International Journal of Social Science and Human Research

ISSN (print): 2644-0679, ISSN (online): 2644-0695

Volume 08 Issue 10 October 2025

DOI: 10.47191/ijsshr/v8-i10-24, Impact factor- 8.007

Page No: 7746-7759

The Influence of Online Transactions on Customers Deposit and Operating Expenses of License Deposit Money Banks (DMBs) In Nigeria

Mary Ovayioza Ezeji[1], Nasiru Abdulsalam Kao'je[2], Yakubu Shaba[3], Mohammed Auwal Babangida[4]

[1,2,3]Department of Accounting, Faculty of Management Sciences, Usmanu Danfodiyo University, Sokoto.

[4]Department of Taxation, Faculty of Management Sciences, Federal University Dutse, Jigawa State.

ABSTRACT: Online transactions policy has gained significant traction over the years, with the increasing acceptability of electronic transaction channels such as Global Pay System (GPS), Corporate Internet Banking (CIB), Mobile Banking System (MBS), Pay-Direct System (PDS), and Remita (RMT). Therefore, this study examines the influence of online transactions policy on customers' deposits and bank operating expenses in Nigeria. Using mixed method sources of data and ex post factor research design, the SEM-PLS models reveal that CIB (p = 0.000), GPS (p = 0.000), MBS (p = 0.029), and PDS (p = 0.000) strongly influence customers' deposits and operating expenses of DMBs in Nigeria. However, the panel regression models indicate that online transaction systems have no significant influence on customers' deposits, and only GPS, with a p-value of 0.021 and MBS, with a p-value of 0.095, increases operating expenses of the sampled DMBs. The study therefore suggests that improved online banking facilities, user education, and policy alignment are required to achieve the full benefit of online transactions policies in Nigeria. The study further recommends that DMBs should avoid a one-size-fits-all digital strategy. Instead, they should tailor digital tools to specific performance objectives such as deposit mobilisation, cost efficiency, and profitability.

KEYWORDS: Online transactions, Customer deposits, Operating Expenses, Global Pay System, Internet Banking, Pay Direct System.

1. INTRODUCTION

The Central Bank of Nigeria (CBN) launched the cashless banking (Online transactions) policy in 2012. On January 1, 2012, a cashless system policy test run began in Lagos state. The second stage of this strategy was implemented in Abia, Anambra, Kano, Ogun, Rivers, and the FCT on July 1, 2013, with statewide implementation on July 31, 2014 (CBN, 2019). This system is not intended to eliminate cash usage in transactions, but rather to limit physical cash handling and the amount of currency in circulation (Gbanador, 2021). The online banking system aims to increase the usage of electronic payment channels such as automated teller machines (ATM), point of sale (POS), mobile banking system (MBS), NIBSS instant payment, NIBSS electronic fund transfer, and other alternative payment channels. The overall impact of the cashless banking system on the performance of DMBs is complex and multifaceted (Okafor, 2020).

Nigeria's online transactions (cashless banking) policy significantly improves business growth and GDP. However, certain disadvantages exist, such as inadequate information systems facilities, the possibility of fraud, high cost of IT facilities, high cost of running a business, and the perception of fraudulent activities linked to the cashless banking system. Nigeria has seen several cybercrimes and frauds over the years due to the cashless banking system's emphasis on electronic money transactions and the country's high degree of unreliable networks (Ogbeide & Fapohunda, 2017).

Studies have been conducted on the influence of online transactions policy and the performance of DMBs (Makinwa, 2021; Okechukwu & Yua, 2021; Akani & Obiosa, 2020; Usman, 2020; Akindayo, Shadera & Solomon, 2020; Gambo, 2020; Nwakoby, Chukwu & Ogbenetega, 2020; Ul-Hug & Hossain, 2020; James & Eloho, 2020; Agu & Agu, 2020; Okafor, 2020; Ignoroje & Okoroyibo, 2020; Ogutu & Fatoki, 2019; Agu & Nwakwo, 2019). These studies have been characterised by inconclusive findings ranging from positive to negative and non-significant relationships.

It has been observed that most of the studies have used variables such as ATM, Mobile Banking System (MBS), POS, CIB, and Electronic Fund Transfer (Akindayo, Shadera & Solomon, 2020; Gambo, 2020; Nwakoby, Chukwu & Ogbenetega, 2020; Ul-Hug & Hossain, 2020; Agu & Agu, 2020; Okafor, 2020) as proxies for online transactions policy. Therefore, this research extends the knowledge gap by addressing the influence of online transactions on customers' deposits and banks' operating expenses in Nigeria. The period covered by most of the studies reviewed (Akani & Obiosa, 2020; Usman, 2020; Agu & Agu, 2020; Okafor, 2020; Ignoroje & Okoroyibo, 2020; Ogutu & Fatoki, 2019) ends at the 2021 government calendar year, indicating that activities for the

years 2022, 2023, and 2024 remained uncovered. It should be noted that 2020, 2021, 2022, and part of 2023 were characterised by the global pandemic, which saw the restriction of banks' operations emanating from the social distancing and also cash crises in 2022 and 2023; hence the usefulness of the various cashless system platforms by the populace in Nigeria and around the world. Therefore, based on the foregoing, this research work studies the influence of online bank transaction systems on customers' deposits and banks' operating expenses in Nigeria, covering 13 years from 2012 to 2024.

2. CONCEPTUAL FRAMEWORK

2.1 Concept of Online Transactions Policy

The Online Transactions Policy (OTP) refers to the conduct of financial transactions without the use of physical currency, leveraging instead credit and debit cards, telephonic and electronic fund transfers, the internet, and mobile banking. Cashless transactions occur using ATM, debit or credit cards, EFTs, or other media that do not require actual cash. Cashless banking is a system that aims to decrease the actual currency in circulation, without eliminating it, by promoting electronic transactions for payments, transfers, and other activities. (Kamboh & Leghari, 2016; Datta, 2021; Ernest & Fadiya, 2022). It signifies a transition period in the advancement of payment systems in most developing nations (Ikpefan, 2018). A cashless economy is the intermediate stage of a three-phase payment system economic model. This suggests that nations, particularly those in the development process, would shift from a mostly cash-based economic system to a cashless economy (Ighoroje & Okoroyibo, 2020).

2.2 Benefits of Online Transactions.

The predicted patronage of online banking transactions system is expected to provide many advantages for various stakeholders. This provides users with more convenience, a broader array of service options, less vulnerability to cash-related crimes, and more economical access to banking services and credit beyond conventional branches. Businesses may benefit from improved accessibility, reduced revenue loss, and decreased expenses associated with cash handling (Atanda & Alimi, 2018); enhanced tax revenue, more access, and improved economic advancement for the government. A cashless banking system would enhance the standard of living by lowering the duration of transactions, boosting sales, simplifying cash collection, minimising transfer and processing costs, improving processing and transaction time, offering several payment options, and delivering instant notifications for all client account operations (Akhalumeh & Ohiakha, 2012; Andabai & Bina, 2019; Asenge, 2019).

