profit/shareholders‘ equity
Variable of interest:	Investment securities	INVESTSEC	Monetary value of total investment securities
Control variables:	Bank size	BSIZE	Natural log. of total assets
	Loan and advances to customers	LATC	Monetary value of total loans and advances granted to customers by the banks

In this study, to evaluate the effect of investment securities on the financial performance of banking business of DMBs in Nigeria, banks financial performance is expressed mathematically as a function of investment securities as in equation (1). $\text{Banks financial performance} = f[\text{investment securities}]$ (1) The core variable of interest is investment securities (INVESTSEC), and financial performance is measured as return on assets (ROA), return on equity (ROE), and

earnings per share (EPS). The control variables are bank size (BSIZE), and loan and advances to customers (LATC).

Therefore, equation (1) is expanded to accommodate the measures of the variables of study and this presented in equations (2.1), (2.2), and (2.3) respectively.

$$EPS = f(INVESTSEC, LATC, BSIZE) \quad (2.1)$$

$$ROA = f(INVESTSEC, LATC, BSIZE) \quad (2.2)$$

$$ROE = f(INVESTSEC, LATC, BSIZE) \quad (2.3)$$

Flowing from equations (2.1), (2.2) and (2.3), therefore, the three Panel ARDL models for the study are specified in equations (3.1), (3.2), and (3.3):

$$EPS_{it} = ß_0 + \sum_{i=1}^{k} \boldsymbol{\Psi}_i \Delta EPS_{it-i} + \sum_{m=0}^{o} \gamma_m \Delta Log(INVESTSEC)_{it-m} + \sum_{j=0}^{l} ß_j \Delta Log(LATC)_{it-j} + \sum_{0}^{p} \alpha_n \Delta BSIZE_{it-n} + \boldsymbol{\delta}_1 EPS_{it-1} + \boldsymbol{\delta}_2 Log(INVESTSEC)_{it-1} + \boldsymbol{\delta}_3 Log(LATC)_{it-1} + \boldsymbol{\delta}_4 BSIZE_{it-1} + ECT + e_{it} \quad (3.1)$$

$$ROA_{it} = ß_0 + \sum_{i=1}^{k} \boldsymbol{\Psi}_i \Delta ROA_{it-i} + \sum_{m=0}^{o} \gamma_m \Delta Log(INVESTSEC)_{it-m} + \sum_{j=0}^{l} ß_j \Delta Log(LATC)_{it-j} + \sum_{n=0}^{p} \alpha_n \Delta BSIZE_{it-n} + \boldsymbol{\delta}_1 ROA_{it-1} + \boldsymbol{\delta}_2 Log(INVESTSEC)_{it-1} + \boldsymbol{\delta}_3 Log(LATC)_{it-1} + \boldsymbol{\delta}_4 BSIZE_{it-1} + ECT + e_{it} \quad (3.2)$$

$$ROE_{it} = ß_0 + \sum_{i=1}^{k} \boldsymbol{\Psi}_i \Delta ROE_{it-i} + \sum_{m=0}^{o} \gamma_m \Delta Log(INVESTSEC)_{it-m} + \sum_{j=0}^{l} ß_j \Delta Log(LATC)_{it-j} + \sum_{n=0}^{p} \alpha_n \Delta BSIZE_{it-n} + \boldsymbol{\delta}_1 ROE_{it-1} + \boldsymbol{\delta}_2 Log(INVESTSEC)_{it-1} + \boldsymbol{\delta}_3 Log(LATC)_{it-1} + \boldsymbol{\delta}_4 BSIZE_{it-1} + ECT + e_{it} \quad (3.3)$$

The variables in the models (3.1), (3.2) and (3.3.) are as defined in Table 1 above. Note that, $\boldsymbol{\Psi}_i$, γ_m, $ß_j$ and α_n are short-run coefficients while $\boldsymbol{\delta}_1 - \boldsymbol{\delta}_4$ constitute the coefficients of the long-run estimation; ECT represents error correction term, and e is the error term.

This study employed panel ARDL (P-ARDL) modelling approach in evaluating the effect of investment securities on the financial performance of Nigerian banking business in both long-run and short-run. The pre-estimations tests conducted are descriptive statistical tests, panel unit root tests (Im, Pesaran and Shin W-stat; ADF - Fisher Chi-square; and PP - Fisher Chi-square tests), panel cointegration tests (Kao cointegration test and Pedroni residual cointegration test), and correlation test.

