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COVID-19 PANDEMIC: FINANCIAL DISRUPTIVE INNOVATIONS AND PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

The study examined the relationship between covid-19 pandemic: financial disruptive innovations and performance of deposit money banks (DMB's) in Nigeria for the duration of 2000-2020 (21years). This was done respect of measures of financial disruptive innovations, namely; Automated Teller Machine (ATM), Point of Sale (POS), Internet Banking (INTB) and Mobile Banking (MB) and how the effects performance of deposit money banks in Nigeria {proxy with Return on Equity (ROE)}. The method of data collection used in this study is the secondary source of data (time series data), from the CBN Bank Supervisory Annual Report, CBN Statistical Bulletin and Nigeria Deposit Insurance Corporation (NDIC) Annual Reports for the period 2000-2020. The data set was described using descriptive statistics and the unit root test was conducted to ascertain if the data are stationary in order to have accurate regression result. The correlation analysis will be use to ascertain the co-movement of the independent variables in relation to the dependent variable while the Multiple Regression analysis were employed with the aid of E-VIEW version 9.0 for the purpose of testing the research hypotheses raised. The finding revealed that ATM and POS has positive significant effect on ROE of DMB's in Nigeria while INTB and MB has negative insignificant effect on

ROE of DMB's in Nigeria. Hence, the study concluded that the relationship between financial disruptive innovations and performance of deposit money banks in Nigeria significant, and it's affected the banking industry positively. It is therefore recommended that, Investment in technological disruptions has been proven to enhance the finance of Nigerian commercial banks. The banks should therefore give emphasis to efficient utilization of the financial disruptive innovations enabled services such as POS, MB, ATM and INTB.

Keywords: Covid-19 pandemic, Financial Disruptive Innovations, performance and Deposit Money Banks.

INTRODUCTION

Introduction: Background to the Study

Prior to the COVID-19 pandemic, individuals, businesses, and governments increasingly relied on disruptive technologies, especially financial disruptive innovations platforms, for a variety of activities including financial transactions, commerce, logistics, education, and health care. Mobile internet traffic per user, a proxy for the use of financial disruptive innovation platforms, grew at a quarterly rate of 12 percent in high-income nations and 10% in middle-income countries in 2019 (Ehiedu, Onuorah & Okoh, 2021). During the COVID-19 crisis, financial disruptive innovations were used in emerging markets; discusses market trends that may increase the role of financial disruptive innovations in emerging markets post-crisis; and examines the risks and opportunities of faster adoption of financial disruptive innovations in emerging markets (IFC, 2020).

Banking is evolving from a branch-based (i.e. brick-and-mortar) model to one that heavily relies on information technology and big data, as well as highly specialized human resources. Even before that, banks and markets had become increasingly interwoven, with a greater proportion of intermediate activity moving to the open market (Ehiedu, Onuorah & Mbagwu, 2022). Banks are facing greater competition from other intermediaries, as well as increasingly disruptive financial innovations in their core businesses, such as payment and advice services. With the rise of the FinTech industry (short for Financial Technologies), which may be defined as the use of innovative information and automation technology in financial services, a shift in the use of financial disruptive innovations in producing new services and business models has been unfolding (Vives, 2016).

During the covid-19 and post-covid-19 eras, the adoption of many new financial disruptive innovations, as well as the acquisition of users linked with them, has accelerated dramatically. Indeed, the greatest change today comes from the sector's financial disruptive developments, which have left incumbents with possibly outmoded legacy systems (such as the mainframe) and overextended branch networks to support new competitors' new service standards. In terms of interface friendliness and transparency, customers have a new service expectation. In terms of enhancing competitiveness and contestability in banking markets, financial disruptive technologies will be a game changer with a potentially big impact. Banking will shift to a platform-based, customer-centric paradigm, requiring incumbents to restructure (Vives, 2019). Financial disruptive innovations have the ability to significantly improve DMBs performance through innovation, increased supplier diversity, and a more competitive financial system that results in market extension and financial inclusion (Ehiedu, Odita & Kifordu, 2020). These

financial disruptive developments will put pressure on incumbents' margins, thereby encouraging higher risk-taking, and spark a race to seize the sector's rents. For the efficiency potential to be fulfilled, incumbents must be restructured at the same time as new competitors enter the market, and new dominant positions must not become established. Instead of circumventing regulation or monopolizing the consumer interface, new entrants (FinTech and BigTech) should win market share based on performance gains. Regulators must also work to identify emerging vulnerabilities to financial stability posed by new types of systemic risk (Philippon, 2018).