2.3 The Challenges of the Online Transactions.

The challenge of online transactions is that banks are vulnerable to various risks, such as transactional, strategic, reputational, and foreign currency threats. Lack of appropriate operational infrastructure, inadequate internet frameworks, and high expenses associated with acquiring and maintaining them sometimes prevent a significant portion of the population from using them, even in areas where they are available (Chison & Mike, 2018).

2.4 Customer Deposit

Customer deposits refer to the money banks hold on their customers' behalf. These deposits are an essential element of a bank's obligations and serve as the foundation for the bank's lending operations. Various categories of deposits include savings, current, fixed deposits, among other deposits accounts. Deriving certain pivotal indicators on client deposits might provide valuable insights into a bank's performance and financial well-being.

2.5 Operating Expenses

Operating expenditures in DMBs refer to the various costs of managing the bank's daily operations. These expenditures are essential for continuing banking services and maintaining a competitive position in the financial market. Typical operational expenditures in DMBs include compensation for bank workers, including salaries, wages, bonuses, and perks, which constitute a substantial proportion of operational costs. Expenses associated with renting or leasing office spaces, branches, and other facilities are part of the operational costs for DMBs. Operating expenses include the expenditures related to utilities, such as power, water, and heating or cooling systems, at bank branches and offices.

Expenses related to the upkeep and enhancement of banking systems, software licensing, and technical infrastructure are crucial elements of operational costs. Operating expenditures are increased by the costs incurred in maintaining security measures, which include staff, surveillance systems, and security technology. DMBs may be subject to charges for professional services such as legal counsel, consultancy, and auditing, contributing to operational costs. The routine upkeep and necessary fixes of tangible assets, such as ATMs, buildings, and equipment, add to the operational expenses of banks.

2.6 Empirical Review and Hypotheses Development

A comprehensive investigation has been carried out on the nexus between the cashless banking system and the growth of DMBs in Nigeria. However, there is a significant lack of research that combines several elements to measure performance. Examples, Makinwa (2021), Okechukwu and Yua (2021), Akani and Obiosa (2020), Usman (2020), Akindayo, Shadera, and Solomon (2020),

Gambo (2020), Nwakoby, Chukwu, and Ogbenetega (2020), Ul-Hug and Hossain (2020), James and Eloho (2020), analyse the impact of a cashless policy on DMBs performance in Nigeria. Adu and Williams (2022) investigates the effects of cashless policies on the profitability of Nigeria DMBs. The objectives encompass examining the influence of ATM, NEFT, POS, and e-banking transactions. The research indicated that ATM, NIP, mobile banking, and cheque transactions significantly influenced the performance of the sampled DMBs. The report recommended banks to fund training for technical personnel overseas to acquire knowledge and stay current with new and innovative technology utilised in the banking industry. Adamu and Adaora (2023) examine the effect of inclusion initiatives on the performance of Nigeria's banking industry. Using an ex-post facto technique, the OLS model reveals that POS and ATM substantially impact system's efficiency and effectiveness. The research recommends, among other things, that the CBN should reduce electronic payment transaction rates to promote broader inclusion.

Charity, Victoria, Chima, and Udeoba (2024) explore the impact of ATMs and mobile banking on the performance of Nigerian DMBs. The analysis used data from the CBN Bulletin from 2009 to 2021. The findings indicates that ATMs have a significant impact on the performance of Nigerian DMBs. The study concluded that e-banking has enhanced banking access for users while also allowing banks to extend their operations to reach more people. Ajuonu and Uzodike (2024) investigate the impact of the Cashless Policy on the Accounting Performance of Some Selected DMBs in Nigeria. The ex-post facto research design was used, and the data were analysed using multiple regression analysis. The study discovered that ATM transactions substantially affected the ROE of DMBs in Nigeria. However, POS transactions significantly affect the NPM of selected DMBs. The study concluded that the volume of ATM and E-banking transactions substantially impacts Nigerian DMBs' revenues, as does the volume of POS transactions on client deposits. Prior research, including Agu and Agu (2020), Okafor (2020), Ignoroje and Okoroyibo (2020), Ogutu and Fatoki (2019), Agu and Nwakwo (2019), Itah and Ene (2014), and Abaenewe, Ogbulu, and Ndugbu (2013), has frequently employed metrics such as ROE, ROA, EPS, and NPAT. Nevertheless, there exist inconsistencies in their findings. Owing to these controversies in their findings, the study hypothesised that:

H_{01}: Online transactions policy does not significantly impact customers' deposits of listed Deposit Money Banks (DMBs) in Nigeria.

H_{02}: Online transactions policy does not significantly impact the operating expenses of the listed Deposit Money Banks (DMBs) in Nigeria.

3. RESEARCH METHOD

3.1 Research Design

The study used a mixed-methods research strategy, using an ex post facto approach. The ex post facto research design, or a retrospective or non-experimental research design, is an observational study where the researcher examines the relationship between variables without actively manipulating them. The study population comprises nineteen (19) listed commercial banks classified into national and international licensed banks on the Nigerian Exchange Group (NGX) as of 2021. Census sampling techniques were employed since the entire population was studied.

3.2 Sources of Data

Data was sourced via structured/closed-ended questionnaire and annual accounts and reports of the sampled firms. A five-point Likert-type scale was used to seek a response rate and reduce respondents' frustration level, as noted by Pondent (2017). In addition, a structured question is mostly recommended due to the desire to avoid a lacklustre response, which could result in common method bias (Dillman, Smyth & Christian, 2014). The data was analysed with the aid of SEM-PLS and panel regression techniques. The study covers 12 years, spanning from 2012 to 2023. The justification for selecting this time frame is based on the fact that the cashless system was introduced on January 1 2012, and since then, it has occupied a major policy applicable in the Nigerian banking sector.

3.3 Methods of Data Analysis

The study utilises both inferential and descriptive statistics for data analysis. The regression analysis was employed to analyse the quantitative data and further show the significance level of the variables, from which a stance was made on the failure to reject or reject the earlier formulated hypotheses. In addition, the study used a structural equation model, specifically Smart-PLS, to analyse the qualitative data and ascertain the research instrument's validity and reliability. These were undertaken after preliminary analyses, including missing values, nonresponse bias, common method bias, detection of outliers, and normality tests using SPSS version 27.

3.4 Instruments of Data Analysis

The instruments used in this study were adopted from past studies, with minor changes to suit the study. Firm performance was measured using operating expenses and customer deposits adopted from Spillan and Parnell (2006). The online transactions were measured using the adopted 7-item Adamson University Survey Questionnaire on Cashless Society (2018). A sample of a question

is “Online transactions are much more convenient". The reported Cronbach's alpha is 0.798, showing the instrument is reliable and adequate for the study.