Results and Discussion

Descriptive Statistics

The descriptive statistics of the variables studied are presented in Table 2.

Table 2: Descriptive statistics

	EPS	ROA	ROE	INVESTSEC	LATC	BSIZE
Mean	1.392323	3.325564	22.64585	342092.1	791600.1	13.86698
Median	0.980000	1.915716	2.123519	209223.0	592957.4	14.09639
Maximum	8.740000	28.28784	1950.138	8113707.	2818876.	15.84694
Minimum	-13.57000	-13.62812	-9.829830	35.55700	596.8270	11.19145
Std. Dev.	2.272067	5.050721	195.7304	824088.2	614322.3	1.201165
Skewness	-2.069901	2.489975	9.793376	8.631644	1.221243	-0.779170
Kurtosis	21.58789	13.74481	96.94413	81.59109	4.130453	2.768726
Jarque-Bera	1495.921	578.5344	37987.71	26707.65	29.88011	10.23787
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.005982
Observations	99	99	99	99	99	99

According to the descriptive statistics in Table 2, the average earnings per share (EPS), return on assets (ROA) and return on equity (ROE) in the period of this study (2010-2020) stood as ₦1.39, 3.33% and 22.65% respectively while the respective mean figures for investment securities (INVESTSEC), loan and advances to customers (LATC) and bank size (BSIZE) stood as ₦342092.1million, ₦791600.1million, and 14.10 respectively. All the variables are not normally distributed. Except EPS which is negatively skewed, all other variables positively skewed. Unlike bank size which is relatively stable around its mean value, all other variables display relative wide dispersion from their mean values.

Panel Unit Root Test

The summary of the four panel unit root tests (Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square) performed in this study are reported in Tables 3 and 4.

Table 3: Panel Unit Root Tests in Level

Variables	Levin, Lin & Chu t	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
EPS	-29.0142* [0.0000]	-9.24316* [0.0000]	44.3933* [0.0005]	29.3264** [0.0445]
ROA	-18.4587* [0.0000]	-5.49669* [0.0000]	56.9425* [0.0000]	37.4482* [0.0046]
ROE	-2.04083** [0.0206]	-1.34984*** [0.0885]	30.5752** [0.0322]	36.9373* [0.0053]
LINVESTSEC	-0.23867 [0.4057]	0.27045 [0.6066]	15.9876 [0.5934]	44.6058* [0.0005]
LLATC	-1.79504** [0.0363]	1.40572 [0.9201]	8.15295 [0.9763]	19.6082 [0.3553]
BSIZE	0.72945 [0.7671]	1.73637 [0.9588]	19.5131 [0.3609]	20.7269 [0.2934]

Note: *, ** and *** denotes stationary at 1%, 5% and 10% significant level respectively; investment securities and Loans and advances to customers are expressed in log forms.

The panel unit root tests conducted at level form of the variables indicate that all the four tests (Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square) unanimously attest to the stationarity of earnings per share (EPS), return on assets (ROA), and return on equity (ROE) in their level form. In the same vein, all the four tests reveal bank size (BSIZE) not to be stationary in level. In case of loans and advances to customers (LLATC), only Levin, Lin & Chu t indicates the variable to be stationary in level while the other three tests **(**Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square) agree that the series is not stationary in level. Moreover, PP - Fisher Chi-square confirms the stationarity of investment securities (LINVESTSEC) in level form while the three tests **(**Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square) say otherwise.

Since none of the four tests confirms the level-form stationarity of one of the variables (bank size) and the stationarity of some of the series (LINVESTSEC and LLATC) are not confirmed by majority of the four tests carried out in the level form of the series, there is therefore the need to re-test the said variables for stationarity after first difference. Hence, the unit root tests at first difference were conducted and the summary of the results are reported in Table 4.