Financial disruption has become a necessity for human endeavors, particularly in the areas of economic development, commercial transactions, service quality, and productivity (Vives, 2019). The utilization of software, hardware, services, and supporting infrastructures to manage and convey information via voice, data, and video is referred to as financial disruptive innovation (Uduji, 2013). The implementation of financial disruptive innovations has altered the overall corporate environment in unprecedented ways (Uduji, 2013). The banking industry, for example, has reaped significant benefits from an online business (e-business) approach (Vives, 2019).. E-business is a subset of financial disruptive innovation applications that is often utilized to develop, innovate, and increase the banking industry's competitiveness and performance (Oluwatolani, Joshua, & Philip, 2015).

Traditional delivery methods (manual methods), according to Idowu, Patrick, and Willy (2016), have given way to new delivery financial disruptive innovations, such as ATM transactions, POS transactions, Internet banking transactions, NEFT transactions, NIP transactions, and Mobile banking transactions. The quality and quantity of financial disruptive innovations products and services that the financial industry offers clients determines the extent to which it can contribute to the economy (Ehiedu, Onuorah & Chigbo, 2022). Thus, the purpose of this study is to examine how financial disruptive technologies may affect the Nigerian banking industry in terms of performance (as measured by DMBs' return on equity).

Statement of Problem

Network (communication links between banks and financial disruptive innovations infrastructures) issues, literacy, risk concerns, and unreliable machines are among the key challenges customers confront when implementing financial disruptive innovations. According to (Obiekwe and Anyanwaokoro, 2017), the adoption of financial disruptive technologies in banking has posed significant risk exposure concerns to the banking industry, particularly during the covid-19 and post covid-19 eras. Since its implementation in the economy, the volume of deposits has increased, as have the fraudulent practices faced by Nigerian banks. Despite the rapid adoption of financial disruptive innovations tools such as SMS, Internet, online banking, and real-time gross settlement to improve banking operations, Nigerian banks continue to face challenges in modernizing their operations in order to increase productivity, improve service quality, and reduce average operating costs and time.

Prior studies, such as Umanhonlen, Umanhonlen, and Igbinoba (2016) and Taiwo, Ayo, Afieroho, and Agwu (2017), focused on the program's prospects, problems, and benefits, focusing on whether the policy met the stated objectives set by the CBN at the time of its introduction. Oladejo (2016) and Obiekwe and Anyanwaokoro (2017) used financial disruptive innovations products as proxies for cashless banking and discovered that they are positively correlated with bank performance. According to Abaenewe, Ogbulu, and Ndugbu (2016), the

use of financial disruptive technologies in banking has boosted Nigerian banks' returns on equity (ROE) dramatically. However, it was also discovered that financial disruptive technologies in banking have had little impact on Nigerian banks' returns on assets (ROA). As a result, previous research yielded mixed results, and none of the studies included more than three financial disruptive innovation variables.

Thus, the purpose of this study is to fill in the gaps by examining the effective use of financial disruptive innovations (proxy with ATM transactions, POS transactions, Internet banking transactions, and Mobile banking transactions) in Nigerian banks, with the goal of establishing a link between the adoption of selected financial disruptive innovations tools and their impact on deposit money bank performance (proxy with ROE). Hence, the purpose of this study is to examine how financial disruptive innovations affect DMBs performance in Nigeria.

REVIEW OF RELATED LITERATURE

Conceptual Framework

Concept Financial Disruptive Innovations

Financial disruptive innovations, according to the Organization for Economic Co-operation and Development [OECD] (2018), are financial operations that use digital technology, such as electronic money, mobile financial services, online financial services, i-teller, and branchless banking, whether through banks or non-bank institutions (OECD 2018).

Michelle (2016) defines financial disruptive innovations as "a pre-arrangement of some combination of money-related and payment benefits that are conveyed and overseen through portable or online advancements and a system of experts." It also refers to the wide-ranging technologies (e-money, mobile money, card payments, and electronic funds transfers) that enable a wider range of providers to deliver financial services to a larger group of people (Asian Development Bank, 2016).

During the COVID-19 crisis, financial disruptive innovations were used in emerging markets; discusses market trends that may increase the role of disruptive technologies in emerging markets after the crisis; and examines the risks and opportunities of faster adoption of disruptive technologies in emerging markets (IFC, 2020). Financial disruptive innovations include financial services delivered using mobile phones, mobile wallets, personal computers, the internet, or debit or credit cards linked to a secure digital payment system (Durai & Stella, 2019; Shofawati, 2019). It includes all goods, services, technology, and infrastructure that enable consumers and businesses to use the internet to make payments, save money, and borrow money without having to go to a bank or deal directly with a financial service provider (Shofawati, 2019).