3.5 Model Specification

The panel regression model to test the hypotheses was adopted from the study of Chikwemme and Nwadialor (2019). The models were specified as follows:

$FP = OT$…… (i)

Where the equation provided reads thus:

$FP = \beta_0+\beta_1 CIB_{it}+\beta_2 MBS_{it}+\beta_3 GPS_{it}+\beta_4 PDS_{it}+\beta_5 RMT_{it}+\varepsilon_{it}$ ……(ii)

$OE = \beta_0 + \beta_1 CIB_{it} + \beta_2 MBS_{it} + \beta_3 GPS_{it} + \beta_4 PDS_{it} + \beta_5 RMT_{it} + \varepsilon_{it}$ ….....(iii)

$CD = \beta_0 + \beta_1 CIB_{it} + \beta_2 MBS_{it} + \beta_3 GPS_{it} + \beta_4 PDS_{it} + \beta_5 RMT_{it} + \varepsilon_{it}$…….…….....(iv)

Where:

OT = Online Transactions
GPS = Global Pay System
CIB = Corporate Internet Banking
MBS = Mobile Banking System
PDS = Pay Direct System
RMT= Remita
FP = Financial Performance
CD = Customer Deposit
OE = Operating Expenses
β_1 - β_5 = The parameters to be estimated
i = Represents individual firms
t = Stands for time period
ε = The error term of the model

3.6 Variables Description and Measurement

This sub-section describes the study's various variables, which are made up of both dependent and independent variables, and how they are measured (proxies) as presented in Table 1.

Table 1: Variables’ Description and Measurement

Variables	Measurement	Prior Studies
Dependent Variables = Firms’ Performance		
Customers' Deposit (CD)	Log of total operating expenses of sampled DMBs	Hussein and Elyjoy (2018), Eminah (2022)
Operating Expenses (OE)	Log of customers' deposits	Emenike (2020)
Independent Variables: Cashless System		
Global Pay System (GPS)	Total volume of global pay transactions for DMBs	Very few studies have employed this variable to measure the cashless system.
Corporate Internet Banking (CIB)	Total volume of corporate internet banking transactions for DMBs	Ihpefan et al. (2018), Mustapha (2018), Oyomo (2018), and Okafor (2020).
Mobile Banking System (MBS)	Total volume of mobile banking transactions for DMBs	Ihpefan et al. (2018), Mustapha (2018), and Oyomo (2018).
Pay Direct System (PDS)	Total volume of direct pay transactions for DMBs	Ene (2020)
Remitta (RMT)	Total volume of Remitta transactions for DMBs	Ene (2020)

Source: Author’s Compilation (2024).

4. Data Presentation and Analysis

This sub-section mirrors data collected by administering questionnaires to respondents, and the computation is provided in Table 2.

Table 2: Questionnaire Distribution and Response Rate

Questionnaire	Frequency	Rate%
Distributed	422	100
Unreturned	5	1.2
Returned	417	98.8
Rejected	15	3.6
Retained	402	95.2

Source: Field Work (2024).

The distribution and response rate of the questionnaires for the study comprised 422 questionnaires, 417 of which (98.8%) were returned. Among the returned questionnaires, 15(3.6%) were rejected or removed. Consequently, 402(95.2%) were retained and deemed usable for analysis. This high response rate and retention of usable questionnaires indicate a robust sample size, enhancing the reliability and validity of the study's findings. This is in tandem with Ryu (2020) and Ojeleye, Abu-Abdissamad, Umar, and Usman (2022) assert that a consensus on a minimum acceptable response rate is lacking. Malhotra and Grover suggested that a 50% response rate is sufficient for data processing and presentation.

4.1 Analysis of Missing Values

Table 3 presents the analysis of the missing values.

Table 3: Computation of Missing Values

Latent Variables	No. of Missing Values
Global Payment System	6
Corporate Internet Banking	5
Mobile Banking System	7
Pay Direct System	5
Remita	3
Financial Performance	8
Total	34 out of 12,060 data points
Percentage of missing values: 0.28%	

Source: Researcher's Compilation (2024).

Note: The missing value percentage is derived by dividing the number of randomly missing values for the entire data set by the total number of data points multiplied by 100.

Table 3 shows that only 34(0.28%) data points from the initial data set were randomly missing. However, no "golden rule" exists for an acceptable percentage of missing values for valid statistical inference in a data set (Aliyu, 2020). Researchers have established that missing data of less than 5% for the sample and 10% for the variables are generally acceptable and agreeable to any imputation strategy (Hair et al., 2014). Since the missing data was less than 10%, the mean substitution imputation approach replaced the missing data. Furthermore, experts believe that mean substitution is the simplest technique for replacing missing data with a probability of less than 5% (Tabachnick & Fidell, 2012).

4.2 Normality Test

Studies (Wetzels, Odekerken-Schröder, & Van Oppen, 2009; along with Reinartz, Haenlein, & Henseler, 2009) have established that SEM-PLS functions effectively with non-normally distributed data. Similarly, Hair et al. (2019) posited that highly skewed data elevates bootstrap standard error, perhaps resulting in an underestimation of the statistical significance of route coefficients. Therefore, this study employed multivariate normality to analyse the data distribution by utilising Kurtosis and Skewness to assess normalcy. Table 4 presents the ratings for Skewness and Kurtosis of the research variables.

Table 4: Normality Test: Skewness and Kurtosis Statistics (n=412)

	N Stat.	Min.	Max.	Mean	Std. Dev	Skewness	Std. Error	Kurtosis	Std. Error
CIB	402	1.235	5.000	3.743	0.484	1.031	0.122	0.332	0.244
GPS	402	1.342	5.000	3.943	0.348	0.238	0.122	-1.363	0.244
MBS	402	0.987	4.958	3.854	0.389	0.680	0.122	-0.520	0.244
PDS	402	1.123	4.896	3.847	0.386	0.398	0.122	-1.014	0.244
FP	402	1.286	5.000	2.765	0.904	0.702	0.122	-0.725	0.244
RMT	402	1.243	5.000	2.515	0.612	0.322	0.122	-0.459	0.244

Source: SPSS Version 27, (2024).

Based on the analysis in Table 4, it is determined that the data is normal because the absolute values of Skewness and Kurtosis for all items in this research are within the permitted ranges of < 2 and < 7, respectively. Skewness levels of less than 2 and Kurtosis values of fewer than 7 are advocated (Curran & Blackburn, 2001). Kline (2016) contends that absolute Skewness values exceeding 3 and Kurtosis values surpassing 10 may indicate a concern, however values over 20 may denote a more serious issue.

4.3 Multicollinearity Test

Two (2) techniques are used in this work to detect multicollinearity. The correlation matrix of the exogenous latent constructs functioned as the initial approach. A correlation coefficient of 0.90 or above signifies multicollinearity among exogenous latent variables (Hair et al., 2019). Table 5 demonstrates that the correlations among all exogenous variables were beneath the threshold (i.e., r = 0.90). The correlation matrix demonstrates the lack of multicollinearity among these variables. Secondly, the researcher looked at all the exogenous latent constructs' tolerance levels and variance inflation factor (VIF) values.

