EFFECTS OF E-TRANSACTIONS ON THE PROFITABILITY OF COMMERCIAL BANKS IN NIGERIA

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Abstract

This study examined the Effects of e-Transactions on the Profitability of Commercial Banks in Nigeria. E-cheque, ATM, POS, Mobile Money Transfer (MMT) and Online Money Payment (WEB) are proxies for E-banking payments while Return on Equity (RoE) is used as proxy for commercial banks profitability. Ex-post-Facto research design is adopted, covering the period 2010-2020. Diagnostic tests are conducted, and analysis of an Auto Regressive Distributed Lag (ARDL) estimated, using Error Correction Model (ECM) approach. The result of analysis indicates that current values of E-CHEQUE, ATM, MMT, POS and WEB are statistically significant at less than 0.05. While E-cheque is insignificant to the profitability of banks in Nigeria. This study thus, rejects the null hypotheses and concludes that with the coefficient of determination (R^2) and adjusted R-Square of the model, about 83% influence on bank profitability in Nigeria can be influenced by these variables of study. It is also meaning that the

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combined effect of the e-banking proxies in this study is statistically significant in explaining the profitability of banks in Nigeria. The recommendations are that Banks should invest in all the channels of electronic payment to ensure that the economy, just like a developed economy fully and seamlessly operates a cashless economy. It is obvious that the fundamental of every developing economy is to make the banking sector stable and sustainable enough to drive its economy.

Keywords: *Commercial banks, E-banking, Innovation, Performance, Point of sales,*

1.1   Introduction

Banking is an intermediating activity that play a pivotal role in the growth and development of a nation, be it developing, emerging and/or developed economy. Before the advent of e-banking and allied transactions electronically, recording of data and its retrieval mechanism were manually done. Today in Nigeria, electronic transaction has not just come to stay but has been widely accepted (Nwankwo & Eze, 2018). Nigeria banks in this 21st century has queued behind the western world economy in technology development by focusing attention on electronic transactions as a veritable option for efficient payment service towards the promotion of rapid financial inclusion, bank development and increased economic activities (Sanusi, 2015).

Accordingly, Ugwueze & Nwezeaku, (2016) asserts that, Information and Communication Technology (ICT) has changed the dimensions of competition in the retail banking sector. In the same vein, Mustapha (2018) and Nwankwo (2018) stressed that electronic banking operations, however, concentrates on the payment aspect of banking activities, and therefore, most technology innovations are to support payment activities. However, in recent times, electronic payment innovations have brought about several electronic payment channels

and subsequent establishments of financial technology companies. The widely used e-payment technologies in the country are; Electronic Cheques (E-cheques), Automatic Teller Machine (ATM), Point of Sale (POS), Mobile Money Transfer (MMT) and Online Money Payment (WEB) Technologies. Shares of these electronic payment technologies have increased continuously since inception (Nigerian Inter-Bank Settlement System report, 2018).

Banks are profit oriented businesses as such, their growth is dependent on profitability and through different other measures. This study thus evaluates the implications of electronic banking transactions in the profitability and sustainability of banking businesses in the 21st century and beyond.

Modernity comes with its implications, and such is the case of technological innovations in banking with its concomitant diverse implication on customers, operations, and profitability (Nwankwo, 2018). Ugwueze & Nwezeaku, (2016) asserts that innovations in information and communication technology (ICT) have made banking environment so dynamic for rapid changes. Thus, banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. With the advent of technology, its lofty acceptance and assumed high advantage, it is observed that there are still periodic systemic distresses owing to their allergic vulnerability to dynamic changes in the economy (Abu, Halilu & Olukoga, 2019). For instance, within a short space of time (2018-2019), banks like Sky and Diamond have been acquired by other banks. On the part of the society, the high rate of adoption of the innovations for settlement of payments over time, have exposed customers to more risks such as internet fraudsters and incomplete transactions, among others. These, no doubt, have led to micro and macro-economic volatility, which in turn may have adversely affected the efficiency of banks to some extent.

The banking industry generally intermediates between the economic sectors and because of their critical role of financial intermediation within the economy, they are highly regulated. The banking sector thus, faces a myriad of issues ranging from high regulations, customer satisfaction, insider abuses, to adverse implications of e-transaction that have culminated in impediment to efficiency and by implication in profitability (Abu, Halilu & Olukoga, 2019).