Concept of Bank Performance

Profitability ratios are used to assess a bank's financial performance. These figures show a bank's overall efficiency and performance. Because of their utility in determining the bank's bottom line, profitability ratios are financial analysis tools. Managers and owners need to know how to use profitability ratios to analyze financial performance since they show a bank's overall efficiency and outcomes, which are critical for making decisions. Profitability ratios are traditionally divided into two parts: margins and returns. Profitability ratios that deal with margins focus on a company's ability to convert sales into profits at various stages of measurement. Profitability ratios that depict returns, on the other hand, indicate the firm's ability to gauge general efficiency and effectiveness in order to provide returns to the owners.

In the case of bank returns, ratios are carefully calculated to assess the profitability of the institution (Moody, 2017).

Theoretical Framework

Schumpeterian Theory of Creative Destruction

Ikpefan, Akpan, Osuma, Evbuomwan, and Ndigwe (2018) quote Schumpeter (1928, 1939), who saw technological disruptions as continual gales of creative destruction that were necessary forces driving growth rates in a capitalist society. Some scholars have distinguished Schumpeter's early thinking, in which innovation was largely dependent on exceptional individuals willing to take on exceptional risks as "an act of will," i.e., entrepreneurs, from his later thinking, in which large corporations were recognized as playing a role in organizing and supporting technological disruptions. As a result, he focused on the role of oligopolies in innovation, which was later misinterpreted as his main contribution (Freeman, 1994) quoted Ikpefan, et al (2018). Ikpefan, et al (2018), citing Schumpeter (1928), emphasized the discontinuous and disruptive nature of technical progress under capitalism, which results in an inextricable mix of short-term instability and long-term growth. He was not a technological determinist, but he was aware of the social and organizational forces at work in his cyclical industrial transformation process.

Entrepreneurs, whether they were solo inventors or R&D engineers in huge organizations, according to Schumpeter, created the prospect for fresh profits through their ideas. As a result, groups of imitators lured by super-profits would launch a wave of investment, eroding the innovation's profit margin. However, before the economy could rebalance, a new financial disruptive technology or combination of technological disruptions, dubbed Kondratiev cycles by Schumpeter, would emerge, restarting the business cycle (Ikpefan, et al, 2018).

Researchers like as Abramovitz (1956) and Solow (1957) emphasized the importance of technological disruption, citing Ikpefan, et al (2018), who demonstrated how little neoclassical economics could explain. Solow used data on the US economy from 1909 to 1949 to show that increased capital utilization accounted for only 12.5 percent of the growth in per capita output. Solow attributed the very huge 87.5 percent residual to technical change. Ikpefan, et al (2018), quoted by Romer (1986, 1994), shares Solow's insight and calls for technological disruption theorists to incorporate the process of technological disruption within their models. To that purpose, the work on technological disruption that arose from Schumpeter's foundation has focused on the emergence of technology disruption and its subsequent dispersion throughout enterprises, industries, and regions.

The Schumpeterian theory is relevant because new technology replaces old technology which is better because new technology is better and adds value to the adopter.

Innovation Diffusion Theory (IDT)

Roger established the innovation diffusion hypothesis in 1983, which was used in this investigation. This hypothesis explains why people want to use technology to accomplish a traditional task in a new way. The following assumptions are the important criteria that affect the acceptance of an innovation at a broad level: relative advantage, compatibility, complexity, trialability, and observability. It is concerned with the transition from creation to usage of a new technological idea, technique, or novel application of an old one (Kim, 2016). According to innovation diffusion theory, technical innovation is disseminated among members of a social system over time through specific channels. Knowledge (awareness of its existence and

comprehension of its functions); persuasion (the formation of a favorable attitude toward it); decision (commitment to its adoption); implementation (putting it to use); and confirmation (reinforcement based on positive outcomes) are the stages through which a technological innovation passes.

The relevance of the theory to the study is that it stresses that technological disruptions which is communicated through particular channels (POS, ATM, internet and mobile), over time has ensure the efficiency and effectiveness in service delivery in the banking sector, thus improve the performance of banks in Nigeria.