Hair et al. (2014) and Field (2017) advocated that the commonly recognised level of multicollinearity of a VIF value ≤ 10 indicates no multicollinearity, but a value more than 10 indicates severe multicollinearity. While a tolerance level of ≥ 0.1 indicates no multicollinearity, a number less than 0.1 indicates substantial multicollinearity. However, Kock (2015) argued that the presence of VIF more than 3.3 and less than 0.303 tolerance level is a sign of pathological collinearity and common method bias.

Table 5: Correlation Matrix (n=402).

Construct	GPS	CIB	MBS	PDS	RMT
GPS	1				
CIB	.031	1			
MBS	.681**	0.021	1		
PDS	.485**	0.021	.732**	1	
RMT	.812**	0.000	.553**	.553**	1

Source: SPSS Version 27 (2024). **. Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows that multicollinearity is absent among the exogenous latent components since the VIF values are smaller than the 0.303 threshold Kock (2015) indicated. As a result, multicollinearity is not a concern in our investigation.

Table 6: Tolerance Level and Variance Inflation Factor (VIF) Values

		Collinearity Statistics	
Endogenous Variable	**Latent Constructs**	**Tolerance level**	**VIF**
FP	GPS	0.836	1.196
	CIB	0.996	1.004
	MBS	0.502	1.992
	PDS	0.389	2.574
	RMT	0.485	2.062

Source: SPSS Version 27 (2024).

Table 6 shows the VIF values for five latent constructs, assessing collinearity. A higher tolerance level (>0.2) and VIF values below 5 indicate low multicollinearity, suggesting reliable data for regression analysis. GPS (Tolerance: 0.836, VIF: 1.196) and CIB (Tolerance: 0.996, VIF: 1.004) have very low VIF values, indicating minimal multicollinearity.

4.4 Assessment of SEM-PLS Path Modelling

The statistical outcomes of the various analyses, such as the reliability of individual items assessing each latent concept, internal consistency, and discriminant validity, among other factors, were examined. Therefore, the PLS algorithm was used to assess individual item reliability and other measurement model criteria, with outer loadings indicating the reliability of reflective constructs. According to Hair et al. (2014), an outer loading of 0.70 is ideal for established scales, but items with loadings between 0.40 and 0.70 may be retained if leaving them improves the AVE and CR. Following Hulland's (1999) guideline, loadings below 0.5 should be excluded. Consequently, five items were removed, improving the AVE and CR, leaving the remaining items suitable for further analysis as shown in Figure 1 and Table 6.

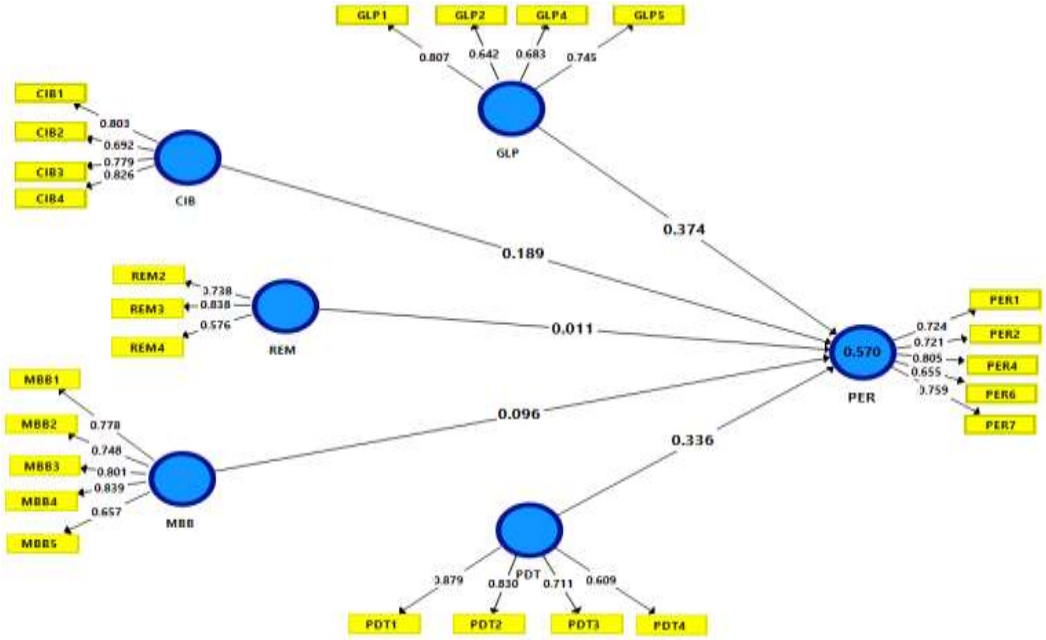

Figure 1: Measurement Model
Source: Smart PLS version 3.2.8 (2024).

Figure 1 and Table 6 collectively present the measurement model's assessment, showcasing the evaluation of both item reliability and the overall construct validity and reliability for the reflective constructs examined in the study. The indicator loadings for each construct met the minimum threshold for acceptability, indicating sufficient individual item reliability for most items. However, five items—FP3, FP5, FP8, GPS3, and RMT1—fell below the acceptable loading criteria and were removed to enhance the model's quality. Eliminating these items improved AVE and CR metrics, strengthening construct validity. The remaining items, all of which met or exceeded the required loading threshold, were deemed reliable and valid for continued analysis in the study. This refinement ensures that the measurement model aligns with established academic standards for reliability and validity, enabling more robust and accurate structural model evaluations in subsequent analyses.

Table 7: Item Loadings, Internal Consistency, and AVE.

Constructs	Indicators	Loadings	Cronbach's Alpha	Composite Reliability	AVE
Corporate Internet Banking	CIB1	0.803	0.781	0.858	0.603
	CIB2	0.692			
	CIB3	0.779			
	CIB4	0.826			
Global Pay System	GPS1	0.807	0.715	0.812	0.521
	GPS2	0.642			
	GPS4	0.683			
	GPS5	0.745			
Mobile Banking System	MBS1	0.778	0.827	0.877	0.588
	MBS2	0.748			
	MBS3	0.801			
	MBS4	0.839			
	MBS5	0.657			
Pay Direct System	PDS1	0.879	0.762	0.847	0.585
	PDS2	0.830			
	PDS3	0.711			
	PDS4	0.609			

Financial Performance	FP1	0.724	0.785	0.854	0.540
	FP2	0.721			
	FP4	0.805			
	FP6	0.655			
	FP7	0.759			
Remita	RMT2	0.738	0.705	0.765	0.526
	RMT3	0.838			
	RMT4	0.576			

Source: Researcher's Composition (2024).

4.5 Assessment of the Structural Model

This section presented the SEM for data analysis on direct and mediated relationships through bootstrap analysis. A typical bootstrapping method was employed, utilising 5000 bootstrap samples from 402 examples to examine the importance of the route coefficients in the direct relationship (Hair et al., 2014; Hair et al., 2021).

