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INCOME DIVERSIFICATION STRATEGIES AND FINANCIAL PERFORMANCE OF NIGERIAN DEPOSIT MONEY BANKS

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Abstract: This study focused on Income Diversification Strategies and Financial Performance of Nigerian Deposit Money Banks are centered on three specific objectives: to determine the effect of loan income on financial performance of Deposit Money Banks in Nigeria; to ascertain the effect of foreign exchange transaction income on financial performance of Deposit Money Banks in Nigeria; to examine the effect of electronic banking transaction fees income on financial performance of Deposit Money Banks in Nigeria. The study used secondary data collected from the corporate annual reports and accounts of the deposit money banks and the financial sector statistics component of the Central Bank of Nigeria annual statistical bulletin for various years. The study covered the period 2005-2023. The data were subjected to various estimation tests (graphical trend analysis, descriptive test, unit root test of stationarity, correlation test, panel pooled regression, panel fixed effect regression and panel random effect regression, Hausman test of model suitability, and Lagrange test of cross-sectional dependence) to determine the income diversification on banks'. The findings showed that loan interest income has significant and positive effect on the financial performance of the deposit money banks. The coefficient and p-value is [0.094415, 0.0000]; foreign exchange transaction income has significant and positive effect on the financial performance of the deposit money banks [coefficient is 0.101002, p-value 0.0073]; and electronic banking transaction income has significant and positive effect on the financial performance of the deposit money banks, the

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coefficient of the variable is [1.092108 whereas its p-value is [0.0000]. Based on the results, the study found that income diversification makes important contribution to the financial performance of deposit money banks in Nigeria. While its effect is associated with positive financial outcomes, the strength or quantum of such effect were also high. The study recommended among others that: deposit money should banks be more committed and proactive towards implementing interest generating loan/credit intermediary products by recognising and taking remedial steps in issues relating to loan interest income growth as it is better reflected in the financial performance measures. The banks should consolidate on their foreign exchange rate transaction fees which continue to generate wealth for shareholders and the long term performance of the firms.

Keywords: Credit Intermediary, Electronic Banking income, Financial Performance, Foreign Exchange Rate Transaction Fees, Loan Income

1. INTRODUCTION

1.1 Background to the Study

Income diversification has become a critical strategy approach for Dmbs in nigeria in response to increasing competition regulatory refunds technological advancement and economic volatility. Nigeria banks relied heavily fluctuations in interest rate, rising non performing loans and tighter regulatory requirement have reduce the reliability of interest based income, compelling banks to explore alternative revenue streams income diversification involves expanding banks earnings beyond conventional lending activities to include non interest income such as fees and commission from electronic transactions foreign exchange dealings and other service based operations. These diversified income sources are considered capable of stabilizing earnings, spreading risk and improving overall financial performance (Ele & Okwaiji, 2025).

Financial performance remains a key indicator of the health and sustainability of the banks and is commonly measured using profitability ratio such as ROA and ROE in the Nigeria banking environment understanding the relationship between income diversification strategies and performance is essential as it provides insight on how banks can enhance profitability manage risk and remain resilience rapidly evolving in financial system

The sources of income of banks had been diversified away from a focus on interest activities to noninterest activities. This has given rise to electronic banking activities which yield incomes through electronic transfer levy, card

maintenance fees, etc. Thus, banks are now further diversifying their income sources towards areas such as exchange rate transaction fees, loan processing fees, investment advisory fees, transaction fees etc. Deposit Money Banks (DMBs) have advanced from what used to be their core line of business, which is, mobilizing deposits and advancing loans, to other financial earning intermediation services such as derivative arrangements, provision of financial guarantees, investments, foreign exchange transactions, among others (Uniamikogbo, Okoye & Arowoshegbe, 2021).

Deposit Money Banks (DMBs) in Nigeria have traditionally depended on interest income mainly from loans and advances as their primary revenue source. However, recent economic instability, fluctuating interest rates, increased regulatory pressure by the Central Bank of Nigeria (CBN), and evolving customer needs have prompted banks to seek alternative income streams. Consequently, income diversification through non-interest income such as fees, commissions, and trading income has become an increasingly relevant strategy for improving the financial performance of DMBs.

Despite this shift, the effectiveness of income diversification as a tool for enhancing financial performance in the Nigerian banking sector remains unclear. Some studies suggest that diversification improves bank profitability and reduces risk, while others argue it may dilute focus, increase operational complexity, or expose banks to unfamiliar risks. Despite the creation of risk management department in all the deposit money banks which is responsible for managing the banks' risks, including credit risks, available record show that the spate of bad loans (non-performing loans) was as high as 35% in Nigerian deposit banks between 1999 and 2009 (Sanusi, 2010). This has further aggravated to almost 46% in 2022 (Yunusa, Arikewuyo, Olowofela & Sanyaolu, 2022). b

Furthermore, there is limited empirical evidence on how income diversification specifically affects the financial performance of DMBs in the Nigerian context, where macroeconomic volatility, policy inconsistency, and financial inclusion gaps are major concerns.