Table 4: Panel unit root tests at first difference

Variables	Levin, Lin & Chu t	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-Square
LINVESTSEC	1.04242 [0.8514]	-0.94672 [0.1719]	23.3005 [0.1793]	85.7482* [0.0000]

LLATC	-6.35147* [0.0000]	-2.90062* [0.0019]	39.6074* [0.0024]	76.1373* [0.0000]
BSIZE	-16.5045* [0.0000]	-3.90323* [0.0000]	43.6222* [0.0007]	80.7337* [0.0000]

Source: Authors (2022). Note: * denotes stationary at 1% significant level; investment securities and Loans and advances to customers are expressed in log forms.

According to the panel unit root tests at first difference in Table 4, all the four tests (Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square) attest to the stationarity of bank size (BSIZE) and loans and advances to customers (LLATC) after first difference. Just like in level form, it is only PP - Fisher Chi-square test that confirms the stationarity of investment securities (LINVESTSEC) after first difference. This implies that the variable (LINVESTSEC) has passed the stationarity test in its level form.

In sum, the stationary tests conducted reveal that except bank size (BSIZE) and loans and advances to customers (LLATC) which are stationary after first difference, all other variables of the study (EPS, ROA, ROE and LINVESTSEC) are stationary in level. This implies that that variables of the study are of mixed order of integration, of order zero and one.

Correlation Analysis

In order to ascertain the nature of relationship between investment securities and banks' financial performance in Nigeria, the Pearson correlation test was conducted for each model (EPS, ROA, and ROE) and the results are summarized in Table 5.

Table 5: Correlation matrix

	I. EPS Model			
	EPS	INVESTSEC	LATC	BSIZE
EPS	1.000000[----]			
INVESTSEC	0.238392**[0.0175]	1.000000[----]		
LATC	0.310044*[0.0018]	0.719110*[0.0000]	1.000000[-----]	
BSIZE	0.330993[0.0008]	0.391855*[0.0001]	0.295235*[0.0030]	1.000000[-----]
	II. ROA Model			
	ROA	INVESEC	LATC	BSIZE
ROA	1.000000[----]			
INVESTSEC	0.043747[0.6672]	1.000000[----]		
LATC	0.027034[0.7905]	0.719110*[0.0000]	1.000000[-----]	
BSIZE	-0.393356*[0.0001]	0.391855*[0.0001]	0.295235*[0.0030]	1.000000[-----]
	III. ROE Model			
	ROE	INVESEC	LATC	BSIZE
ROE	1.000000[----]			
INVESTSEC	-0.215653**[0.0321]	1.000000[----]		
LATC	0.020416[0.8410]	0.719110*[0.0000]	1.000000[-----]	
BSIZE	-0.171653***[0.0893]	0.391855*[0.0001]	0.295235*[0.0030]	1.000000[-----]

Note: *, **, and *** denote statistically significant at 1%, 5%, and 10% respectively.

The correlation coefficients in Earnings per share (EPS) model (in Panel I) of Table 5, show investment securities (INVESTSEC) to have positive (coefficient=0.238392) and statistically significant (p=-0.0175) correlation with earnings per share of banks in Nigeria. Likewise, both loans and advances to customers (LATC) and bank size (BSIZE) have positive correlation with the EPS of banks in Nigeria in the period studied. However, only LATC is statistically significant.

Furthermore, the correlation matrix in Panel II of the Table (5) shows investment securities (INVESTSEC) to have positive (coefficient=0.043747) and statistically significant (p=0.6672) correlation with return on assets (ROA) of deposit money banks in Nigeria. Similarly, loans and advances (LATC) have positive but non-significant correlation with returns on assets (ROA) of banks unlike bank size (BSIZE) which has negative and significant correlation with ROA of banks in Nigeria.

According to Panel III of Table 5, investment securities (INVESTSEC) with a coefficient and p-value of -0.215653 and 0.0321 respectively, suggests the existence of a negative and significant correlation between return on equity (ROE) and investment securities of Nigerian banks in the period examined.

Panel Cointegration Test

In order to ascertain the cointegration properties of investment securities and financial performance of banks in Nigeria between 2010 and 2020, the Kao, and Pedroni Residual cointegration tests of the panel data were conducted and the results are reported in Table 6.

Table 6: Kao residual cointegration test result

	EPS Model	**ROA Model**	**ROE Model**
Test	T-Statistic	T-Statistic	T-Statistic
ADF	-1.986733**[0.0235]	1.919463**[0.0275]	1.531356***[0.0628]
Residual variance	8.116082	23.20651	83357.70
HAC variance	2.010075	5.956451	8195.778

Source: Authors (2022). Note: *, ** and *** denote rejection of null hypothesis of no cointegration among the variables at 1%, 5% and 10% level respectively.