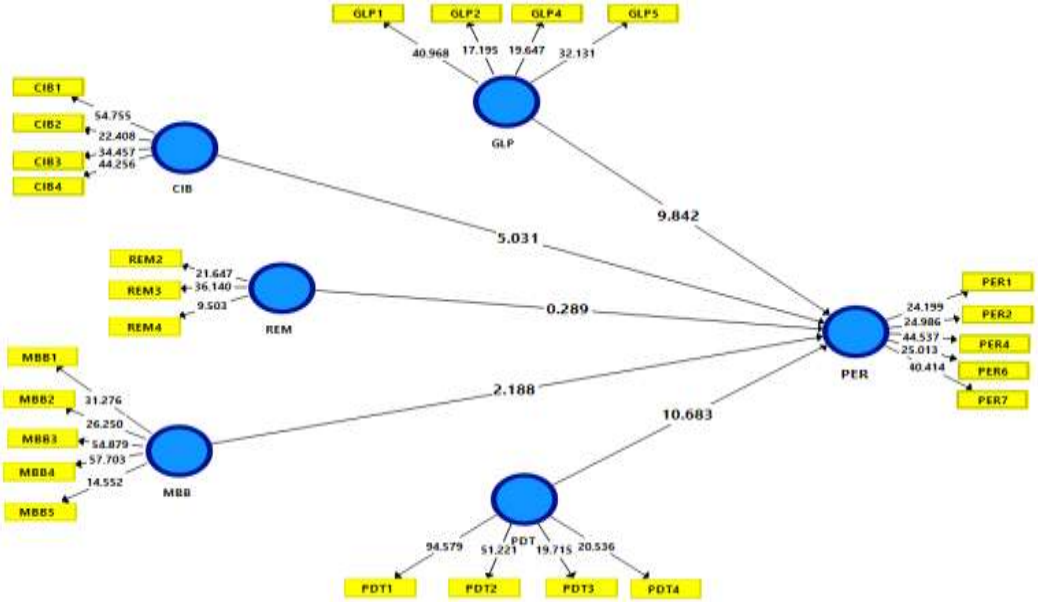

Figure 2: Structural Model

Source: SEM-PLS Version 3.2.8 (2024).

Table 8: Path Coefficient (Direct Effect)

Hypotheses	R.Ship	Beta	Std. Dev.	T Statistics	P Values	Decision
H_{01}	GPS -> FP	0.374	0.038	9.842	0.000	Rejected
H_{02}	CIB -> FP	0.189	0.037	5.031	0.000	Rejected
H_{03}	MBS -> FP	0.096	0.044	2.188	0.029	Rejected
H_{04}	PDS -> FP	0.336	0.031	10.683	0.000	Rejected
H_{05}	RMT -> FP	0.011	0.040	0.289	0.773	Accepted

Source: SPSS Version 27 (2024). ***p<0.01, **p<0.05.

Table 8 presents path coefficients representing the direct effects on licensed DMBs' performance in Nigeria. The first hypothesis (H_{01}) posits a relationship between Global Pay System (GPS) and financial performance (FP), with a beta coefficient of 0.374. The standard deviation (STDEV) associated with this coefficient is 0.038, yielding a T statistic of 9.842 and a p-value of 0.000 at a 1% ($p<0.01$) significance level. The null hypothesis is rejected, suggesting that GPS significantly influences the performance of License DMBs in Nigeria. The second hypothesis (H_{02}), which examines the association between Corporate Internet Banking (CIB) and FP, exhibits a beta coefficient of 0.189. The associated STDEV is 0.037, resulting in a T statistic of 5.031 and a p-value of 0.000. Consequently, H_{02} is rejected, indicating a significant impact of CIB on the FP of licensed DMBs in Nigeria.

The third hypothesis (H_{03}) focuses on the Mobile Banking System (MBS) and its effect on FP, revealing a coefficient of 0.096, a standard error of 0.044, a t-statistic of 2.188, and a p-value of 0.029. These figures indicate significance at the $p<0.05$ level.

Therefore, H_{03} is rejected, suggesting a significant nexus between MBS and the FP of licensed DMBs in Nigeria. Hypothesis four (H_{04}) explores the influence of the Pay-direct system (PDS) on FP, yielding a beta coefficient of 0.336. The associated STDEV is 0.031, resulting in a T statistic of 10.683 and a p-value of 0.000. With a significance level of $p<0.01$, H04 is rejected, indicating a significant impact of PDS on the performance of license DMBs in Nigeria. Hypothesis five (H_{05}) examines the relationship between remita (RMT) and FP, revealing a beta coefficient of 0.011. The STDEV associated with this coefficient is 0.040, yielding a T statistic of 0.289 and a p-value of 0.773, failing to reject the null hypothesis. This suggests that RMT does not significantly influence the financial performance of DMBs in Nigeria. Furthermore, the computation of the coefficient of determination (R^2) is presented in Table 9.

Table 9: Coefficient of Determination (R^2).

Construct	***R²***
Performance	0.570

Source: SPSS Version 27, (2024).

An R-square score of 0.570 signifies that roughly 57% of the variance in the dependent variable is elucidated by the independent variables incorporated in the model. In other words, factors such as Global Pay System and Corporate Internet Banking account for about 57% of the variability observed in the financial performance of licensed DMBs in Nigeria. Therefore, while the model provides valuable insights into the factors affecting DMBs' performance, it does not capture the entire complexity of the phenomenon. According to Chin's (1998) assertion, R2 values of 0.67, 0.33, and 0.19 should be regarded as substantial, moderate, and weak, respectively. The R2 value of 0.570, attributed to external latent variables affecting the target endogenous latent variable, is modest.

4.6 Assessment of Effect Size *(f^2)*

Effect size (f^2) provides a measure of how strong the relationship is between variables in a statistical analysis. It goes beyond just determining if the relationship is statistically significant, helping researchers understand the practical importance of their findings (Ojeleye et al., 2023). A larger effect size indicates a stronger relationship between variables, while a smaller one suggests a weaker connection. By considering effect size alongside significance testing, researchers can better assess the real-world significance of their results and understand the impact of independent variables on the dependent variable (Haie et al., 2010). Essentially, effect size helps researchers gauge the actual strength of relationships in their data, making their interpretations more meaningful and applicable to real-life situations. Thus, the computation of the effect size is achieved using Cohen's formula (Cohen, 1988; Hair et al., 2021) given as:

$$f^2 = \frac{R^2 \text{ Included} - R^2 \text{ Excluding}}{1 - R^2 \text{ Included}}$$

Where:

$f^2 =$ *the F-squared value that specifies the effect size of an exogenous variable's influence on an endogenous variable.*

$R^{2Included} =$ *is the R^2 value of the endogenous variable before omitting a particular exogenous construct.*

$R^{2excluded} =$ *represents the changes in the R^2 value of the endogenous variable after excluding a particular exogenous variable from a model.*

The f2 values of 0.02, 0.15, and 0.35 correspond to small, medium, and large effects, respectively (Cohen, 1988). In a manner akin to indirect relationship hypothesis testing, the alteration in R2 value upon the exclusion of a specific exogenous variable from the model serves to assess whether an omitted variable has a significant impact on the latent endogenous variable (Hair et al., 2014). Table 10 presents the results of the effect size analysis.