The role of the E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies on bank profitability has been neglected in the course of implementation of e-transaction policies. That is the reason why the sector has not been able to perform up to expectation. Had these E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies payment achieved their aims and objectives in Nigeria banking industry, the country could have not only succeeded in its cashless economy programme but could have been a major partaker in e-transaction through cashless banking. This calls for empirical investigation of how possible e-transaction policies will such as E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies payment will promote economic growth through bank profitability in Nigeria looking at the current situation of Nigerian economy and the quest to enhance cashless economy by increasing the level of e-transactions.

Consequently, this study seeks to analyze the effects of e-Transactions on the Profitability of Commercial Banks in Nigeria. The specific objectives are to:
(i)   To investigate the effect of E-cheque payment on profitability of Commercial Banks in Nigeria.

(ii) To determine the effect of Automated Teller Machine (ATM) payment on profitability of Commercial Banks in Nigeria.

(iii) To assess the effect of Point of Sales (POS) payment on profitability of Commercial Banks in Nigeria.

(iv) To ascertain the effect of Mobile Money Transfer (MMT) payment on profitability of Commercial Banks in Nigeria.

(v) To examine the effect of Online Money Payment (WEB) Technologies payment on profitability of Commercial Banks in Nigeria.

To achieve these study objectives, the following hypotheses were raised in their null form as follow;

Ho1: E-Cheque payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

Ho2: ATM payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

Ho3: POS Payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

Ho4: MMT payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

Ho5: WEB payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

2.1 Review of Literatures

This section reviews the theory that underpins this study, alongside some conceptual issues; majorly on electronic transaction (payment) and bank profitability. Also, reviewed are few selected relevant empirical studies in the relevant areas.

2.1.1 Conceptual Review

E-Transaction: According to EMA (2016) E-transaction, e-commerce, e-wallets – all those financial terms could be grouped under one category called electronic. Letter "e" is just the shortening of "electronic", in effect basically everything which is done

91

electronically or online. E-transaction hence means a business process where money is transferred electronically from one place into another. It could be through internet banking, ATM, from stock exchange trades or just an invoice completion for some service/goods. Nowadays almost all transactions are classified as electronic transactions. INETCO (2020) said, the term "transaction" is used by most people to describe everything from a stock trade to the transfer of money or goods involving people, businesses, accounts, or applications such as ATMs and POS terminals.

Profitability: Profitability is the ability of a business to earn a profit. A profit is what is left of the revenue a business generates after it pays all expenses directly related to the generation of the revenue, such as producing a product, and other expenses related to the conduct of the business activities (Study.com, 2019). Investopedia (2019) in a different view says Profitability is closely related to profit – but with one key difference. While profit is an absolute amount, profitability is a relative one.

2.2 Empirical Review

The current pace of the Nigerian banking industry profitability and the attendant e-transaction calls for a review of extant literature to identify gaps and possibly fill spaces. Literature on e-transaction in the Nigerian banking industry is reviewed here. Nwankwo and Agbo (2021) investigated a study on the effect of electronic banking on the performance of Nigerian commercial banks. The study adopts ex-post facto research design and covers the period 2013 to 2017. The results of the study reveal that automated teller machine transactions have positive and significant effect on the performance of commercial banks in Nigeria while both point-of-sale terminal transaction and mobile banking transactions have negative and weak effects on the performance of commercial banks in Nigeria. The study recommends that the management of banks should adopt such innovations in their operations as would shore up their profitability. **This study failed to**

state the econometric tools used for the analysis and the scope of 5years used was too small to give a good result hence it created a research gap. The study also used only ATM, POS, and Mobile banking transaction without stating what was used as proxy for performance.

Chondough (2021) examined a study on the implication of the CBN cashless economy policy channels on the performance of Nigerian banks with specific attention on the effect of automated teller machine, point of sales and web- based transaction on earnings per share. Vector error correction model was used to estimate quarterly data collected on the variables from 2010 to 2018. Findings reveal that automated teller machine, point if sales and web-based transaction had a long-run effect on earnings per share. **The study failed to show the short run effect of result which vector error correction model (VECM) is supposed to measure. The long-run effect the study presented was supposed to come from cointegration test not VECM. The result also did not show the direction/sign of the result whether positive or negative which is a research gap.**

Also, Muotolu & Nwadialor (2019) completed a 6-12 year investigation on how the overall financial performance of deposit money banks was hampered by CBN's cashless coverage in Nigeria. The study applied the panel data techniques. Financial performance was measured using the return on asset of selected banks. There was evidence that led to the conclusion that only ATM was statistically significant for measuring financial performance in Nigeria. **Although this study considered ATM as tool for CBN's cashless policy, but the framework for the study was built on performance. It is not shown whether the sufficient condition for e-transaction hold or not.**