Empirical Review

Using quantitative and descriptive survey design and responses from 120 respondents drawn from customers of First Bank of Nigeria Plc and Guaranty Trust Bank Plc sited at Ile-Ife, Osun State, Nigeria, Oluyi and Abioye (2020) explored the relationship between electronic banking and service delivery 120 respondents drawn from customers of First Bank of Nigeria Plc and Guaranty Trust Bank Plc sited at Ile-Ife, Osun State, Nigeria. The study found out those customers of both banks (59.0%) use electronic bill payment frequently, while 28.5% of FBN customers use it, 30.5% of GTB customers use it. This means customers of GTB use it more frequently than FBN's. In addition, customers of GTB (62%) are more satisfied with most of the electronic banking service delivery channels than customers of FBN (38%). In a nutshell, the customers of both banks are satisfied with electronic banking services, but GTB customers are more satisfied with the various electronic banking service delivery channels than customers of FBN. The study concluded that electronic banking has enabled many customers of both banks who would have otherwise been excluded from using the technological innovation for enhanced service delivery to use it and recommended that banks should educate their customers more on electronic banking services and promote the services in both English Language and local languages.

Using secondary data sourced from Central Bank of Nigeria's (CBN) Statistical Bulletin and CBN Financial Stability Reports and analyzed by conducting unit root test and co-integration bound test, via Autoregressive Distributed Lags using E-view 9.0 version, Olaiya and Adeleke (2019) explored the relationship between electronic banking and profitability of deposit money banks (DMB) in Nigeria between 2010 and 2018. Electronic banking was proxied with automatic teller machine transaction value (ATMTV), point of sale transaction value (POSTV), mobile banking transaction value (MBTV) and internet banking transaction value (IBTV) while commercial banks performance was proxied by returns on assets (ROA). The result showed that ATMTV and POSTV individually have positive relationship ROA, while both MBTV and IBTV individually have negative relationship with ROA. The study therefore, concludes that digital banking channels have no significant effect on the performance of banks in Nigeria in the short run for the period covered by the study.

Using diagnostic test, which comprises of Descriptive Statistic Analysis, Multicolinearity test, Correlation testing and Herteroskadaticity testing on panel data were collected from annual report and account of a sample of 14 banks for duration of 6years, Muotolu and Nwadialor (2019) investigated the effect of Central Bank of Nigeria Cash less Policy and the Financial Performance of DMBs in Nigeria. The study used return on Asset as proxy for bank performance while the value transactions done through the ATM, POS, Internet Banking, NIP and NEFT platforms (E-banking Products) were used to proxy cash less policy. Result showed

that (ATMV) has a positive and significant effect on return on assets (ROA) of banks in Nigeria while , POSV, WEBV, NIPV and NEFV were found to have a positive but insignificant effect on ROA of quoted banks in Nigeria. The study concluded that E-banking products as a proxy for cash less policy has positive effect on the financial performance of DMBs in Nigeria.

Using Ordinary Least Square (OLS) and Secondary data sourced from Central Bank of Nigeria Statistical Bulletin for the duration 2000-2018, Andabai and Bina (2019) explored the effect of cashless policy and DMBs performance Nigeria. Cashless policy was proxy automated teller machine (ATM), point-of-sale (POS), and mobile banking (MB) while return on assets was proxy for DMBs performance. There is a significant impact of automated teller machine transaction, Point on Sales terminal transactions and electronic mobile payment on return on assets of DMBs in Nigeria. The study concludes that cashless policy has a significant impact on DMBs performance in Nigeria.

Employing ordinary least square method and analyzing the data sourced from Central Bank of Nigeria (CBN) annual report and the Nigerian Interbank Settlement System (NIBSS) website, Ikpefan, Akpan, Osuma, Evbuomwan and Ndigwe (2018) ascertained the effect of electronic banking tools on cashless policy in Nigeria for 10years (2006-2015) duration. The result of the study showed that there is an insignificant effect of electronic banking tools on the currency in circulation.

RESEARCH METHODOLOGY

Introduction

An ex-post facto research design was used for this investigation. Ex-post Facto is a method of determining the elements that are linked to a specific occurrence, situation, event, or behaviour by examining prior events or data for possible causal factors. The data used in this investigation was primarily secondary data. To ensure the empirical result's robustness, the study's scope was extended from 2001 to 2021 sourced from CBN Annual Report, CBN Bank Supervisory Annual Report and Nigeria Deposit Insurance Corporation (NDIC) Annual Reports for the period 21years.