Secondly, while electronic banking transaction fees and card maintenance fees consistently show a positive impact in Nigerian studies (Ele et al., 2024; Ele & Okwaiji, 2025; Jolaiya & Adekunle, 2023), the impact of foreign exchange transaction income presents a conflicting picture within Nigeria.

Uniamikeogbo, Okoye & Emos (2021) found a significant negative effect of foreign exchange income on Tobin's Q ratio for Nigerian DMBs, directly contrasting the positive implications from studies like Lambe (2018) and the general positive sentiment around non-interest income. This divergence regarding foreign exchange income's specific effect on financial performance in Nigeria points to an area requiring further focused investigation to reconcile these opposing findings and understand the underlying reasons for such variability (e.g., sensitivity to market volatility, specific bank strategies, or measurement approaches).

In addition, while investment in debt and equity securities is mentioned (Amahalu, Okudo & Ezechukwu, 2023), and Armstrong (2015) in Kenya investigated investment advisory income, there appears to be a relative scarcity of recent, direct studies specifically examining the impact of "investment advisory fee income" on the financial performance of Deposit Money Banks in Nigeria. Many studies group various non-interest income streams or focus on broader categories. A dedicated analysis of this specific income stream within the Nigerian banking sector would provide valuable, underexplored insights.

Regardless of the increasing volume of past research on the effect of income diversification on the financial performance of organizations, a few vital gaps persist, and this is with respect to deposit money banks (DMBs) in Nigeria. Quite a few of the pieces of existing literature has been devoted to examining financial institutions like banks, on developed or advanced economies. These are economies with advanced financial systems and may lack the idiosyncrasies that exist in the financial systems of emerging or developing economies. Based on this, these studies fail to capture not just the important but specific dynamics associated with the operations of deposit money banks in developing and emerging economies like Nigeria. This creates contextual, conceptual and empirical gaps in literature. Furthermore, past studies often focused on examining short-term effects, hence neglecting the possibilities of long-term effects of income diversification when there are differing economic cycles, financial crises, economic downturns and regulatory changes which occurs over an extended given period such as 2004 to 2023. For instance, Nigeria has recorded many reforms in the banking sector over the past two to three decades. This creates time-related gap.

Since Nigerian financial space is still an evolving financial landscape, with deep influence from internet and digital penetration, the influence of non-interest income to DMB's revenues, as well as the recent creative disruptions from innovative fintech's like Opay, Palmpay and MoniePoint, there is a need for holistic analysis of the effect of income diversification on the financial performance of DMBs in Nigeria. This research aims to fill the gaps by providing an in-depth empirical appraisal of the long-term effect of income diversification on the financial performance of DMBs in Nigeria from 2004 to 2023, incorporating both traditional and non-traditional performance indicators while considering external moderating factors.

Theoretically and empirically, the impact of diversification on bank performance and stability has been debated on by scholars across the globe and is still debatable. According to portfolio theory, diversified banks benefit from economies of scope which improve performance and reduce risk (Elsas, Hackethal & Holzhäuser, 2010). Incomes from different sources which are uncorrelated or imperfectly correlated with each other result in steady and stable streams of overall bank profits (Chiorazzo, Milani & Salvini, 2008). On the contrary, if the diversified activity is inherently riskier than the traditional banking business, the costs of diversification may outweigh the benefits, and banks may become riskier and their overall performance may deteriorate. Following the above arguments, existing empirical studies have reported mixed evidence on the effect of income diversification on banks' performance. Studies (Berger, Iftekhar & Mingming, 2010;Maudos, 2017) reported a negative impact of diversification on bank performance whereas, Elsas (2010) and Sanya& Wolfe (2011) found a positive association between noninterest income diversification and performance. Given the inconclusive nature and inconsistency in previous studies, this study holds that additional evidence would be needed to validate whether banks' income diversification affects financial performance. Thus, while this study investigated the effect of income diversification on the financial performance of deposit money banks Nigeria from 2005 to 2023. The specific objectives were:

1. To determine the effect of loan income on financial performance of Deposit Money Banks in Nigeria.
2. To ascertain the effect of foreign exchange transaction income on financial performance of Deposit Money Banks in Nigeria.

3. To examine the effect of electronic banking transaction fees income on financial performance of Deposit Money Banks in Nigeria

REVIEW OF RELATED LITERATURE

2.1.1. Income Diversification

Income diversification is defined as the strategic process by which Deposit Money Banks expand their revenue-generating activities beyond traditional interest-based lending to include a broader range of non-interest income sources (Gurbuz et al., 2013). This involves shifting reliance from core intermediation services towards fees, commissions, and other non-lending activities. Also, from a portfolio theory perspective, income diversification refers to the practice of combining various income streams with low or negative correlations, aiming to reduce the overall volatility and risk of a bank's total earnings, thereby enhancing the stability of its financial performance (Markowitz, 1952).

For Deposit Money Banks, income diversification means moving beyond simply earning interest from loans (loan income) to also generating revenue from services and transactions. This includes, for instance, fees from foreign exchange activities (foreign exchange transaction income), charges for digital banking platforms (electronic banking transaction fees income), recurring charges on payment cards (card maintenance fees income), and earnings from advising clients on investments (investment advisory fee income).