Table 10: Assessment of Effect Size (f^2)

Constructs	**FP**	**Effect Size**
CIB	0.047	Small
GPS	0.176	Medium
MBS	0.010	Small
PDS	0.220	Medium
RMT	0.000	Nill

Source: SEM-PLS Version 3.2.8 (2024).

Table 10 assesses the effect size (f^2) for various constructs in the analysis. The effect sizes indicate the magnitude of each construct's impact on the FP of license DMBs in Nigeria. CIB's effect size is 0.047, which is a small effect, suggesting a modest influence on

bank performance. GPS shows a larger effect size of 0.176, classified as a medium effect, indicating a more substantial impact on bank performance than CIB.

4.7 Predictive Relevance *(Q^2)*

Aside from assessing the degree of the R^2 value as a measure of predictive relevance, the Stone-Geisser Q2 value is critical (Garson, 2016). This criterion denotes a model's predictive significance (Hair et al., 2014). This criterion serves as an additional assessment of model fit in PLS-SEM analysis (Duarte & Raposo, 2010). The Q2 statistic reflects the extent to which observed values are accurately represented in the model and informs parameter estimations (Chin, 1998). The predictive relevance (Q2) of the exogenous latent variables on the reflective endogenous latent variable was evaluated using a cross-validated redundancy criterion (Hair et al., 2014). A model with a Q2 value exceeding zero is considered to possess predictive relevance or practical utility (Reinartz, Haenlein & Henseler, 2009). As a result, the higher the Q^2, the more predictive value the external latent factors have on the endogenous latent variable (Duarte & Raposo, 2010). Table 11 displays the Q^2 value acquired using the blindfolding process.

Table 11: Predictive Relevance(Q^2)

Constructs	SSO	SSE	Q^2 (=1-SSE/SSO)
CIB	2,056.000	2,056.000	
GPS	2,056.000	2,056.000	
MBS	2,570.000	2,570.000	
PDS	2,056.000	2,056.000	
FP	2,570.000	1,830.800	0.288
RMT	1,542.000	1,542.000	

Source: SPSS Version 27 (2024).

Depicted in Table 11 are the blindfolding outputs of the cross-validated redundancy (Q^2) of the endogenous latent variables of this model. It is glaring that Q^2 is more than zero (0.288) as shown in Table 11. It simply signifies the existence of a path model predictive relevance on the performance of a deposit money bank (Chin, 1998; Hair et al., 2014). Presented in Figure 3 is the diagrammatic illustration of the blindfolding output indicating the predictive relevance variable.

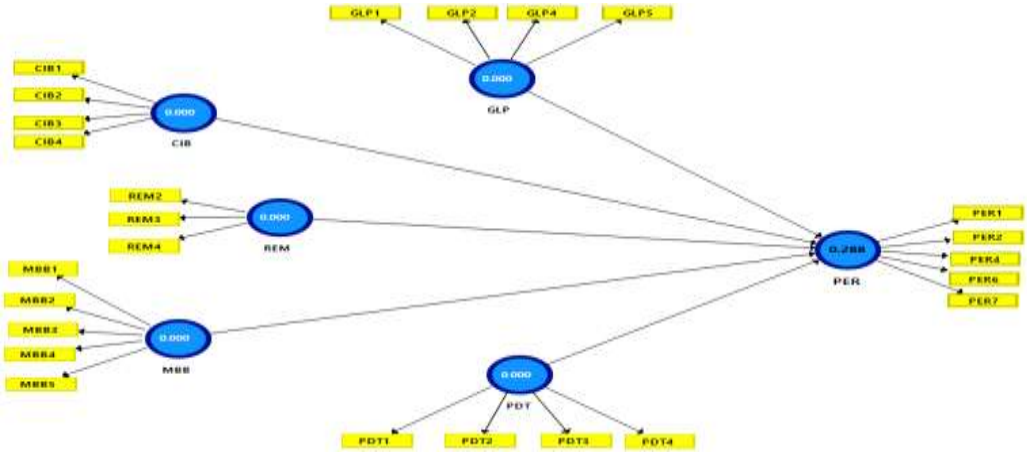

Figure 3: Predictive Relevance
Source: Smart PLS Version 3.2.8 (2024).

4.8 Presentation of Quantitative Analysis

This sub-section summarises the results of the various post-estimation tests conducted on secondary data. These tests include the fixed random effect test, the Hausman test to select the best-fitted model for the study, and the Breusch-Pagan-Langford test to determine the existence or absence of heteroscedasticity. Heteroscedasticity was discovered in all models, prompting a robust regression test. The fixed and random effects findings can be found in the appendices, whereas the results of the Hausman test, Breusch Pagan Lagrangean test, and robust regression test are shown and described here.

4.9 Model 1

The analysis of the regression models commences with the determination of the Hausman specification test, as shown in Table 12. The Hausman test is used to determine which model is best suited for the study between the FE and RE models. The role, therefore, is that a P-value of less than 0.05 (5%) indicates that the FE should be chosen over the RE.

Table 12: Hausman Specification Test

Chi2	16.920
Prob Chi2	0.005

Source: STATA Version 14 (2025).

Table 12 reveals a P-value of 0.005, and the Chi-square statistic of 16.920 indicates a significant difference between FE and RE estimates. The significant p-value indicates that the null hypothesis is rejected in favour of FE. This implies that the FE model better fits the data than the RE model. Furthermore, the Breusch-Pagan Lagrangian Multiplier (LM) test was computed to analyse the presence of homoscedasticity.

Table 13: Breusch-Pagan Lagrangian Test

Chi2	59.300
Prob Chi2	0.000

Source: STATA Version 14 (2025).

The LM test produced a Chi-square statistic of 59.300 with a p-value of 0.000, providing strong support against the null hypothesis of homoscedastic residuals and no panel-level effect. This finding shows high unobserved heterogeneity between entities, which supports adopting the FE model instead of the Pooled OLS estimator. Similarly, the Hausman test ($\chi^2 = 16.920$; $p = 0.005$) confirmed that the entity-specific effects are associated with the regressors, indicating that the FE model is the most suitable estimation strategy for the data. The results of the FE model with Robust Standard Errors are presented in Table 14.

Table 14: FE Regression (Robust) Results

Dependent Variables = CD			
Independent Variables	**Coeff.**	**Std. Error**	**P-value**
GPS	-0.213	0.205	0.322
CIB	-0.109	0.129	0.418
MBS	-0.472	0. 106	0.664
PDS	0.139	0.965	0.177
RMT	0.074	0.104	0.488
C	12.823	1.665	0.000

Source: STATA Version 14 (2025).

The results of the FE model with Robust Standard Errors as presented in Table 14 provide valuable insights into the relationship between several corporate Online transaction systems and customers' deposit (CD) of the Nigerian DMBs. The Table shows that online transactions do not significantly impact customers' deposits in the short run. This shows that the growing use of online platforms is associated with decreased corporate profitability. This could be due to initial integration expenses, transaction processing fees, or inefficiencies during the adoption period. It could also reflect the nature of the online transactions, which often have huge transaction volumes but potentially low profitability. Thus, while online transactions enable cashless and cross-border transactions, their short-term impact on businesses may be negative. These findings support the premise that shifting to a cashless economy may include short-term profitability trade-offs, with long-term gains only apparent with increased user adoption, regulatory support, and process improvement.