Abu, Halilu and Olukoga, (2019) examined E-banking payments system and commercial banks performance in Nigeria. E-cheque,

93

ATM and POS were proxies for E-banking payments while measure of profitability such as Return on Equity (RoE) is used as proxy for commercial banks performance. Ex-post-Facto research design was adopted, and analysis of an Auto Regressive Distributed Lag (ARDL) estimated, using Ordinary Least Square (OLS) approach. The result of analysis indicates that current values of ATM, E-cheque and POS are statistically significant at less than 0.05. The beta coefficient values of E-cheque and POS are positive but that of ATM shows a negative value. This study, however, rejects the null hypotheses, and concludes that about 67% influence on bank performance in Nigeria can be influenced by the variables of study. The study recommend that commercial banks should collaborate to enhance their overall performance, while individual banks should see the need to constantly develop an innovative mindset, creating an enriching environment, and engagement in reflective innovative practices to enhance their profitability. **The web transaction which shows the level of mobile banking transaction from the perspective of e-banking service is ignored, which makes it impossible to validate the study results.**

Nwankwo and Eze (2018) in their study, Problem and Prospect of Electronic Payments in a Cashless Economy applied a descriptive research design. The study indicates that the electronic system of payment has a great implication in cashless economy of Nigeria. It was concluded that e-payment system should be pursued vigorously to get people so used to it, in order to enhance cashless economy policy. This is because; bulk of the Nigerian economy is driven by SME and petty traders. To retain this policy of cashless economy in Nigeria, the authors recommended that the migration of our payments system towards a cashless society would require some reforms and a lot of effort and sensitization especially for low-income group, who are currently deeply rooted in using cash as a convenient and easy way of receiving and making payments. The sensitization exercise would require the combined effort of various stakeholders, including government, financial institutions, clergy, and non-bank providers of

94

payment services. **This study relied on hearsay to make its conclusion while we utilized econometric tools in our analysis.**

Obiekwe and Anyanwaokoro (2017) investigated the Effect of Electronic payment Methods (EPM) on the profitability of commercial banks in Nigeria. To achieve the study objective, Automated Teller Machine (ATM), WEB Payments (WEB) and Mobile Payment (MPAY) were considered as independent variables against profitability of commercial banks in Nigeria. A total sample of five (5) banks was considered for the period 2009 to 2015 and the study adopted Panel Least Squares (PLS) estimation technique as analytical tool. Findings were that Automated Teller Machine (ATM) and Mobile Phone payment have significant effect on the profitability of commercial banks in Nigeria. However, Internet (WEB) has an insignificant effect on commercial banks' profitability in Nigeria. The study recommended, among others, that commercial banks in Nigeria should sponsor media campaigns in order to boost the awareness of Automated Teller Machine (ATM) payment and Mobile Phone payment methods so as to further increase their profitability. **This study adopted panel data regression which is not suitable for the study and ignored ordinary least square and error correction model which is the major estimation tools for such study.**

Taiwo and Agwu (2017) investigate the roles e-banking adoption has played in the performance of organizations. The study objective was to determine the role of e-banking on the operational efficiency of commercial banks in Nigeria. Primary data were obtained by administering questionnaires to staff of four purposively selected banks (Ecobank, UBA, GTB and First bank). The study used Pearson correlation method of analysis through Statistical Package for Social Sciences (SPSS) and it was observed that banks' operational efficiency in Nigeria since the adoption of electronic banking has improved compared to the era of traditional banking. This improvement was noticed in the strength of banks, revenue, and capital bases, as well as

in customers' loyalty. It is concluded that with the introduction of new channels into their e-banking operations, there was a drastic increase in bank performances. And that, the more active customers are with electronic transactions, the more profitable it is for the banks. **The study used selected banks and primary data but ignored the use of panel data. Also, none of the e-banking indicators was used which invalidates the result and cannot be relied on.**

Babatunde and Salaudeen (2017) examine the impact of electronic banking on banking and non-banking financial institutions. The paper uses both the primary and secondary data to elicit information from forty (40) respondents. It employs both descriptive and inferential statistics alongside simple frequency counts, percentages, and the Chi-square for data analysis. Findings show that 22 credit officers or 62.9% of respondents agree with the opinion that electronic banking system has made banking transactions easier, 11 credit officers representing 31.45% strongly agree, while 2 of them representing 5.7% are undecided and none of the respondents either disagree or strongly disagree. The paper concludes that the adoption of electronic banking has enhanced the bank's efficiency, making it more productive and effective. The paper therefore recommends that the Nigerian banking sector must be focused on terms of their needs and use the right technology to achieve their goals, rather than acquiring technology of internet banking because other banks have it. **This study ignores necessary conditions for electronic banking investigation and adopts hearsay as means of data collection.**

