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APPLICABILITY SYNERGY OF FINANCIAL TECHNOLOGY AND BANK PERFORMANCE.

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Abstract

The study examined the predictive power of disruptive financial technologies, in the form of big data, artificial intelligence, block chain technology, web payment methods, point of sales and automated teller machine channels. The overriding objective was to evaluate how these financial innovation technologies have impacted returns on equity and returns on assets of quoted commercial banks. Performance of banks have been viewed to have sluggishly dwindled over the years and innovative technologies have been found to significantly improve performance in other sectors of the economy. Banks' performance could be significantly and positively improved with the use of innovative financial technologies. The study adopted the illustrative non – experimental descriptive research design for the 22 quoted Nigerian deposit money banks, detailed in the Nigerian Exchange Group (NXG) for 2012 to 2022, acquired from the Central Bank of Nigeria. The study excluded observations with insufficient data for the measurement of variables, while the analysis was performed using e-views, version 10. The result revealed that all the five disruptive financial technology innovations studied had positive and significant predictive influence on returns on equity and returns on assets of quoted commercial banks in Nigeria. The study thus recommended that that banks should amplify the adoption of financial disruptive technologies in their operations for better synergized results.

Keywords: Financial innovations; banks' ROE; banks' ROA; big data technology; block chain technology; machine learning; artificial financial intelligence; disruptive financial technology

1.0 Introduction

Over the last years, financial intermediation has evolved considerably, owing to technological advancements in telecommunications, information technology, and economic practices. Financial innovations have resulted from technology advancements, which have changed numerous financial commodities, services, manufacturing processes, and management structures. To the degree that these financial innovations decrease costs and risks, financial innovations equally significantly enhance social welfare services. Several financial innovations, of course, fail due to fundamental design faults or superseded by superior alternatives.

The ongoing transition from depending on human judgment to computerized analysis of customers' data (big data) and the use of artificial intelligence, machine learning, and block chain are excellent examples of technological developments that have dramatically changed the financial services sector. This has carried what had been primarily local markets for banking services and exposed them to countrywide contests from several other banks and nonbank financial firms. For example, credit scoring methods based on extensive prior credit registry databases are frequently used to analyse retail loan applications. Central payment systems have enhanced the efficiency and speed of fund transfer at lower costs. Blockchain ledgers have enhanced clients' identity verification, making it easy to deliver a broad range of banking services without the need to re-verify the client's identity. The current approach eliminates the need to have a local presence to make a payment, apply for a loan, or use other banking services, which substantially reduces

operating, underwriting, and compliance costs, improves bank risk measurement and management and enhances their profitability and efficiency.

The adoption of disruptive technology and financial innovations by organizations (especially banking firms) has spawned a greater interest in researchers and practitioners whose aim is to provide the observed effects of such adoption on organizational performance. This paper unravels the empirical results that financial and technological innovation adoptions have on the performance of banks in the financial service sector; since banks are among the early adopters of information and communication technologies associated with service transformation and quality service delivery. Current technological changes in the financial industry are disruptive because they have entirely changed how traditional banking system operates, with new opportunities and challenges for adoption. Commercial banks must innovate in goods, services, and delivery methods due to competition and rapid developments in information technology. Due to rising consumer demand and the fear of surrendering market share, commercial banks invest massively in banking technology. ATM, telephone banking, online banking, and e-money are among the fundamental changes influencing distribution systems that impact financial performance seamlessly, according to Humphrey, Willesson, Bergendahl and Lindblon, (2006).

Financial innovation is described as a process of developing and propagating new financial instruments, technology, markets, and organizations. Product innovations are characterized by new financial instruments, whereas process innovations constitute inventive methods of disseminating financial products and pricing transactions (Lerner & Tufano, 2011). New goods, new manufacturing methods, new services, and new organizational structures are examples of financial innovation. According to Schumpeter (1934), firms can effectively introduce new goods, processes, and services to replace existing industries and markets. As a result, the capacity of financial institutions to sustain and thrive in the long run is contingent on their ability to innovate (Nofie,2011).