Based on the results of the Kao cointegration test above, the null hypothesis of no cointegration is rejected in each of the three models and hence the conclusion that there is long-run cointegrating relationship between investment securities and financial performance of banks in Nigeria.

Furthermore, and the results of Pedroni residual cointegration test are reported in Table 7.

Table 7: Pedroni residual cointegration tests

	Null Hypothesis: No cointegration					
	EPS Model		**ROA Model**		**ROE Model**	
	Statistic	**Weighted**	**Statistic**	**Weighted**	**Statistic**	**Weighted**
Within-Dimension:		**Statistic**		**Statistic**		**Statistic**
Panel v-Statistic	0.794115 [0.2136]	-2.175316 [0.9852]	-1.228042 [0.8903]	-1.363623 [0.9137]	-1.380927 [0.9163]	-1.754882 [0.9604]
Panel rho-Statistic	1.350923 [0.9116]	1.450697 [0.9266]	-0.444915 [0.3282]	0.800470 [0.7883]	1.618824 [0.9473]	0.943687 [0.8273]
Panel PP-Statistic	-1.872567** [0.0306]	-3.685712* [0.0001]	-7.067342* [0.0000]	-4.921842* [0.0000]	-9.669344* [0.0000]	-4.641276* [0.0000]
Panel ADF-Statistic	-0.617532 [0.2684]	-3.147108* [0.0008]	-0.658398 [0.2551]	-1.924008** [0.0272]	-4.354761* [0.0000]	-1.894487** [0.0291]
Between-Dimension:						
	Statistic		**Statistic**		**Statistic**	
Group rho-Statistic	2.776377 [0.9973]		2.333376 [0.9902]		2.378960 [0.9913]	
Group PP-Statistic	-4.553626* [0.0000]		-5.280731 [0.0000]		-5.074113 [0.0000]	
Group ADF-Statistic	-2.665180* [0.0038]		-1.788303 [0.0369]		-0.851509 [0.1972]	

Note: *, ** and *** denote rejection of null hypothesis of no cointegration among the variables at 1%, 5% and 10% level respectively.

From the Pedroni residual cointegration test (in Table 7) as shown in the within-dimension tests, both Panel PP-Statistic and Panel ADF-Statistic attest to the long-run cointegrating relationship between investment securities and financial performance of banks in Nigeria while in the Between-dimension test, both Group PP-Statistic and Group ADF-Statistic confirm the existence of cointegration between investment securities and financial performance of banks in Nigeria.
In sum both the Kao and Pedroni residual cointegration test show evidence of a long-run cointegrating relationship between investment securities and financial performance of banks in Nigeria in the period of this study.

Panel Autoregressive Distributed Lag (P-ARDL) Models Estimation
Since the cointegrating variables are of mixed order I(1) and I(0), P-ARDL technique was applied to the series to model long run and short run effect of investment securities on the financial performance of banks in the Nigeria. The results of the ARDL model for three models (EPS, ROA and ROE) are as presented in Panels I, II and III of Table 8 respectively.

Table 8: Panel autoregressive distributed lag (P-ARDL) models estimate

Method: ARDL			
	I	**II**	**III**
Dependent Variable:	EPS	ROA	ROE
Independent Variable	**Long Run Equation**		
LINVESEC	-0.012814[0.9235]	0.087362[0.5246]	-1.006108*[0.0000]
LLATC	0.127000[0.5830]	0.062042[0.7184]	0.961762*[0.0000]
BSIZE	0.335422[0.3032]	-0.602603**[0.0227]	0.373657[0.1396]
	Short Run Equation		
ECT	-0.589428*[0.0014]	-0.452536[0.2639]	-0.633728*[0.0001]
D(LINVESEC)	0.847349[0.4637]	0.294833[0.8448]	-25.03093[0.3228]
D(LLATC)	0.319326[0.8184]	0.444318[0.8135]	-278.2906[0.3187]
D(BSIZE)	-0.110708[0.9210]	-0.054247[0.9770]	27.48460[0.2848]
C	-3.026216**[0.0109]	5.603531[0.1175]	41.58308[0.3425]
Mean dependent var	0.078889	0.220301	0.135026
S.E. of regression	1.145778	3.749169	229.2258
Sum squared resid	66.95322	716.8698	2679767.
Log likelihood	-43.74943	-122.0589	-159.8278
S.D. dependent var	2.894323	4.852391	291.8383
Akaike info criterion	1.853524	3.435532	4.198541
Schwarz criterion	3.111764	4.693772	5.456781
Hannan-Quinn criter.	2.362610	3.944618	4.707627

Note: * and ** denote statistically significant at 1% and 5% respectively.