Model Specification and Statistical Tool

In this study, the statistical technique of data analysis was used. The time series data were subjected to a unit root test to determine whether or not they are stationary. After that, descriptive statistics and correlation analysis were used to assess the nature of the link between the independent and dependent variables. The computer statistical software E-VIEW 9.0 was used to do multiple regression analysis through the regression model. This is the proper procedure for analyzing data in relation to the study in issue. The model is specified below:

$$\mathbf{ROE = f(ATM, POS, INTB, MB)}$$

$$\mathbf{ROE = \beta_0 + \beta_1 ATM + \beta_2 POS + \beta_3 INB + \beta_4 MB + U}$$

$$\mathbf{LogROE = \beta_0 + \beta_1 LogATM + \beta_2 LogPOS + \beta_3 LogINB + \beta_4 LogMB + U}$$

Where:

ROE = Human Development Index, β_0 = Constant Term, β_1=Coefficient of Automated Teller Machine, ATM = Automated Teller Machine, β_2 = Coefficient of Point of Sale, POS = Point of Sale, β_3 = Coefficient of Internet Banking, INTB= Internet Banking, β_4 = Coefficient of Mobile Banking, MB= Mobile Banking, U = Disturbance Term (other variable not mentions in the model) and the a priori expectation is $\beta_1, \beta_2, \beta_3, \beta_4 > 0$.

RESULT AND DISCUSSIONS

Table 1
Descriptive Statistics

	LOGROE	LOGATM	LOGPOS	LOGINTB	LOGMB
Mean	1.274213	2.608411	1.709696	1.704928	1.391272
Median	1.342620	2.739256	1.104487	1.646404	0.822822
Maximum	1.778658	3.813755	3.505794	2.829895	3.705946
Minimum	0.568636	0.733999	0.322219	0.994317	0.004321
Std. Dev.	0.480064	1.047317	1.022068	0.494075	1.384808
Skewness	2.744853	0.416975	0.496278	0.730627	0.410958
Kurtosis	2.960592	1.804989	1.710175	2.809193	1.492760
Jarque-Bera	91.17394	1.858082	2.317714	1.900214	2.578904
Probability	0.000000	0.034932	0.013845	0.036700	0.025422
Sum	26.75848	54.77663	35.90362	35.80349	27.53671
Sum Sq. Dev.	4.609225	21.93746	20.89244	4.882203	38.35388
Observations	21	21	21	21	21

Source: EVIEW, 9.0 Outputs, 2022.

Table 1 above is the presentation of the descriptive statistics. The mean value for the ROE recorded a mean value of 1.2742 with a standard deviation of 0.4801. Also, ATM, recorded a mean of 2.6084 and standard deviation of 1.0473, POS, recorded that a mean of 1.7097 with a standard deviation of 1.0221, INTB, recorded that a mean of 1.7049 with a standard deviation of 0.4941 and MB recorded an average value of 1.3913 with a standard deviation of 1.3848. Since the standard deviations for all the variables are lesser than respectively means, it shows that the data are not widely dispersed.

The normal distribution has a kurtosis of three, which indicates that the distribution has neither fat nor thin tails. Consequently, if an observed distribution has a kurtosis greater than three, the distribution has heavy tails when compared to the normal distribution. Since all the kurtosis coefficients in Table 1 are lesser than 3, this shows that ROE, ATM, POS, INTB and MB have thin tails when compared to the normal distribution.

Multicollinearity Test

Since the data for the study are annual time series, the multicollinearity test was conducted to ascertain if the data contained multicollinearity, this is presented in table 2 below;

Table 2
Variance Inflation Factors Multicollinearity Test

Variance Inflation Factors
Date: 11/22/21 Time: 14:09
Sample: 2000 2020
Included observations: 21

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.389769	33.94287	NA
LOGATM	0.054263	37.08771	4.936432
LOGPOS	0.864456	294.9456	7.895244
LOGINTB	0.440359	120.3861	8.915479
LOGMB	0.314960	97.25499	5.094101

Source: EVIEW, 9.0 Outputs, 2022.

Multicollinearity occurs in a data set when two or more independent variables in multiple regression models are highly correlated. In order to ensure that the results of this study are

valid, the variance inflation factor (VIF) computed as shown in Table 2. Furthermore, the Centered Variance Inflation Factor (CVIF) statistics for all the independent variables consistently lies between 4.9364, 7.8952, 8.9155 and 5.0941 for ATM, POS, INTB and MB respectively. This indicates the absence of multicollinearity problems among the variables under investigation because the cut off value of VIF is 10. Values of VIF that exceed 10 are often regarded as indicating multicollinearity.