Firms with the ability to innovate will respond to innovation problems quicker and exploit new products and market possibilities better than non-innovative companies in terms of financial success. This means that companies with inventive strategic skills will outperform companies without such capabilities in terms of financial performance. Financial performance evaluates how well a company is yielding value for the shareholders. It may be assessed using a variety of economic indicators such as profit after tax, return on assets (ROA), return on equity (ROE), return on investment (ROI), earning per share, and any other widely recognized market value ratio (Ahmed, Raza, Amjad & Akram 2011).

Despite the evident significance of financial innovation in describing banking performance, the influence of fintech innovation on economic performance remains unclear for a variety of reasons. There appears to be a shortage of awareness regarding the drivers of innovation and the effect of innovation on financial success. There is also a gap in the literature emanating from the lack of empirical studies that provide a quantitative assessment of the relationship between disruptive technology, financial innovation and bank performance. The study fills the gap by delivering quantitative empirical evidence of how disruptive financial technological innovations (products

and services) affect bank's financial performance, specifically, returns on assets and returns on equity. This study, therefore, examines the effect of financial technology (fintech) innovation on the performance of banks listed on the Nigerian Exchange Group (NXG). The study examined the effect of innovations in ATM, POS, Web pay, block chain technology, artificial intelligence and big data on ROA and ROE of listed commercial banks.

2.1 Theoretical perspective

The research was based on E.M. Rogers' Innovation Diffusion Theory, which he developed in 1962. The theory arose from explaining how an idea may gain traction over time and propagate within a given community. Diffusion of the invention may thus be defined as the process by which an innovation spreads over time and frequently through specific channels among members of a social system. This theory describes how companies throughout the industry embrace new ideas. According to Rogers (2003), this theory is built on four key elements: invention, time, communication channels, and the impacts of the specific innovation on the social system. According to Abake (2017), innovations are more likely to be embraced by an entity if they are compatible with the entity's values. The banking industry, in particular, is characterized by shifting consumer demands and the requirement for rapid service delivery. As a result, the hypothesis explains why electronic money transfers and mobile banking have grown widely in the banking sector. Electronic money transfer allows customers to conduct transactions without having to visit a bank physically. On the other hand, mobile banking is quick and includes transferring mobile technology from the telecommunications industry to the banking sector.

2.2 Disruptive financial technology

Developments in telecommunications and information technology have transformed traditional banks from providing financial intermediation to more wide-ranging economic activities. Specifically, current disruptive technologies in telecommunications and data processing have stimulated innovations in banks' financial products, services, and processes. These products and services include retail loan applications (evaluated using credit scoring tools, which enhances transparency in credit underwriting and facilitates retail credit through securitization); statistically based risk measurement tools, which manage credit risks and interest rate risks across different portfolios, as well as value-at-risk tools which are used to measure the appropriate apportionment of capital for dynamically controlled portfolios (Hale & Lopez, 2019)

Volumes of data are transmitted by financial firms, which in turn use big data applied via different predictive analyses to monitor various spending patterns to ascertain the financial products to offer and verify the condition and character of customers. Financial organizations use data to make decisions related to trade, investment, investigation of anomalies, and risk analysis (Abake, 2017). Shen and Chen (2018) added that big data provide valuable information for improving customer satisfaction and overall banking operations. Hale and Lopez (2019) also pointed out that big data enhance financial transparency in the banking systems and uses customers' data to drive product, service, and process innovations, support decision-making, transform organizational culture, analyse risk, algorithmic trading, and improving performance. Abake (2017) also asserts that big

data using customer data analytics fosters sales growth, build customer relationship, and offers varied opportunities for firms by helping firms to respond to market demands.

Artificial intelligence (AI) and machine learning (ML) represent another disruptive technology with significant implications for banking firms. Abake (2017) defines AI as developed computer systems that perform human-intelligence tasks, usually facilitated by a combination of faster computers, digitized data, and better algorithms. Thus, humans teach machines, and machines learn from data (machine learning). AI and ML as general-purpose technologies are helpful in refining and improving risk management tools, detecting irregularities in asset valuation, and providing compliance with regulatory requirements, often referred to as "RegTech" (Wall, 2020). Wall (2020) further adds that AI and ML have the potential of improving a firm's productivity at reduced cost and risk by speedily scanning and making decisions based on data availability. AI and ML provide credit monitoring and risk mitigation for firms and also serve as personal financial management and a Robo-advising tool for individuals.