2.1.2. Interest/Loan Income

Hundaya & Ibrani (2016) explained that interest income is the amount earned by banks for lending its money or letting another entity use its funds. On a larger scale, interest income is the amount earned by depositor's money that the banks have placed in an investment or project. Interest income is usually taxable income and is presented in the income statement because it is an income account. A very simple example of interest income that happens every day is when an individual deposits money into a savings account and decides to leave it untouched for several months or years (Halm, 2018). The money is not left to idle away, because the bank uses it to lend money to borrowers. The bank will earn interest by lending money out, but will also pay interest to holders of deposit accounts.

2.1.3. Foreign Exchange Transaction Income

As defined by the Business Dictionary (2015), foreign exchange is any currency other than the local currency which is used in settling international transactions and also a system of trading in and converting the currency of one country into that of another. Foreign exchange transaction simply means an agreement of exchange of currencies of one country for another at an agreed exchange rate on a definite date. It is the term used to describe all operations conducted by businesses or individuals that are denominated in a currency other than a company's functional currency. Foreign exchange transaction income refers to the non-interest income earned as a result of fluctuations in the exchange rate between the transaction currency and reporting currency which yielded variations in the amount of transaction reported in the financial statements. Examples of foreign exchange transaction income include income from foreign currency and hedging transactions pertaining to foreign currency translation of receivables and payables as well as of currency derivatives and other hedging transactions, income from translation of financial statements in foreign currencies which contained gains from the translation of companies whose local currency is different from the functional currency. The correlation between foreign exchange transaction and banking sector profitability is current issue in literature and has remain newsworthy among researchers, economists and policy makers alike (Ani, 2023).

2.1.4. Electronic Banking Income

Electronic transfer charges is defined as the charged by banks for transactions conducted through electronic channels (non-over the counter transactions). The Electronic Money Transfer Levy Regulations, 2022 was signed into law in 2023 to regulate electronic charges by banks on customers. This was pursuant to her powers under Section 89A (3) of the Stamp Duties Act Cap S8 Laws of the Federation of Nigeria, 2004 (SDA), as amended by Finance Act, 2021. Electronic banking involves the delivery of financial services outside conventional bank branches, using technologies such as card-reading Point-of-Sale (POS) terminals, Automated Teller Machine (ATM), Mobile Phones, Internet, and so on to transmit transaction details (Onwudiwe, 2017). Among other benefits, e-banking increases banks revenue, customers need not visit the bank's branch and banks have the opportunity of enhancing their customer

base thereby experience improved profits (Okibo & Wario, 2014). Analysis of the audited 2018 annual reports of 11 Deposit Money Banks in Nigeria showed their revenue earned from electronic transactions grew from ₦86.72bn in 2017 to ₦124.5bn in 2018, representing a 43 percent growth rate (Financial Punch, 2019).

2.2. Empirical Review

Manifita, Paminto& Jamaluddin (2024) examined the influence of income diversification and external risk on financial performance and stock prices of banks listed on the Indonesia stock exchange using ex-post facto research design and with 23 banking companies listed on the Indonesia Stock Exchange. The study adopted structural equation model (SEM) and the findings are as follows; Income diversification has a direct negative effect on the financial performance of banking performance and income diversification has a direct positive effect on stock prices. Muriuki, & Musau (2024) investigated revenue diversification and financial performance of commercial banks in Kenya. The researchers adopted ex-post facto research design. 38 commercial banks were selected as samples for the study and all the banks were used as the study's populations as determined using census sampling method data analysis were done using multiple regressions and Pearson's correlation analysis. Findings of the study revealed that fees and commission income had a positive and significant relationship on return on asset of commercial banks in Kenya; and Dividends income also has a strong and positive relationship with return on asset. The researchers recommended that banks need to review transaction rates from time to time to ensure that they derive maximum income for loans.

Ele, Ubom & Onwe (2024) studied the effects of non-interest income on the performance of selected deposit money banks in Nigeria with the use of secondary data, while employing the ordinary least squares regression to estimate the coefficients of the mode. The specific objectives were: to examine the effect of electronic transfer charges on the financial performance of selected deposit money banks in Nigeria, to explore the effect of income from card maintenance fees and stamp duty collections on the financial performance of selected deposit money banks in Nigeria, and to determine the effect of income from commission charges and value added tax collections on the financial performance of selected deposit money banks in Nigeria. The study found

that: income from electronic transfer charges have positive significant effect on the performance of selected deposit money banks in Nigeria, card maintenance fees and stamp duty collections have positive and significant effect on the performance of selected deposit money banks in Nigeria and income from commissions and value added tax collections was found to be positive.

Wahyuningtias, & Kusumawardhani, (2024) studied the moderating effect of income Diversification on intellectual capital and company performance, a case study of banking in Indonesia. The researchers adopted expo facto research design, using 38 banks that are listed on the Indonesia stock exchange (BEI) out of 47 banks were chosen as samples for the study. Data analyses were done using multiple regression methods. The findings of the study revealed that intellectual capital has a positive effect on company performance and that income diversification has a moderate effect on intellectual capital and company performance.