Data Validity Test

Since the data are time series data, spanning for 2001-2021(21years), the validity test was carried out using the Ramsey RESET Test in order to ascertain the validity of the data for the analysis. This is presented in Table 3 below;

Table 3

Data Validity Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.528691	Prob. F(2,14)	0.2509
Obs*R-squared	3.764061	Prob. Chi-Square(2)	0.1523

Source: E-VIEW, 9.0 Outputs, 2022.

Prior to estimating the models, residuals of the variables were ascertained to check for the presence of serial correlation. This was done using the serial correlation LM test. The serial correlation LM test in Table 3 details that there is no element of serial correlation in the models owing to the fact that the p-values of the f-statistics are insignificant at 5% level of significance.

Table 4

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	33.36858	Prob. F(4,16)	0.7373
Obs*R-squared	29.53950	Prob. Chi-Square(4)	0.8497
Scaled explained SS	28.54540	Prob. Chi-Square(4)	0.6310

Source: E-VIEW, 9.0 Outputs, 2022.

The situation in which the variability of a variable is unequal across the range of values of a second variable that predicts it leads to problem of heteroskedasticity. To ensure that there is homoscedasticity in the model estimation, the heteroskedasticity test via the Breusch-Pagan-Godfrey was performed. With the result there is no problem of heteroskedasticity in the models as the p-values of the f-statistics are insignificant at 5% significance level.

Table 5

Ramsey RESET Test

Equation: UNTITLED
Specification: LOGROE C LOGATM LOGPOS LOGINTB LOGMB
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.399614	15	0.1820
F-statistic	1.958918	(1, 15)	0.1820
Likelihood ratio	2.577616	1	0.1084

Source: E-VIEW, 9.0 Outputs, 2022

From the Table 5 above, it confirms that the Durbin Watson stat that our data has no traits of autocorrelation. Indicates that the model is homoskendastic since the probability values of three parameters are greater than 0.05 level of significance. Ramsey test result reveals that our model is correctly specified and is stable.

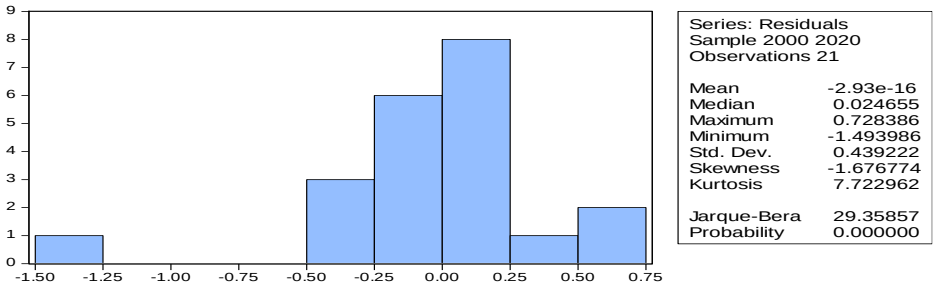

Figure 1: Normality Histogram Test

Source: E-VIEW 9.0 Output, 2022.

The test of residuals for normality was conducted to assess the distribution normality of the model residuals. When residuals are not normally distributed, it denotes the presence of significant outliers in the data which affects the standard errors and then the significance levels of the coefficients. From the test result, it indicates that the residuals are normally distributed as the histogram assumes a bell-shape and the probability value (0.0000000) of the J-B statistic tends towards zero (0) or having a small probability value, this form the premise to reject the null hypotheses that the residuals are not normally distributed.

Augmented Dickey-Fuller (ADF) Unit Root Test

Testing for the existence of unit roots is a principal concern in the study of time series models and co-integration. The rationale behind this test is to avoid the problem of spurious regression which is commonly associated with time series data. The presence of a unit root implies that the time-series data under investigation is non-stationary; while the absence of a unit root shows that the stochastic process is stationary. The unit root test was conducted using the ADF unit root test as presented in table 6 below:

Table 6

Augmented Dickey-Fuller Unit Root Test

Test Variables	**ADF Test Statistic Value**	**Mackinnon Critical Value @ 5%**	**Order of Integration**	**P-Value**	**Decision**
ROE	-5.078997	-3.040391	1(1)	0.0008	**Stationary**
ATM	-3.839179	-3.029970	1(1)	0.0416	**Stationary**
POS	-3.598352	-3.029970	1(1)	0.0440	**Stationary**
INTB	-5.503870	-3.029970	1(1)	0.0003	**Stationary**
MB	-3.509324	-3.029970	1(1)	0.0289	**Stationary**

Source: E-VIEW, 9.0 Outputs, 2022.