Another major disruptive technology that is currently changing the banking landscape is blockchain technology. Nakamoto (2008), in his paper, used blockchain technology to design a 'peer-to-peer electronic cash payment' that did not pass through any financial intermediary, which has now flickered a diversity of initiatives, intended to either replace financial intermediaries such as commercial banks or improve their efficiency (Mohamud & Mungai, 2019). In blockchain technology, data are added to the ledger (that cannot be manipulated), ordered by time, linked to each other using cryptology, and shared across a network (database). Since it is difficult for data on blockchain ledgers to be tampered with, banks worldwide have invested in tapping into this new technology to process payments and issue digital currencies to their customers (Abake, 2017). This tech allows banks to assess cross-border transactions faster, more efficiently, not requiring third-party authorization, and less expensive, with a remittance fee of about 2-3% of the total amount transferred, compared with the 5-20% taken by traditional intermediaries. He posits that the adoption of the world pay B2B payment system as a blockchain enhances the efficiency of banking operations.

Online financial transactions, which were not possible without identity verification, are now potential with blockchain technology, which provides financial firms the opportunity of securely re-using the identity verification of a customer already captured to complete all financial transactions. This secures re-use of customer identification found in blockchain distributed ledgers and database enhances the ease, transparency, and efficiency of syndicated lending and crowd funding (Parameshwar, Sruthie, Cisse, Kumar & Misra 2019). Thus, blockchain technology shifts financial firms' operational boundaries and is particularly useful for the transformation of financial transaction processes, creating unique financial products, and delivering novel financial services (Tahir, Shah & Ahmed., 2018).

2.3 Financial technology in product, process, and service innovations

Asante, Owen and Williamson (2014) assert that financial innovation involves producing and implementing new financial products, services, processes, tools, instruments, transaction techniques, and business models, including applying existing ideas in new markets in the financial

world. This assertion was expanded by Awrey (2016). They posit that financial innovations fill gaps in existing financial products and services available to consumers and correct information asymmetry among contracting parties in a financial transaction. Abeka (2017) added that financial innovation diminishes market resistance by reducing the costs of transacting equity shares in non-public companies, breaking trade barriers, assembling customers in economies of scale manner, and providing an innovative way of interacting with potential consumers or retailers.

Since the chief objective of the financial system is the facilitation of apportionment and distribution of economic resources among different monetary units, technological innovations related to new and improved financial products, services, and processes implemented to meet the demands of customers while reducing the risk and costs of financial operations will enhance the efficient attainment of this goal. Thus, financial innovation refers to new or improved products, services, processes, and instruments that meet customers' demands at lower costs and risks. These financial innovations include recent credit scoring, central pay, E-pay, web pay, mobile wallets and pay, retail banking service, POS, online banking, retail payment, amongst others (Hayashi, 2016).

Over the years, banking practices in Nigeria have been undeveloped and operations designed in the form of armchair bricks and mortar, with customers spending all day in the banking hall to make deposits or withdrawals, which still ends up unsuccessful in most cases (Okoye, Omankhanlen, Okoh, Ezeji & Achugamonu, 2019). However, in recent years, the advent of technology has revamped banking operations with broader client reach, facilitating more significant sales revenue for banking firms. Bank customers can perform financial transactions from their mobile phones and computer systems in the comfort of their homes and other remote places without the need to drive to banking halls. Consequently, service delivery has been improved, and bank processes and operations efficiently executed at low cost and risk (Agbolade, 2011; Okoye et al., 2019).

2.4 Financial performance

Lin (2008) described financial performance as the measure of an organization's success in achieving its objectives. According to Bessler (2008), it evaluates how a company uses its assets to generate revenue. The expression of earnings concerning resources is referred to as financial performance. Some economic indicators include total sales revenue, earnings, and return on assets. People can use financial and non-financial metrics to assess performance. It might consist of metrics like profit after tax, market share, and customer satisfaction.