4.10 Model 2

The analysis commences with the computation of the Hausman specification test. Table 15 shows the results of the Hausman test. The Chi2 is 8.460 and the Prob Chi2 is 0.133. The relatively small Chi-squared value indicates insignificant differences between the FE and RE models. The p-value is the most significant indicator that evaluates the null hypothesis that the RE model is appropriate.

Table 15: Hausman Test

Chi2	8.460
Prob Chi2	0.133

Source: STATA Version 14 (2025).

The null hypothesis states that there is no substantial difference between FE and RE effects estimates. A p-value greater than 0.05 indicates no significant difference between the FE and RE effects models; hence, the RE model is accepted. In this situation, as shown in Table 15, the p-value of 0.133 suggests the null hypothesis cannot be rejected. Thus, the RE model is applicable for this investigation. The result of the LM test, which detects the presence of heteroskedasticity in a panel regression model, is presented in Table 16.

Table 16: Breusch-Pagan Lagrangian Test

Chi2	49.040
Prob Chi2	0.000

Source: STATA Version 14 (2025)

Heteroskedasticity occurs when the variance of the error terms varies between data points, resulting in inefficient estimates and skewed test results. This test aids in deciding if a RE model is acceptable in heteroskedasticity or if a simpler model (such as the pooled OLS model) is sufficient. The Chi-squared value of 49.040 determines whether heteroskedasticity exists in the model. The higher the Chi-squared statistic, the greater the likelihood of substantial heteroskedasticity. In this situation, 49.040 is a reasonably significant value, indicating a high likelihood of heteroskedasticity in the models. The p-value of 0.000 is exceedingly small, far below the standard significance level of 0.05. This low p-value indicates that the null hypothesis of no heteroskedasticity is rejected. The significant heteroskedasticity emphasises the significance of proper methods (e.g., robust standard errors). Table 17 shows the RE regression results for the link between ROA, a key indicator of the internet banking system in Nigeria.

Table 17: RE Regression (Robust) Results

Dependent Variables = OE			
Independent Variables	**Coefficient**	**Robust Std. Error**	**P-value**
GPS	-0.215	0.093	0.021
CIB	-0.012	0.102	0.909
RMT	0.096	0.139	0.487
CIB	-0.012	0.116	0.418
MBS	0.091	0.220	0.095
PDS	0.177	0.199	0.282
C	8.918	2.153	**0.000**

Source: STATA Version 14 (2025).

The regression was carried out with the Robust Standard Errors test to account for heteroskedasticity, as previously validated by the Breusch-Pagan test. The coefficient for OE is statistically significant at the 1% level, with a coefficient value of 8.918 and a p-value of 0.000. This implies that changes in the explanatory variables have a substantial and meaningful link with operating expenses. This shows that the model gives useful information, even though not all individual components have substantial effects.

Global Pay System (GPS) with a negative coefficient of -0.215 and probability value of 0.021, exert a statistically significant effect on the operating expenses of listed DMBs in Nigeria. This result suggests that increasing the use or acceptance of GPAY results in a reduction in operating expenses. This finding is both economically and statistically significant, implying that GPAY could assist in streamlining payment procedures, eliminating human handling, and lowering transaction costs within the institution.

Mobile Banking System (MBS) shows a coefficient value of 0.091 with a p-value of 0.095. The P-value indicates that mobile banking, a significant driver of online transactions, significantly impacts the operating expenses of the sampled DMBs. This could be attributed to infrastructure hurdles, excessive transaction costs, or a lack of corporate integration.

4.11 Discussions of Findings

The study finds that the influence of online transactions on banks' operating expenses demonstrates a significant difference in insights given by qualitative and quantitative data. This mismatch in empirical evidence provides fertile ground for Implications, theoretical reflection, and practical policy considerations. The FE model with Robust Standard Errors reveals that online transactions do not significantly influence customers' deposits in Nigeria. However, the SEM-PLS results indicated that the cashless policy significantly influences customers' deposits of licensed DMBs. This finding could indicate a positive user experience, greater digital literacy, and institutional enthusiasm for digital transformation in Nigerian banking.

These findings align with the researches by Afolabi and Oluwole (2021), Johnson and Kim (2022), Khan and Ali (2022), Usman and Adeyemi (2021), Singh and Sharma (2020), who found that digital payment systems like Global Pay significantly improve

customers deposit, operational efficiency and performance by streamlining transactions and reducing costs as well as increasing transaction speed and accuracy. Conversely, this contradicts the findings of Rodriguez and Lopez (2021) and Choudhury and Nandi (2022), who argue that online transactions are associated with high implementation and maintenance costs and security concerns.
The regression results further show that the global pay and mobile banking systems significantly influence the operating expenses of the sampled DMBs in Nigeria. Similarly, the PLS-SEM models observed that the online transactions influence the operating expenses of the licensed DMBs in Nigeria. These findings are consistent with Ajayi and Ojo (2019) and Ekanem (2021), who found that adopting digital payment platforms does not always result in improved outcomes for firms, especially when usage inefficiencies, infrastructural deficits, or user inertia are present. On the other hand, Johnson and Kim (2022) and Khan and Ali (2022) contradict, who demonstrated that DMBs provide customers with convenient access to banking services and reduce the need for physical branches, thereby cutting costs and improving profit margins, leading to higher customer satisfaction and increased transaction volumes. In contrast, Choudhury and Nandi (2022) and Rodriguez and Lopez (2021) provide a differing perspective, suggesting that while mobile banking has potential benefits, the actual impact on performance can be limited by issues such as cybersecurity threats, customer trust concerns, and the digital divide. They argued that, in some contexts, these challenges may overshadow the advantages, leading to less pronounced improvements in performance metrics.

5.1 Conclusions

The study empirically investigates the influence of online transactions on firms' operating expenses and customers' deposits in Nigeria. Therefore, this paper concludes that stakeholders, such as bank employees, perceive GPS as a highly useful instrument for increasing performance, most likely because of its speed, efficiency, and convenience in making real-time payments. Similarly, the mobile banking system was viewed as beneficial for government payments and collections, reducing physical cash handling and improving process transparency.
The study concludes that stakeholders opined that online transactions are crucial drivers of cashless banking policy, better customer service, and competitive advantage. This implies that, while a cashless policy increases operating expenditures, it also increases customers' deposits. Certainly, cashless policy is well received, but results are determined by usage volume, transaction fees, and integration, which differ by bank.

5.2 Recommendations

The study finds that the online transactions correlate with the banks' operating expenses and customers' deposits. The study therefore recommends integrating digital technologies like GPS and customers' deposits. Linking online transactions to lending processes, investment opportunities, and cross-selling strategies will ensure digital advances directly impact customers' deposits, reduce operating expenses and ultimately propel revenue growth and shareholder return. The study further recommends management of listed DMBs and regulatory agencies, such as CBN and NDIC, to emphasise the benefits, security, and accessibility of online transactions in Nigeria. Similarly, management should prioritise infrastructure upgrades such as dependable network systems, improved cybersecurity, and scalable cloud platforms.