The summary of the ADF unit root test output in table 6 above revealed that all the variables under investigation i.e. ROE, ATM, POS, INTB and MB contain unit root test at their first difference 1(1). Evidence of this could be seen from the value of their respective ADF statistics which is more than the critical value at 5%. Moreover, additional evidence of stationary series could also be seen from the p-value for all variables which is less than 5% level of significance greater than 95% confidence level. They all attained stationarity at first difference i.e. at order one. Since the variables are all integrated at order one, we may proceed with Johansen cointegration test.

Johansen Cointegration Cointegration Test

This study further investigates by making use of the (Trace Statistics) and (Maximum Eigenvalue) using the methodology proposed by Johansen and Juselius (1990) in order to ascertain if the variables have a long-run relationship. Thus, Table 7 below presents a summary of the cointegration test:

Table 7

Summary of Johansen Cointegration Test Output

Date: 11/22/21 Time: 14:30
Sample (adjusted): 2002 2020
Included observations: 19 after adjustments
Trend assumption: Linear deterministic trend
Series: LOGROE LOGATM LOGPOS LOGINTB LOGMB

Hypothesized		**Trace**	**0.05**		**Max-Eigen**	**0.05 Critical**	
No. of CE(s)	Eigenvalue	Statistic	**Critical Value**	Prob.**	Statistic	**Value**	**Prob.****
None *	0.956060	123.5776	69.81889	0.0000	59.37385	33.87687	0.0000
At most 1 *	0.832813	64.20372	47.85613	0.0007	33.98417	27.58434	0.0066
At most 2 *	0.519489	30.21955	29.79707	0.0447	23.92519	21.13162	0.0112
At most 3	0.413783	16.29437	15.49471	0.0378	16.14723	14.26460	0.0024
At most 4	0.276412	6.147136	3.841466	0.0132	6.147136	3.841466	0.0132

Researcher's Computation Based E-views 9.0 Output, 2022.
Trace test indicates 4 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 7 above revealed that the result of the multivariate cointegration test by Johansen and Juselius cointegration technique reveal that both the trace statistic and the Maximum Eigenvalue statistic shows evidence of two cointegration relationship (at None and at most 1), where the values of the trace statistic and the Maximum Eigenvalue statistic is greater than their respective critical values at 5% level of significance level. This result conforms to the existence of a stable long-run relationship between performance of deposit money banks.

Table 8

Correlation Matrix

	LOGROE	LOGATM	LOGPOS	LOGINTB	LOGMB
LOGROE	1.000000				
LOGATM	0.298927	1.000000			
LOGPOS	0.168955	0.885573	1.000000		
LOGINTB	-0.159362	0.845507	0.912993	1.000000	
LOGMB	-0.196423	0.874797	0.985641	0.863255	1.000000

Source: EVIEW, 9.0 Outputs, 2022.

The correlation test is presented in Table 8 and it shows the absence of multi-co linearity among the variables since the correlation values are less than 0.7. Furthermore, the result shows the explanatory variables namely; ATM and POS has positive strong correlation with ROE of deposit money banks in Nigeria while INTB and MB has negative strong correlation with ROE of deposit money banks in Nigeria.

Table 9

Multiple Regression Analysis

Dependent Variable: LOGROE
Method: Least Squares
Date: 11/22/21 Time: 14:07
Sample: 2000 2020
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.461835	0.624315	2.341503	0.0325
LOGATM	0.300682	0.132945	2.261702	0.0441
LOGPOS	0.809235	0.329761	2.454005	0.0370
LOGINTB	-0.143346	0.663596	-0.216015	0.8317
LOGMB	-0.413697	0.561213	-0.737148	0.4717

R-squared	0.862914	Mean dependent var	1.274213
Adjusted R-squared	0.746358	S.D. dependent var	0.480064
S.E. of regression	0.491065	Akaike info criterion	1.619777
Sum squared resid	3.858318	Schwarz criterion	1.868472
Log likelihood	12.00765	Hannan-Quinn criter.	1.673750
F-statistic	20.78481	Durbin-Watson stat	2.429205
Prob(F-statistic)	0.005282		

Source: EVIEW, 9.0 Outputs, 2022.