Commercial banks can assess their success in various ways, notably through total revenue, customer satisfaction, and market share. Two financial performance indicators are considered in this study. These include returns on equity and returns on assets. Returns on equity (ROE) is among the most commonly utilized profitability ratios in the banking industry. The banking sector has employed ROE in the distribution of capital within and among divisions, according to Hale and Lopez, (2019). According to the study, ROE is a fundamental performance indicator in banking, and the ratio is chosen as a consequence of the risk management approach to banking. The term "returns on assets" (ROA) refers to the profits generated by a company's assets. ROA is a metric

that evaluates a company's ability to generate profits from assets even when those assets are not financed (Oira & Kibati, 2016). The net income for a year is divided by the average assets for the year to get returns on assets (ROA).

2.5 Empirical review

From 2015 to 2018, Okoye, et al. (2019) investigated the effects of financial innovation on bank profitability performance in Africa using electronic banking services. The study's dynamic panel data technique was used, and GMM estimated through a panel data regression model. Both ROA and ROE consistently showed significant persistence, according to the data. The findings also revealed that, except for POS terminals and online banking, bank cards and ATMs positively impacted banks' financial success. Furthermore, the profitability of banks in most African emerging nations has a significant impact on the proportion of ATMs to branch locations.

Between 2010 and 2017, El-Chaarani and El-Abiad (2018) investigated the influence of technological innovation variables on the performance of Lebanese banks over eight years. Returns on assets (ROA) and return on equity (ROE) were used as proxies to assess performance levels in the study. Internet banking, mobile banking, automated teller machines, and computer software investment were among the technical innovation drivers. Investment in automated teller machines (ATMs) and internet banking had a substantial beneficial influence on the performance of Lebanese banks, according to the data. The findings also indicated that mobile banking and computer software investments had no considerable effect on the performance of Lebanese banks.

Ndwiga and Maina (2018) investigated the impact of product and process innovations on the financial performance of Kenya's publicly traded commercial banks. Data were gathered using Qualtrics Survey Software, which was used to distribute online surveys to the participants. To evaluate the association between the variables, the collected data were examined using multiple linear regression. According to the data, process innovation had a substantial beneficial impact on the financial performance of publicly traded commercial banks. Nonetheless, there was no link between product innovation and financial performance.

In Kajiado County, Nekesa and Olweny (2018) studied the impact of financial innovation on the financial performance of deposit-taking SACCOs. The research looked at the effects of the product, process, and organizational changes on deposit-taking SACCOs' financial performance. Data were obtained from 36 participants from two SACCOs using a descriptive research approach. The researchers used annual reports, libraries, and the SACCO database to gather secondary data. To determine the connection between the variables, data were examined employing multiple linear regression. The researchers determined that product, process, and organizational improvements significantly impacted deposit-taking SACCOs' financial performance. The study found that financial innovation has a substantial impact on the financial performance of deposit-taking SACCOs in Kajiado County.

From 2006 to 2014, Shen and Chen (2018) investigated the link between financial innovation and bank efficiency and the influence of financial innovation on deposit money bank efficiency ratios in Nigeria. The Central Bank of Nigeria statistical bulletin was used to gather data for the research period. The unit root test was employed to confirm that the variables were free of stationarity

flaws, which are common in nearly all-time series data due to the nature of their generation. To assess the correlation between the variables, a multiple regression model was employed and evaluated. The value of transactions on Automated Teller Machines (ATMs) and Points of Sale (POS) were shown to be adversely associated with the efficiency ratio. In contrast, web/internet and mobile banking were favourably related, with only web/internet being substantially related. According to the granger impact evaluation, financial innovation products, as measured by the value of transactions on ATMs, the web/internet, POS, and mobile banking, had no substantial influence on deposit money banks' efficiency ratios in Nigeria. The study did find evidence, though, that banks' efficiency ratio had a statistically considerable effect on the value of ATM transactions.

3.0 METHODOLOGY

This study adopted illustrative non – experimental descriptive research design to investigate the relationship between financial technology and banks' financial performance. Descriptive research aims to find causal connections between variables (Saunders, Lewis & Thornhill., 2009; Robson 2002). An illustrative non-experimental research approach, according to Oira and Kibati (2016), is functional when the researcher is seeking to explain how a phenomenon works by finding the underlying non-manipulated elements that cause change.

This study utilized Nigerian deposit money banks' data detailed in the Nigerian Exchange Group (NXG) for 2012 to 2022, acquired from the Central Bank of Nigeria. The study excluded observations with insufficient data for the measurement of variables from the analysis, for the sake of accuracy. The analysis was performed using E-views, version 10.