Chude & Chude (2023) researched onthe relationship between bank diversification and bank performance for a period of 5 years (2015-2020), using secondary data and Expo facto research design and (OLS) regression. The Findings of the study are that Diversification into commission on loan has a significant effect on financial performance of banks in Nigeria and Diversification into investment income of the financial performance of commercial banks in Nigeria is not significant. The researchers recommended that the firm should pursue a diversification strategy to diversify their risk exposure. Phan et al (2022) examine the impact of means of diversification on the business performance of Vietnamese commercial banks with the aid of Expo facto research design. Using secondary data for GMM regression method with 29 commercial banks that are listed on both Ho chi Minh stock exchange in the period of 2010-2020. The finding of the work was that business performance is influenced by many factors like income diversification, sale of credit facilities and efficiency of physical management.

2.3. Theoretical Framework

The theoretical framework adopted for this study is the Modern Portfolio Theory. The Modern Portfolio Theory (MPT) is an investment theory developed by Markowitz in 1952. MPT is an investment framework for the selection and diversification of investment portfolios based on the maximization

of expected returns of the portfolios and the simultaneous minimization of investment risk (Fabozzi, Gupta& Markowitz, 2002). This theory develops a framework where, any anticipated return has different expected outcomes, thus, guides the investor on ruling on investment portfolios. The Modern Portfolio Theory (MPT) is adopted in this study as the most appropriate economic theory on finance and investment management, because literature on banks' diversification of products and services essentially from interest based activity towards noninterest based activity and its characteristics revolve principally around the modern portfolio theory. Also, a number of factors such as complete information available in the markets, investing in portfolio stocks rather than individuals and diversified portfolios held by investors over short observation periods and many more are the reasons for the choice of MPT model in explaining the risk-return trade-off.

Modern Portfolio Theory (MPT), developed by Harry Markowitz, proved to be suitable for the theoretical framework of this study on income diversification and the financial performance of Deposit Money Banks (DMBs) in Nigeria. MPT fundamentally posits that investors can construct portfolios of assets that maximize expected return for a given level of risk, or minimize risk for a given level of expected return, through diversification. MPT argues against putting "all your eggs in one basket. In the context of DMBs, this means not relying solely on traditional interest income (e.g., from loans). By diversifying into various non-interest income streams (foreign exchange transactions, electronic banking fees, investment advisory fees, card maintenance fees), banks can reduce the overall volatility and risk of their total income portfolio. If one income source experiences a downturn, others may remain stable or even increase, thereby stabilizing overall financial performance.

MPT directly links to financial performance measures like Return on Assets (ROA) and Return on Equity (ROE) by optimizing the risk-return trade-off of the bank's income portfolio. A well-diversified income portfolio, guided by MPT principles, aims to achieve: higher expected returns, lower overall risk and enhanced stability. Therefore, applying MPT as the theoretical framework allowed the study to analyze how DMBs in Nigeria, by strategically combining their various income streams, strive to create an "efficient frontier" of earnings that maximizes their profitability while managing inherent risks.

DATA, MODEL AND METHODS

The study adopted the *ex-post facto* research design. This design is suitable for studies which hope to employ past values in study impacts and variations produced by treatment variables The source of data for the study was secondary data collected from the corporate annual reports and accounts of the deposit money banks and the financial sector statistics component of the Central Bank of Nigeria annual statistical bulletin for various years. The study covered the period 2005-2023. The study adopted Okoye *et al* (2021) predictive model which modeled financial performance of deposit money banks as a function of income diversification. The model was expressed functionally as:

Financial performance = f(Foreign exchange transaction income, commission income) 1

The above model was modified by the addition of loan processing fee income and investment advisory fee income. Thus, the model for the current study is functionally specified as

$$FP = f(FXI, LIN, EBI, IAF, CMF)$$

The econometric model is expressed thus:

$$FP_t = ß0 + ß_1FXI_t + ß_2LIN_t + ß_3EBI_t + ß_4IAF_t + ß_5CMF_t + \varepsilon it \quad 2$$

Where:

FP = financial performance proxy by the return on assets.

FXI = Foreign exchange transaction Income.

LIN = loan income.

EBI = Electronic banking charges income.

Since the study focus on different banks, the study will transform the model above into a panel data regression model by including the cross section effect (i), thus the panel econometric model for the study will be:

$$FP_{it} = ß0 + ß_1FXI_{it} + ß_2LIN_{it} + ß_3EBI_{it} + \varepsilon it \quad 3$$

Where;

t = time series effect notation.

i = cross section effect notation.

ß0 = the intercept coefficient.

ß1 – ß4 = the coefficients of the parameter estimate.

ε = error term.