The multiple regression results in Table 9 above, the coefficient of Automated Teller Machine (ATM) is 0.3007 with a t-value of 2.2617 and an associated p-value (sig. value) is 0.0441. This suggests that ATM have a positive significant effect on ROE. This relationship is significant given the fact that the p-value of 0.0441 is lesser than 0.05 (5%) level significance. The coefficient of ATM is 0.3007, which imply that ATM has a positive trend with ROE. One percent (1%) movement in ATM would lead to 30.07% increase in ROE of deposit money banks in Nigeria. This finding is in tandem with the findings of Muotolu and Nwadialor (2019).
Also, the multiple regression results in Table 8 above, the coefficient of POS are 0.8092 with a t-value of 2.4540 and an associated p-value (sig. value) is 0.0370. This suggests that POS have a positive significant effect on ROE. This relationship is significant given the fact that the p-value of 0.0370 is lesser than 0.05 (5%) level significance. The coefficient of POS is 0.8092 which imply that POS has a positive trend with ROE. One percent (1%) movement in POS would lead to 80.92% increases in ROE of deposit money banks in Nigeria. The finding is in agreement with the findings of Obiekwe and Anyanwaokoro (2017).
More also, the multiple regression results in Table 8 above, the coefficient of INTB is -0.1433 with a t-value of -0.2160 and an associated p-value (sig. value) is 0.8317. This suggests that INTB have a negative insignificant effect on ROE. This relationship is not significant given the fact that the p-value of 0.8317 is greater than 0.05 (5%) level significance. The coefficient of INTB is -0.1433, which imply that INTB has a negative trend with ROE. One percent (1%) movement in INTB would lead to 14.33% decrease in ROE of deposit money banks in Nigeria. The finding is in agreement to the findings of Muotolu and Nwadialor (2019) contrary to the findings of Morufu (2016).
Finally, the multiple regression results in Table 8 above, the coefficient of MB is -0.4137 with a t-value of -0.7372 and an associated p-value (sig. value) is 0.4717. This suggests that MB have a negative insignificant effect on ROE. This relationship is not significant given the fact that the p-value of 0.4717 is greater than 0.05 (5%) level significance. The coefficient of MB is -0.4137 which imply that MB has a negative trend with ROE. One percent (1%) movement in MB would lead to 41.37% decrease in ROE of deposit money banks in Nigeria. This finding is in tandem with the findings of Muotolu and Nwadialor (2019).

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Summary of Findings

Based on the analysis, the finding revealed that ATM and POS has positive significant effect on ROE of deposit money banks in Nigeria while INTB and MB has negative insignificant effect on ROE of deposit money banks in Nigeria.

Conclusion

The study examined the relationship between covid-19 pandemic: financial disruptive innovations and performance of deposit money banks in Nigeria for the duration of 2000-2020 (21years). This was done respect of measures of financial disruptive innovations, namely;

ATM, POS, INTB and MB and how the effects performance of deposit money banks in Nigeria {proxy with ROE}. The method of data collection used in this study is the secondary source of data (time series data), from the CBN Bank Supervisory Annual Report, CBN Statistical Bulletin and Nigeria Deposit Insurance Corporation (NDIC) Annual Reports for the period 2001-2021. The data set was described using descriptive statistics and the unit root test was conducted to ascertain if the data are stationary in order to have accurate regression result. The correlation analysis will be use to ascertain the co-movement of the independent variables in relation to the dependent variable while the Multiple Regression analysis were employed with the aid of E-VIEW version 9.0 for the purpose of testing the research hypotheses raised. The finding revealed that ATM and POS has positive significant effect on ROE of deposit money banks in Nigeria while INTB and MB has negative insignificant effect on ROE of deposit money banks in Nigeria. Hence, the study concluded that the relationship between financial disruptive innovations and performance of deposit money banks in Nigeria significant, and it's affected the banking industry positively.

Recommendations

The following recommendations are made:

(a) It is therefore recommended that, Investment in financial disruptive innovations has been proven to enhance the finance of Nigerian deposit money banks. The banks should therefore give emphasis to efficient utilization of the financial disruptive innovations enabled services such POS, MB, ATM and INTB.

(b) The banks should embark on aggressive campaign and re-orientation of clients to create awareness for the customers to patronize the facilities especially in the area of use of POS, mobile banking and so on.

(c) Finally, the study also recommended that the government should emphasize the need for more policies that will boost the use of ATM, POS, MB and INTB hence long run equilibrium relationship with deposit money banks performance.

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