The models specified for the study include:

$$ROA = \beta0 + \beta1ATM + \beta2POS + \beta3WPAY + \beta4BCT + \beta5AI + \beta6BD + \varepsilon t \quad (1)$$

$$ROE = \beta0 + \beta1ATM + \beta2POS + \beta3WPAY + \beta4BCT + \beta5AI + \beta6BD + \varepsilon t \quad (2)$$

Where:

ROA = Returns on Assets

ROE = Returns on Equity

ATM = Automated Teller machine transactions

POS = Point of Sales transactions

WPAY = Web Pay transactions

BCT = Block Chain Technology

AI = Artificial Intelligence

BD = Big Data

4.0 RESULTS

4.1 Descriptive Statistics

Table 1: Descriptive (Summary) statistics

	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation	Skewness	Kurtosis Statistic
ROA	0.080	7.53	3.54	2.27	-0.036	-1.012

ROE	0.11	114.29	44.59	32.90	0.591	-0.3017
BCT	1156533	338720999	54962493.68	80504419.56	2.768	8.736
AI	0	1145785229	232050965.26	284986289.94	2.196	5.539
BD	0	31034624	12202035.11	13808566.27	0.449	-1.831
ATM	60133610.47	875519307	360147503.81	244674372.81	1.175	0.318
POS	918256	438614182	92083056.21	110052404.45	2.149	5.163
Web Pay	1601086	103497007	19825657.68	24030087.79	2.612	8.184

Table 1 presents the descriptive summary for the variables, return on assets (ROA), return on equity (ROE), BCT, A.I, BD, ATM, POS, WEB PAY.

From the results, the average returns on asset was 3.54 with a minimum value of 0.080, the maximum value of 7.53, and a standard deviation of 2.27. These findings indicate that, on average, commercial banks in Nigeria had a high return on assets with deviation widely spread from the mean. The skewness value of -0.036 with a kurtosis value of -1.012 indicating that the data were negatively skewed with a platykurtic (tailed) distribution. The range and variance statistics showed the spread of ROA.

While an average return on equity was 44.59 with a minimum of 0.11 and a maximum of 114.29, having a standard deviation of 32.9. This implies an average ROE on commercial banks in Nigeria indicating a high return on equity with a deviation extremely high spread from the mean. The skewness value of 0.591, and a kurtosis value of -0.307, suggest that the data were positively skewed with a platykurtic (tailed) distribution. The variance and range statistics indicate the spread of ROE.

From the findings, the average Block Chain technology transaction was 54962493.68 with a minimum value of 1156533, a maximum weight of 338720999, and a standard deviation of 80504419.562. These findings indicate on average that commercial banks in Nigeria had high Block Chain technology transactions with deviation widely spread from the mean. The skewness value of 2.768 with a kurtosis value of 8.736 indicates that the data were positively skewed with a leptokurtic (peaked) distribution. The range and variance statistics show the spread of Block Chain technology transactions.

From the findings, the average Artificial Intelligence transaction was 232050965 with a minimum value of 0, a maximum weight of 1145785229, and a standard deviation of 284986289.26. These findings indicate on average that commercial banks in Nigeria had high AI transactions with deviation widely spread from the mean. The skewness value of 2.196 with a kurtosis value of 5.539 indicates that the data were positively skewed with a leptokurtic (peaked) distribution. The range and variance statistics show the spread of AI transactions.

From the findings, the average Big Data transaction was 12202035.11 with a minimum value of 0, a maximum weight of 31034624, and a standard deviation of 13808566.268. These findings

indicate on average that commercial banks in Nigeria had high Big data transactions with deviation widely spread from the mean. The skewness value of 0.449 with a kurtosis value of -1.831 indicates that the data were positively skewed with a platykurtic (tailed) distribution. The range and variance statistics show the spread of Big Data transactions.

The average ATM transaction was 360147503.81 with a minimum value of 60133610.47, a maximum value of 875519307, and a standard deviation of 244674372.81. These findings indicate on average that commercial banks in Nigeria had high ATM transactions with deviation widely spread from the mean. The skewness value of 1.175 with a kurtosis value of -0.318 indicates that the data were positively skewed with a platykurtic (tailed) distribution. The range and variance statistics show the spread of ATM transactions.