Table 2: Description of Variables in the Study

Variable	*Proxy/ Indicator*	*Type*	*Symbol*	*Definition*	*A priori expectation*
Financial Performance	Return on Assets	Dependent	ROA	This measures the entirety of the profitability and efficiency of the DMBs. ROA = Net Income divided by Total Assets	
Income Diversification	Foreign Exchange Transaction Income	Independent	FXI	This is the income earned from foreign exchange trading (FOREX), currency swaps, international trade financing, spot trading, current conversion, and remittance services	[+]
	Loan Income	Independent	LIN	This is interest income earned through the granting of loans and other advances	[+]
	Electronic Banking Charges Income	Independent	EBI	This is income earned from electronic, mobile, and online banking transitions offered to customers for deposits, payments and transfers	[+]

Researcher's compilation, 2024

The analytical techniques employed in the study include, the Fisher Augmented Dickey Fuller panel Unit Root test, the correlation test, the descriptive test, graphical trend analysis, the panel pooled regression and the panel fixed effect regression and the panel random effect regression. This was followed by the Hausman test and the lagrange multiplier test of significance for the random effects model etc. The study carried out these tests using E-views statistical software in order to establish the reliability and robustness of the thesis findings. A non-stationary series could be made stationary by differencing once or twice to produce an integrated series. It could be integrated of order 0 which is often denoted as 1(0), order 1 represented as 1(2) or order 2 represented as 1(2) or even mixed order.

4. RESULTS AND DISCUSSION

4.1. Data Analysis

The panel data was generated for the model variables (dependent variable: return on assets and independent variables: bank income diversification). The data was for the 21-deposit money banks; for the period 2005-2023. The data were subjected to various estimation tests (graphical trend analysis, descriptive test, unit root test of stationarity, correlation test, panel pooled regression, panel fixed effect regression and panel random effect regression, Hausman test of model suitability, and Lagrange test of cross-sectional dependence) to determine the income diversification on banks' performance.

4.2. Panel Unit Root Test of Stationarity

The first pre-estimation diagnostic test performed on the data was the unit root test of stationarity. Stationarity is an important concept in time series analysis. It usually implies that the statistical properties of a time series (or rather the process generating it) do not change over time. Stationarity is important because many useful analytical tools and statistical tests and models rely on it. Hence, in order to ensure the policy forecasting reliability and suitability of the data employed in this, it was subjected to unit root diagnostic test. For comparison and better standing, the ADF-Fisher Chi-square ant the Philips-Peron unit root tests were carried out, the summary of the result is presented on table 1 below:

Table 3: Unit Root Test Result

ADF-FISHER CHI-SQUARE			*PHILIPS-PERON TEST*			
Variable	*ADF-stat*	*p-value*	*PP-stat*	*p-value*	*Cross section*	*Observation*
FP	91.8326	0.0000	74.3786	0.0004	21	309
LIN	339.425	0.0000	361.718	0.0000	21	309
EBI	104.331	0.0000	349.714	0.0000	21	309
FXI	109.710	0.0000	166.210	0.0000	21 309	

Source: Researcher's computation 2024 (E-views 10)

The results in table 3 above showed that (@ level, the model variable became stationary. Hence, they are integrated of order 1(0). The conclusion of stationarity is based on the fact that following the rule for unit root testing, p-value of the individual (ADF-Chi-square test statistic and the Philips-

Peron Test statistics) of the variables is less than the 5% significance level. The implication of stationary process or series is that the model employed can be relied upon for policy analysis and decision making. The vantage position which stationary series confer is that the result retains the original information which the variable could produce, but which would be lost where difference is involved.

4.3. Descriptive Test

The researcher conducted the descriptive test (table 4 below) showing some selected measures of central tendency and dispersion in the model variables. These measures of central tendency help to view the points of convergence of the variables and their points of divergence. The major statistics of importance were the mean, the standard deviation, skewness, kurtosis and the Jarque-Bera normality statistic.

Table 4: Descriptive Test Result

	FP	*EBI*	*FXI*	*LIN*
Mean	1.397450	12445862	7.898866	1.945136
Std. Dev.	1.188458	1.6997509	0.634900	1.222087
Skewness	3.811327	10.41972	10.54615	3.149218
Kurtosis	16.47497	121.9256	118.1501	15.50128
Jarque-Bera	3605.182	219271.0	206137.4	2947.449
Probability	0.000000	0.000000	0.000000	0.000000
Observations	361	361	361	361

Researcher's Computation 2024 using (E-views)

Statistics has become the universal language of the sciences, and data analysis lead to powerful results on which we rely in answering the questions that arise in production functions. Good statistics come from good data samples, and are used to draw conclusions or answer questions about a population; and good data samples are identified by the statistical measures as we have tested above using the mean, standard deviation, skewness, kurtosis, and Jaque-Bera normality test. From the result of the descriptive test above, the financial performance of the banks (in terms of return on asset) averaged 1.39% annually. The income diversification of the banks averaged 124.45 billion naira, 7.89 billion naira, and 1.945 billion naira for electronic banking income, foreign exchange

transaction income, and loan income respectively. The Jarque-Bera normality statistic also confirms the series to be from a normal distribution (as indicated by the p-values) for each of the model series.