As revealed in Panel I of the Table (8), investment securities have long-run negative and non-significant effect on earnings per share of deposit money banks in Nigeria. However, in the short-run, investment securities‘ effect on earnings per share of the selected banks is still negative but this time around, statistically significant. Loans and advances to customers and bank size do not have significant effect on earnings per share in both long-run and short-run. The ECT, the error correction term indicates the speed of adjustment from short-run equilibrium to the long-run equilibrium state and the greater the coefficient of the parameter, the higher the speed of adjustment of the model from short-run to the long-run and vice versa, smaller the coefficient of the parameter, the lower the speed of adjustment of the model from short-run to the long-run. In the EPS model, the ECT which is negative (-0.589428) and statistically significant (p=0.0014) indicates a dynamic adjustment from short-run to long-run at the rate of about 59% per annum Furthermore, investment securities have positive but non-significant effect return on assets of Nigerian DMBs in both long-run and short-run (Panel II of Table 8). Loans and advances has no significant effect return on assets in both short and long-runs. Bank size has long-run negative and significant effect on return on assets of banks in Nigeria but in the short-run, the variable does not exert significant effect on return on assets of the selected banks. In the ROA model, the ECT which is negative (-0.452536) and but statistically non-significant (p=0.2639) indicates a dynamic adjustment from short-run to long-run at the rate of about 45% per annum. In other words, the coefficient of the ECT which is about 0.45 suggests that 45% of the errors in the short-run have the potential of being corrected in the

long-run in the model.

Furthermore, based on the results of ROE model in Panel III of the Table (8), investment securities have negative and statistically significant effect on return on equity of banks in Nigeria. Loans and advances has positive and significant effect on return on equity of banks in Nigeria in the long-run but in the short-run, the variable exerts no significant effect on return on equity of banks in the country. Bank size has no significant effect on return on equity of Nigerian banks in the period of this study. In the ROE model, the ECT which is negative (-0.633728) and but statistically non-significant (p=0.0001) at 1% suggests that about 63% of the errors in the short-run are corrected in the long-run in the ROE model.

Conclusion and Recommendations

In the period of study, 2010 to 2020, the subject matter of effect of investment securities on the financial performance of deposit money banks in Nigeria was explored using Panel Autoregressive Distributed Lag (P-ARDL) technique. Three models were estimated in this study with each having earnings per share, return on assets and return on equity, respectively, as their dependent variable and investment securities, loan and advances to customers, and bank size as explanatory variables for each of the three models.

Empirically, this study establishes the existence of a cointegrating relationship between investment securities and banks' financial performance in Nigeria. A positive and significant correlation was also found to exist between investment securities and each of earnings per share and return on assets of deposit money banks in Nigeria unlike a negative and significant correlation which exists between return on equity and investment securities of banks in Nigeria. Moreover, this study found evidence of investment securities having long-run negative and non-significant effect on earnings per share of deposit money banks in Nigeria. However, in the short-run, investment securities' effect on earnings per share of banks is negative but statistically significant. It was also discovered that investment securities have positive but non-significant effect return on assets of banks in both long-run and short-run. Finding from this study is also of the fact that investment securities have negative and significant effect on return on equity of banks in Nigeria in both long-run and short-run.

It is therefore concluded that investment securities negatively affect the financial performance of banking business of deposit money banks in Nigeria. This suggests that rather enhancing financial performance of banking business of deposit money banks in Nigeria, investment securities tend to suppress the banks financial performance in the period of investigation.The study recommends that banks' management should avoid commitment of huge funds into investment in financial securities. Rather, they should diversity their investment portfolio such that less

amount is committed to unprofitable investment securities whose returns are easily eroded by market risks.

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