From the findings, the average POS transaction was 92083056.21 with a minimum value of 918256, a maximum weight of 438614182, and a standard deviation of 110052404.452. These findings indicate on average that commercial banks in Nigeria had high POS transactions with deviation widely spread from the mean. The skewness value of 2.149 with a kurtosis value of 5.163 indicates that the data were positively skewed with a leptokurtic (peaked) distribution. The range and variance statistics show the spread of POS transactions.

From the findings, the average Web Pay transaction was 19825657.68 with a minimum value of 1601086, a maximum weight of 103497007, and a standard deviation of 24030087.68. These findings indicate on average that commercial banks in Nigeria had high Web Pay transactions with deviation widely spread from the mean. The skewness value of 2.612 with a kurtosis value of 8.184 indicates that the data were positively skewed with a leptokurtic (peaked) distribution. The range and variance statistics show the spread of Web Pay transactions.

4.2 Correlation Matrix and Multicollinearity

Table 2: Matrix Correlation

	ROA	ROE	ATM	POS	WEB PAY	BCT	A.I	BD
ROA	1							
ROE	0.507*	1						
	0.027							
ATM	0.111	0.123	1					
	0.052	0.016						
POS	0.244	0.280	0.695**	1				
	0.013	0.046	0.001					
WEBPAY	0.309	0.225	0.649**	0.460**	1			
	0.018	0.035	0.003	0.000				

BCT	0.239	0.151	0.504*	0.487**	0.498**	1		
	0.024	0.036	0.028	0.000	0.000			
A.I	0.244	0.287	0.681**	0.499**	0.508**	0.576**	1	
	0.024	0.033	0.001	0.000	0.000	0.000		
BD	-0.073	0.498*	0.531*	-0.118	-0.180	-0.216	-0.139	1
	0.767	0.030	0.019	0.629	0.461	0.375	0.570	

Table 2 highlights the correlation matrices of the variables adopted in the study. The relationship between commercial bank transactions and the firm's financial performance was investigated using the Pearson product-moment correlation coefficient approach on data analysis. Pearson correlations and their probability values (parenthesis) are reported for the correlation among all variables, dependent variables, and independent variables used for the auxiliary regression.

From table 2, there was a significantly strong and positive association between ATM transactions and ROA at the 5% level of significance [r = 0.111, (p = 0.052)]. There was a positive and significant correlation between POS transactions and ROA at the 5% level of significance [r = 0.244, (p =0.013)]. There was a positive association between WEB PAY transaction and ROA at the 5% level of significance [r = 0.309, (p = 0.018)]. There was a positive association between BCT transaction and ROA at the 5% level of significance [r = 0.239, (p = 0.024)]. The data revealed that A.I transactions and return on assets (ROA) have positive correlations at the 5% level of significance [r = 0.244, (p = 0.024)]. And there was also a negative and insignificant correlation between BD transactions and ROA at the 5% level of significance [r = -0.073, (p = 0.767)].

From table 2, there was a significantly strong and positive association between ATM transactions and ROE at the 5% level of significant [r = 0.123, (p = 0.016)]. There was a positive and significant correlation between POS transactions and ROE at the 5% level of significance [r = -0.280, (p = 0.046)]. There was a positive and significant relationship between WEB PAY transactions and ROE at the 5% level of significance [r = 0.225, (p = 0.035)]. There was a positive association between BCT transaction and ROE at the 5% level of significance [r = 0.151, (p = 0.036)]. The data revealed that A.I transactions and return on equity (ROE) have positive correlations at the 5% level of significance [r = 0.287, (p = 0.033)]. And there was also a positive and significant correlation between BD transactions and ROE at the 5% level of significance [r = -0.498, (p = 0.030)].