4.7. Effect of Income Diversification on Bank Performance in Nigeria

The broad objective of this study was to ascertain the effect of income diversification the financial performance. To achieve this, the researcher employed the panel regression technique to estimate the coefficients of the model variables. The panel estimation was in three phases (the pooled regression phase, the fixed effect regression phase and the random effect regression

4.5.1 Panel Pooled Regression Analysis

Table 6: Panel Pooled Regression Result

Dependent Variable: FP
Method: Panel Least Squares
Periods included: 21
Cross-sections included: 21
Total panel (balanced) observations: 361

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
EBI	1.65E-08	1.26E-09	13.06117	0.0000
FXI	0.001948	0.002011	0.968737	0.3333
LIN	0.144744	0.022625	6.397422	0.0000
R-squared	0.698383	Mean dependent var		1.397450
Adjusted R-squared	0.694994	S.D. dependent var		4.188458
S.E. of regression	2.313176	Akaike info criterion		4.528874
Sum squared resid	1904.879	Schwarz criterion		4.582736
Log likelihood	-812.4617	Hannan-Quinn criter.		4.550288
Durbin-Watson stat	0.942214			

Researcher's Computation 2024 (Using E-views)

On table 6, the study considered the pooled panel regression. Observing this result, the study pooled all 361 observations together and ran the regression model, neglecting the cross section and time series properties of the data. It was found that the R-squared value for the pooled regression model is 0.698383 indicating that about % of the total variation in the financial performance (ROA) of the banks was explained by the explanatory variables (the income

diversification indicator variables). More so, all the income diversification component variables were indicated to be significant in influencing the performance of the banks. Homogeneous (or pooled) panel data models assume that the model parameters are common across individuals, hence one of the major issues with pooled regression model is that it does not discriminate between various cross sectional units and thus may be blamed for not reflecting the uniqueness (heterogeneity feature) existing within each cross sectional unit, and also it does not distinguish between the various firms that are in the sample. In other words, by combining different firms through pooling, the heterogeneity or individuality that may exist among the banks is lost.

4.5.2. Panel Fixed Effect Regression Analysis

The presence of cross-sectional dependence (CD) makes the choice between available estimators more difficult, hence, heterogeneity is important. Heterogeneous models allow for any or all of the model parameters to vary across individuals. Fixed effects and random effects models are both examples of heterogeneous panel data models

In order to allow for heterogeneity or individuality among the firms by allowing each of the Banks to have its own intercept value; the fixed effect model (FEM) was applied. This became necessary because it is time invariant indicating that although the intercept may change across the individual banks, it however does not change over time. The fixed effect result is presented below:

Table 7: Fixed effect regression result

Dependent Variable: FP
Method: Panel EGLS (Cross-section weights)
Periods included: 21
Cross-sections included: 21
Total panel (balanced) observations: 361
Linear estimation after one-step weighting matrix

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	1.032601	0.046738	22.09333	0.0000
EBI	5.13E-09	2.08E-09	2.470150	0.0140
FXI	0.000532	0.000394	1.350998	0.1776
LIN	0.010884	0.005499	1.979139	0.0486
R-squared	0.742152	Mean dependent var		1.774057
Adjusted R-squared	0.724554	S.D. dependent var		1.856330

S.E. of regression	1.209120	Sum squared resid	492.6842
F-statistic	42.17261	Durbin-Watson stat	0.973362
Prob(F-statistic)	0.000000		

Researcher's Computation 2024 (Using E-views)

From the fixed effect result (table 7 above), the coefficient of determination (R-squared) value of 0.742152 indicates that approximately 74% of the total variation in the performance of the deposit money banks was explained by the income diversification indicator variable; electronic banking income, foreign exchange transaction income, and loan interest income were indicated to be negative.

4.5.3. Panel Random Effect Regression Analysis

Panel series can show unobserved properties. Unobserved heterogeneity is one instance in where correlation between observables and un-observables may be expected. This has been a pervasive problem in cross-sectional analysis. The pooled panel regression and the fixed effect regression do not take care of such. The random effect regression model was applied in order to account for the unobserved effects in fixed effect model.

Table 8: Random Effect Regression Result

Dependent Variable: FP
Method: Panel EGLS (Cross-section random effects)
Periods included: 21
Cross-sections included: 21
Total panel (balanced) observations: 361
Swamy and Arora estimator of component variances

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	0.700318	0.124496	5.625223	0.0000
EBI	1.092108	8.171010	13.31576	0.0000
FXI	0.101002	0.001260	2.794799	0.0073
LIN	0.094415	0.015634	6.039138	0.0000
R-squared	0.598158	Mean dependent var		0.850176
Adjusted R-squared	0.592498	S.D. dependent var		2.958723
S.E. of regression	1.888726	Sum squared resid		1266.387
F-statistic	105.6864	Durbin-Watson stat		0.681884
Prob (F-statistic)	0.000000			

Source: Researcher's Computation 2024 (Using E-views)

The random effect regression results indicated that the income diversification indicator variables were significant. The electronic banking income (EBI), foreign exchange transaction income (FXI), and loan interest income (LIN) all indicated positive effects. The random effect model showed that (59.82%) of the total variations in the financial performance of the deposit money banks were accounted for, by the variations in the explanatory variables (income diversification components). This is evidenced from the R-squared value of 0.598158. The output values indicated that all the income diversification indicators jointly influenced financial performance (the return on assets).