5.3 Implications of the Findings

The findings from this study reveal critical implications for banking policy, operational strategy, and digital transformation initiatives within the Nigerian sector. Consequently, the mixed results across various performance indicators imply that banks should avoid a one-size-fits-all digital strategy. Instead, they should tailor digital tools to specific performance objectives such as deposit mobilisation, cost efficiency, or profitability. The relatively favourable primary data outcomes indicate that customers and bank staff recognise the potential of online transactions. However, unlocking that potential requires addressing usability challenges, ensuring service reliability, and building trust.

REFERENCES

1) Abaenewe, Z.C., Ogbulu, O.M. & Ndugbu, H.O. (2013). Electronic banking and bank performance in Nigeria. *West African Journal of Industrial & Academic Research, 6(1).*
2) Afolabi, O., & Oluwole, A. (2021). Adoption of advanced payment technologies and bank performance in Nigeria. African Journal of Banking and Finance, 15(1), 34–50. https://doi.org/10.5678/ajbf.v15i1.2021
3) Agu A.O, Agu S.V (2020). Cashless system and the Nigerian economy: A disaggregated approach. *International Journal of Humanities, Social Sciences and Education,* 7(4).
4) Ajayi, S. I. & Ojo, O. O. (2016). Money and banking: Analysis and policy in the Nigerian context. Ibadan Daily Graphics.
5) Akani, E. N., & Ordu, C. N. (2022). Effects of Conditions on Return on Equity of Deposit Money Banks in Nigeria. Nigerian Journal of Management Sciences, 23(2), 419-420
6) Akhalumeh. P. B. & Ohiokha, F. (2012) Nigeria's cashless economy: the imperatives, *International Journal of Management and Business Studies*, 2(2) 31–36.

7) Akintayo, D.I, Shadere, O.A & Solomon, O.T (2020). Impact of the Cashless System on Organisational Performance in NCC. *Islamic University Multidisciplinary Journal* 7(2)
8) Aliyu, M. S. (2020). Determinants of entrepreneurial success among women in north-western Nigeria. *Bayero University, Kano.* 2(5).
9) Charity, I.O., Victoria, O.B., Chima, K.A., & Udeoba, C.E. (2024). Effect of Electronic Banking on the Performance of Deposit Money Banks in Nigeria. *ANAN Journal of Accounting, 13(1): 48–66. DOI: https://doi.org/ 10.70518/ajoa. v13i1.03*
10) Datta, R. K. (2021). Relationship between Cashless Banking and Bank's Profitability in Bangladesh. *International Journal of Science and Business, 5, 21-32.*
11) Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). Internet, Phone, Mail and Mixed-Mode Surveys: The Tailored Design Method (4th ed.). Hoboken, New Jersey: John Wiley & Sons, Inc.
12) Ekanem, R.E, Adeniyi, K.J. & Adeogun, G.F. (2017). Effect of agency banking on performance of commercial banks in Nigeria: A study of four commercial banks in Rwanda. European Journal of Business and Social Sciences, 5(01), 181-201
13) Gbanador, M. A. (2021). *The effect of cashless policy on economic growth in Nigeria: An autoregressive distributed lag approach. Asian Journal of Economics, Business and Accounting, 23*(6), 22–31.
14) Groves, R. M. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public Opinion Quarterly*, 70(5)
15) Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th ed.). Hampshire: Cengage Learning EMEA.
16) Ignoroje EK, Okoroyibo EE. (2020). Cashless policy and the performance of deposit money banks in Nigeria. *European Journal of Accounting, Auditing and Finance Research. 2020; 8(5):85-104*
17) Ikpefan, O. A., Akpan, E. S., Godswill, A. O., Grace, E., & Chisom, N. (2018). *Electronic banking and cashless policy in Nigeria*. *International Journal of Civil Engineering and Technology, 9*(10), 718–731.
18) Itah A. J. & Ene E. E. (2014). Impact of cashless banking on banks' profitability: Evidence from Nigeria. *Asian Journal of Finance & Accounting*, 6(2).
19) James, I.E., & Eloho, O.E. Cashless system and the Performance of Deposit Money Banks in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 8(5). 85–104.
20) Johnson, R., & Kim, S. (2022). Corporate Internet Banking and competitive advantage in Asian banks. International Journal of Bank Marketing, 40(3), 223–240. https://doi.org/10.7890/ijbm.v40i3.2022
21) Khan, M., & Ali, S. (2022). Mobile banking and inclusion in South Asia. South Asian Journal of Finance and Banking, 10(2), 90–108. https://doi.org/10.3456/sajfb.v10i2.2022
22) Kline, R. B. (2016). *Principles and Practice of Structural Equation Modelling* (4th ed.). New York: The Guilford Press.
23) Morufu, O. (2016). E-payments adoption and profitability performance of deposit money banks in Nigeria. *International Journal of Information Technology*, 4(3).
24) Moudud-Ul-Huq, S., & Hossain, S. A. (2020). Impact of Cashless Policy on Bank's Profitability: Evidence from a Developing Economy. *International Journal of Engineering, 7, Article ID: 2050034.*
25) Muotolu, P. C., & Nwadialor, E. O. (2019). *Cashless policy and performance of deposit money banks in Nigeria. International Journal of Trend in Scientific Research and Development, 3*(4), 465–476.
26) Nwakoby, C, Chukwu, K.O., & Oghenetega, E.O. (2020). Effect of Cashless System on Deposit Money Banks' Profitability in Nigeria. *Asian Journal of Economics, Business and Accounting*, 19(4).
27) Okafor, C.A (2020). Cashless system for business purposes and the performance of deposit money banks in Nigeria. *International Journal of Innovative Finance and Economics Research*, 8(3).
28) Okechukwu, A. & Yua, H (2021). Effect of Products on the Performance of Selected Deposit Money Banks in Nigeria. *European Journal of Accounting, Auditing and Finance Research,* 9(1).
29) Rodriguez, P., & Lopez, M. (2021). Challenges in implementing digital payments in developing economies. Journal of Emerging Economy Finance, 8(4), 77–95. https://doi.org/10.2345/jeef.v8i4.2021
30) Singh, A., & Sharma, B. (2020). Digital payment systems and bank efficiency in South Asia: The impact of Global Pay. Journal of Technology in Emerging Markets, 12(2), 145–162. https://doi.org/10.1234/jftem.v12i2.2020
31) Spillan, J., & Parnell, J. (2016). Marketing resources and firm performance among SMEs. *European Management Journal*, *24*(2)
32) Usman, M. & Adeyemi, F. (2021). Remittance platforms and public finance management in Nigeria. Nigerian Journal of Public Finance, 9(2), 60–78. https://doi.org/10.1016/njpf.v9i2.2021