The volume of ATM transactions was positively associated with the volume of POS transactions [r = 0.695, (p = 0.001)], the volume of Web Pay transactions is positively associated with the volume of ATM transactions [r = -0.649, (p = 0.003)], the volume of Mobile Pay transaction is positively associated with the volume of ATM transactions [r = 0.504, (p = 0.028)], the volume of ATM transactions is positively associated with the volume of NIP transactions [r = 0.681, (p = 0.001)], the volume of NEFT transactions is positively associated with the volume of ATM

transactions [r = 0.531, (p = 0.019)]. The volume of POS transactions is positively associated with the volume of Web Pay transactions [r = 0.460, (p = 0.000)], the volume of BCT transaction is positively associated with the volume of POS transactions [r = 0.487, (p=0.000)], the volume of POS transactions is positively associated with the volume of AI transactions [r = 0.499, (p = 0.000)], the volume of BD transactions is negatively associated with the volume of POS transactions [r = -0.118, (p = 0.629)]. The volume of BCT transaction is positively associated with the volume of Web Pay transactions [r = 0.498, (p = 0.000)], the volume of Web Pay transactions is positively associated with the volume of AI transactions [r = 0.508, (p = 0.000)], the volume of BD transactions is negatively associated with the volume of Web Pay transactions [r = -0.180, (p = 0.461)]. The volume of Mobile Pay transactions is positively associated with the volume of A.I transactions [r = 0.576, (p = 0.000)], the volume of BD transactions is negatively associated with the volume of BCT transactions [r = -0.216, (p = 0.375)]. At the same time, the volume of BD transactions is negatively associated with the volume of AI transactions [r = -0.139, (p = 0.570)]. The correlations indicate that there is a significant association between the independent variables and the dependent variables.

However, the multicollinearity test indicates that all the dependent variables do not have correlations higher than 80 percent. This shows no presence of multicollinearity. The absence of multicollinearity is the desired characteristic of the data to help perform regression analyses.

4.3 Discussion of Findings

Table 3: OLS Regression Result

		Model 1	Model 2
Dependent Variables		ROA	ROE
C	Coefficient	-0.558	-64.623
	(p-value)	(0.003)	(0.026)
ATM	Coefficient	0.966	77.223
	(p-value)	(0.000)	(0.008)
POS	Coefficient	0.424	16.623
	(p-value)	(0.031)	(0.018)
WEB PAY	Coefficient	0.375	80.159
	(p-value)	(0.001)	(0.000)
BCT	Coefficient	0.672	13.968
	(p-value)	(0.015)	(0.027)
A.I	Coefficient	0.766	8.453
	(p-value)	(0.011)	(0.036)
BD	Coefficient	0.497	4.044
	(p-value)	(0.263)	(0.160)
R-square		0.635	0.539
F-Statistics		3.481	3.342

F (Prob)	(0.031)	(0.049)

The results are reported using the Ordinary Least-Square (OLS) model to explore the relationship between financial technology and financial performance of banks. Model 1 regressed the predictability of financial technology variables on ROA revealed a R-squared value of 0.635 with a significant F-stat value of 3.481 ($p = 0.031$). This indicates that all the independent variables jointly explained about 63.5 percent variation in ROA. The F-stat value with a $p < 0.05$ suggests that the model is statistically fit. Model 2 regressed the effects of financial technology variables on ROE revealed a R-squared value of 0.539 with a significant F-stat of 3.342 ($p = 0.049$). This indicates that all the independent variables jointly explained about 53.9 percent variation in ROE. The F-stat value with a $p < 0.05$ suggests that the model is statistically fit.

Block Chain Technology transactions and ROA and ROE

The results in model 1 show that the adoption of Block chain technology as a financial innovation product predicts ROA positively with a coefficient of 0.672. Stated differently, Block chain technology has a positive influence on returns on assets as a performance measure of banks in Nigeria. The $p = 0.015$ indicates that the positive impact is significant at the 0.05 level. The results in model 2 show that the adoption of Block chain technology as a financial innovation product predicts ROE positively with a coefficient of 14.0. In other words, Block chain technology has a positive impact on returns on equity as a performance measure of banks in Nigeria. The $p = 0.027$ indicates that the positive impact is significant at the 0.05 level. These results have strong correlation with the work of El-Chaarani and El-Abiad (2018), who confirmed that investment in internet banking had a substantial beneficial influence on the performance of Lebanese banks.