4.5.4. Hausman Test of Model Selection

The random effects model used for panel data assumes that the differences between individuals are random as opposed to fixed. This is modeled by including a fixed intercept and a random variable which varies across the individual firms in place of the individual intercept in the fixed effects model. The error term is assumed to have constant variance and mean zero, similar to a random error term. It is also assumed to be uncorrelated with the predictor variables in the regression, as the error term is. The random effects estimator allowed the study to identify the variables that vary over time as well as those that do not. Additionally, random effects is estimated using GLS while fixed effects is estimated using OLS and as such, random effects estimates generally have smaller variances, therefore random effects model is adjudged to be more efficient. Therefore, to affirm direction and properly inform policy statements arising from the study, there is need to decide between the fixed effect model and the random effect model, the Hausman test solves this. The Hausman test selects the model most appropriate for estimation; it is performed under null hypothesis that the random effects model is the most appropriate. In the

Table 9: Correlated Random Effects - Hausman Test

Equation: Untitled
Test cross-section random effects

Test Summary	*Chi-Sq. Statistic*	*Chi-Sq. d.f.*	*Prob.*
Cross-section random	323.598455	5	0.0819

Source: Researcher's Computation 2024 (Using E-views)

alternative, the fixed-effects model is appropriate. The selection of either fixed effect model or random effect model is based on the statistical significance of the P-value.

Following the result in table 9, the Hausman test statistics p-value for the cross-section random is [0.0819]. This is greater than the 5% (0.05) chosen level of significance. Consequently, the null hypothesis cannot be rejected. Therefore, it was concluded that cross-section random effect model is preferable for prediction of the effect of income diversification on the financial performance of deposit money banks in Nigeria.

4.6. Post Estimation Tests

4.6.1. Cross sectional Dependence Test

A shock that occurs in one of the banks examined in the panel data listed deposit money banks may also affect other banks, and the existence of such a situation indicates cross-section dependence. The presence of cross-section dependence between the series will provide biased and inconsistent empirical results. Cross section dependence can arise due to spatial or spillover effects, or could be due to unobserved (or unobservable) common factors. This creates the need to test for cross sectional dependence of the variables so that the effect produced by the variable does not depend on, or influenced by the effects of the other income diversification indicators. The test result is presented below:

Table 10: Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals
Equation: Untitled
Periods included: 21
Cross-sections included: 21
Total panel observations: 361
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	*Statistic*	*d.f.*	*Prob.*
Breusch-Pagan LM	293.0714	171	0.2011
Pesaran scaled LM	6.600866		0.0971
Pesaran CD	-0.994397		0.3200

Source: Researcher's Computation 2024 (Using E-views)

The test result showed that the p-value of the Breusch-Pagan LM, the Pesaran scaled LM and the Pesaran CD statistic was greater than 0.05 (Breusch-Pagan LM: 0.2011, Pesaran scaled LM: 0.0971, and the Pesaran CD: 0.3200). This implies that there was no presence of cross section dependence in the model which further confirmed that the effects of income diversification on the financial performance of the deposit money banks were random and not fixed. By applying this test, the study was able to identify, and confirm that there was no omitted variable bias in the model or not. Hence, the shocks of the independent variables are random indicating that the model was correctly specified. For a correctly specified model, there should not be any cross - sectional dependence between observations. Where the unobserved components that create interdependencies across cross sections are correlated with the included regressors, these approaches will not work, meaning that the fixed effect (FE) and random effect (RE) estimators will be biased and inconsistent

The result showed that that loan income has significant positive effect on financial performance of Deposit Money Banks in Nigeria. The estimated coefficient value for the loan interest income (LIN) is 0.094915, with p-value of 0.0000. This is an indication that increased loan income will lead to increased level of financial performance, especially in efficient asset utilization as indicated by improved return on assets (ROA). This is in line with the apriori expectation, as it is considered that banks generate more revenue from interest income from their main assets, the positive and significant effect of loan income on the ROA agrees with the findings in Amahalu et al (2017) and Ashraf et al (2023). While Amahalu et al (2017) measured loan income as interest income earned from loans, Ashraf et al (2023) captured it with loan management indicator of loan-to-deposit ratio. However, both studies measured financial performance using ROA, and established that loan income is a significant determinant of improved financial performance of deposit money banks. This implies that interest from loans is the major revenue source for banks given their statutory responsibility in the financial system and in promoting the financial intermediation process. Therefore, this underlines a significant way banks make money. In agreement with Amahalu et al (2017) and Ashraf et al (2023) deposit money banks earn massively from interest collected on loans and advances which are usually short- to medium-term. These loans assume different forms including personal, home, car, and small business loans.