Artificial Intelligence transactions and ROA and ROE

The results in model 1 show that the adoption of AI as a financial innovation product predicts ROA positively with a coefficient of 0.766. Stated differently, AI innovation positively impacts the returns on assets as a performance indicator of banks in Nigeria. The p value of 0.011 indicates that the positive impact is significant at the 0.05 level. The results in model 2 show that the adoption of AI as a financial innovation product predicts ROE positively with a coefficient of 8.5. In other words, AI innovation positively impacts the returns on equity as a performance indicator of banks in Nigeria. The p value of 0.036 indicates that the positive impact is significant at the 0.05 level. These results are however in contrast with the results of El-Chaarani and El-Abiad (2018), who confirmed that investment in computer software had no considerable effect on the performance of Lebanese banks.

Big Data transactions and ROA and ROE

The results in model 1 show that the adoption of Big data as a financial innovation product predicts ROA positively with a coefficient of 0.497. In other words, BD innovation positively influence returns on assets as a performance measure of banks in Nigeria. The $p = 0.263$ indicates that the positive impact is significant at the 0.05 level. The results in model 2 show that the adoption of BD as a financial innovation product predicts ROE positively with a coefficient of 4.04. Stated

differently, BD innovation positively predicts returns on equity as a performance measure of banks in Nigeria. The p = 0.160 indicates that the positive influence is significant at the 0.05 level. These results corroborate the findings of Ndwiga and Maina (2018), who confirmed that process innovation had a substantial beneficial impact on the financial performance of publicly traded commercial banks.

ATM transactions and ROA and ROE

The results in model 1 show that the adoption of ATM as a financial innovation product predicts ROA positively with a coefficient of 0.966. Stated differently, ATM innovation positively impacts the returns on assets a performance measure of banks in Nigeria. The p = 0.000 indicates that the positive impact is significant at the 0.05 level. The results in model 2 show that the adoption of ATM as a financial innovation product predicts ROE positively with a coefficient of 77.2. Stated differently, ATM innovation positively impacts returns on equity as a performance measure of banks in Nigeria. The p = 0.008 indicates that the positive impact is significant at the 0.05 level. These results are not in line with the findings of Shen and Chen (2018) who found out that the value of transactions on Automated Teller Machines (ATMs) and Points of Sale (POS) were shown to be adversely associated with the efficiency ratio.

POS transactions and ROA and ROE

The results in model 1 show that the adoption of POS as a financial innovation product predicts ROA positively with a coefficient of 0.424. Stated differently, POS innovation positively affects returns on assets as a performance measure of banks in Nigeria. The p = 0.031 indicates that the positive impact is significant at the 0.05 level. The results in model 2 show that the adoption of POS as a financial innovation product predicts ROE positively with a coefficient of 16.6. Stated differently, POS innovation positively impacts returns on equity as a performance measure of banks in Nigeria. The p = 0.018 indicates that the positive impact is significant at the 0.05 level. This outcome is in line with the study of Shen and Chen (2018), who found evidence that banks' efficiency ratio had a statistically considerable effect on the value of POS transactions.

Web Pay transactions and ROA and ROE

The results in model 1 show that the adoption of Web Pay as a financial innovation product predicts ROA positively with a coefficient of 0.375. In other words, Web Pay innovation positively predicts returns on assets as a performance indicator of banks in Nigeria. The p = 0.001 indicates that the positive influence is significant at the 0.05 level. The results in model 2 show that the adoption of Web Pay as a financial innovation product predicts ROE positively with a coefficient of 80.2. Stated differently, Web Pay innovation positively impacts the returns on equity of banks in Nigeria. The p = 0.000 indicates that the positive impact is significant at the 0.05 level. This result is in contrast with Shen and Chen (2018), who found out that web/internet and mobile banking were favourably related, with only web/internet being substantially related. According to their granger impact evaluation, financial innovation products, as measured by the value of transactions on ATMs, the web/internet, POS, and mobile banking, had no substantial influence on deposit money banks' efficiency ratios in Nigeria.

5.0 CONCLUSION

The study concludes that that financial technology innovations in the form of ATM, POS, Web pay, Block chain technology, Artificial intelligence and Big data have a significant influence on the financial performance of commercial banks in Nigeria. The study recommends that banks should transform banking services by deliberate and generous adoption of financial innovations driven by disruptive technologies to stay viable and profitable in the long run.

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