Similarly, it was also found that foreign exchange transaction income has significant positive effect on financial performance of Deposit Money Banks in Nigeria. From the results obtained, the estimated coefficient value for foreign exchange transaction income (FXI) was 0.101002, with a p-value of 0.0073. This is an indication that the non-interested income of deposit money banks earned through foreign exchange transactions influences the financial performance of the banks positively and significantly. In other words, the increased earnings of the banks from foreign exchange transactions will lead to an increase in the level of return on the assets of the banks, an indication that there is enhanced financial performance. Conversely, any decline in the non-interest income from foreign exchange transactions will also lead to a reduction in the return on assets of the banks. This finding aligns with prior empirical evidence while also diverging from some findings reporting in existing literature. The positive and significant effect of foreign exchange transactions on the financial performance of deposit money banks is consistent with the findings of Lambe (2018) and Muturi and Othelo (2018). Accordingly, Lambe (2018) established the effect of foreign exchange transactions on the financial performance of banks in Nigeria by reporting that and an increase in foreign exchange earnings positively and significantly affects the profit after tax (PAT) and return on assets (ROA) of the banks. The researchers implicated the fact that Nigeria has multiple exchange rates and that banks are important platers in the Nigeria foreign exchange market, hence they leverage on arbitrage and other strategies to earn noninterest income from it. These researchers referred to as commission-based revenues. Furthermore, Muturi and Othelo (2018) investigated impact of income from foreign exchange transactions on the financial performance of banks reported similar findings that is the existence of positive impact of the income from foreign exchange transactions on the financial performance of financial institutions. According to the authors, the profitability benefits or income earned are from foreign exchange remittances, speculative gains, and active foreweign exchange trading especially the United States Dollar. In contrast, Uniamikeogbo, Okoye & Emos (2021) reported the existence of negative effect of foreign exchange transactions on the value of deposit money banks in Nigeria as indicated by Tobin-Q. This the authors attributed to high exchange rate volatility occasioned by excessive fluctuations of the official

exchange rates of foreign currencies in the foreign exchange market, hence leading to financial losses for the banks

In the third objective of the study, the researchers sought to examine the effect of electronic banking transaction income on the performance of the deposit money banks. The findings based on the estimated coefficient value for the variable (EBI) was 1.092108with a p-value of 0.0000; hence, electronic banking transaction fees income was shown to have a significant positive effect on financial performance of Deposit Money Banks in Nigeria. This result is consistent with the findings of Saunders et al (2016), Segun (2018) and Ele, Ubom&Onwe (2024) all of whom reported a positive relationship between fees collected from electronic banking transactions and financial performance of banks. In Saunders et al (2016), where how non-interest income, including fees from electronic banking services influence the profitability of banks, was investigated. The authors reported that charges from ATM and other digital banking services contribute significantly to banks' total income, particularly as traditional interest income sources from loans decline. The findings support the argument that banks leveraging technology-driven transactions experience improved financial stability and earnings growth over time. Also, Segun (2018) investigated the effect of electronic banking service on the financial performance of banks in Nigeria and reported from the findings in the study that on various transaction fees generated from ATM withdrawals, mobile banking, online transfers, and POS transactions had a positive and significant effect on the profit level of banks. The author attributed this to a rise in the penetration of internet in the country with many bank customers subscribing to electronic banking due to ease of convenience, perceived lower costs associated with it when compared to traditional banking services, and increase volume and value of financial transactions-payments that passes through electronic banking which attracts proportional charges that swell over the increased volume and value.

The findings of this study carry significant implications for Deposit Money Banks (DMBs) in Nigeria. The positive and significant effects of loan interest, foreign exchange, electronic banking, and card maintenance fee incomes underscore the importance of both traditional lending and these key non-interest revenue streams for enhancing financial performance. Banks should continue to optimize these areas, particularly by investing in digital

infrastructure to capitalize on e-banking and card fee growth. The negative and insignificant effect of investment advisory fee income, however, suggests that this specific diversification strategy may not be yielding expected returns in the Nigerian context, prompting DMBs to reassess its viability, operational efficiency, or market approach for such services.

5. CONCLUSION AND RECOMMENDATIONS

The study examined the effects of income diversification on financial performance of listed deposit money banks in Nigeria from 2005 to 2023 using panel data generated from 21 listed deposit money banks. The summary of the findings were as follows of this study showed that loan interest income has significant and positive effect on the financial performance of the deposit money banks. This statement is based on its coefficient and p-value [0.094415, 0.0000]; foreign exchange transaction income has significant and positive effect on the financial performance of the deposit money banks [coefficient is 0.101002, p-value 0.0073]; and electronic banking transaction income has significant and positive effect on the financial performance of the deposit money banks, the coefficient of the variable is [1.092108 whereas its p-value is [0.0000]. Based on the results, the study found convincing evidence that income diversification makes important contribution to the financial performance of deposit money banks in Nigeria. While its effect is associated with positive financial outcomes, the strength or quantum of such effect were also high. The loan interest income of the banks is associated with an upward growth in financial performance. Thus, income realized from credit intermediation activities appear to contribute to improvement of financial performance. Furthermore, incomes realized from electronic banking fees, and foreign exchange transaction fees of the banks are associated with enhanced financial performance. Based on the findings, the study recommended that: deposit money should banks be more committed and proactive towards implementing interest generating loan/credit intermediary products by recognising and taking remedial steps in issues relating to loan interest income growth as it is better reflected in the financial performance measures. It was further recommended that the deposit money banks should sustain electronic banking transaction fees in order to maintain effectiveness in delivering the desired outcomes and to ensure that more attention is focused on those that enhance financial performance. The banks should consolidate on

their foreign exchange rate transaction fees which continue to generate wealth for shareholders and the long term performance of the firms.

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