Gap in studies
This particular study is a unification of two separate studies; both having profitability of the banks as a dependent variable and while one used; POS, ATM and MMT, the other used; E-Cheque, ATM and POS. Thus, the literature gaps that were found in the two studies were fuse in this study. More so, the two studies in their methodologies adopted time series data, but this study adopted a panel data analysis to bridge

the methodological gap. More so, a theoretical gap was identified, prompting this study to part way in a choice of innovation theory of profit. This is simply to say that there were three identified gaps – the literature, methodological and theoretical gaps. This is done to enable a robust results and findings for this study.

2.3 Theoretical Framework

The theoretical framework adopted in this study is the Diffusion of Innovations (DOI) theory developed by Rogers in 1995. The three assumptions of the theory are that it should be diffused and adopted by all members of a social system, it should be diffused more rapidly, and it should be neither reinvented nor rejected. It is essentially an idea, practice or object that is perceived to be new by a person or adopting entity. Innovation is transmitted through diffusion and adoption. Diffusion entails communicating or spreading of the news of the innovation to the group for which it is intended. Adoption, however, is the commitment to and continued use of the innovation (Oluwafemi, 2011).

Rogers' diffusion of innovation theory postulates that diffusion of innovation occurs as potential users become aware of the innovation, judge its relative value, and decide based on their judgment, implement, or reject the innovation and seek confirmation of the adoption or rejection decision. The theory consists of three components: 'the innovation decision process, characteristics of an innovation and adopter characteristics (Bates, Manuel, and Oppenheim, 2007). The 'innovation decision process' categorizes the steps an individual takes from awareness of an innovation, through the formulation of an attitude to the innovation, on to the decision as to whether to implement, into five: knowledge, persuasion, decision, implementation, and confirmation. The characteristics of an innovation have an impact on the likelihood of acceptance and adoption, and also on the rate at which this process develops. These innovation characteristics can also be classified into five criteria:

97

compatibility, complexity, observability, relative advantage and trialability.

The relevance of this theory to the study is that the earlier people accept e-transactions in commercial bank, the earlier it improves business activities and in turn encourage economic growth in Nigeria through bank profitability. This theory is also suitable for this work in the sense that e-transaction in this era of global transformation is viewed as an innovation for organizations to achieve their stated objectives or for nations to achieve economic transformation especially in area of bank profitability.

3.0   Methodology of Study/Model Specification

This study adopts a time- series data regression model. Secondary data on aggregate performance of banks in Nigeria using values of Return on Equity (RoE) as proxy and E-transaction on the other hand, using Automated teller Machine (ATM) Electronic Cheques (E-Cheques) Point of Sales (POS), Mobile Money Transfer (MMT) and WEB Payments E-cheque as proxies were sourced. These data were collected from Federal Reserve Economic Data (FRED, 2017) and the Central Bank of Nigeria (CBN) Statistical Bulletin of 2021 respectively. The data were between 2010 and 2020, giving 11-year period of observations. Auto Regressive Distributed Lag (ARDL) using Ordinary Least Square (OLS) approach was estimated.

Multiple regression which is an extension of simple linear regression was adopted in this study with the help of ARDL ECM model. It is used when we want to predict the value of a variable based on the value of two or more other variables. The variable we predicted is called the dependent variable (or sometimes, the outcome, target, or criterion variable).

An Autoregressive Distributed Lag Model is considered as:

(ARDL (1,1) model: $y_t = 1y_{t-1} + ox_t + 1x_{t-1} + u_t$

Where y_t and x_t are stationary variables, and u_t is a white noise.

ARDL Model equation is the same as the conventional ARDl model, including a specific restriction. The restriction is that the coefficient on the x(t-1) variable is equal to 0. Where the ARDL model is:

$Y_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t-1} + \mu_t \dots$ **(1)**

Using the ARDL model:

$$\Delta y_t = \alpha_{1,0} + \sum_{i=1}^{p} \alpha_{1,i} \Delta y_{t-i} + \sum_{j=0}^{q} \beta_{1,j} \Delta x_{t-j}$$

$$+ \sum_{k=0}^{r} \gamma_{1,k} \Delta er_{t-k} + \eta_{1,t}$$

where Δ represents the first difference of the variables, p and n are the lag lengths and the et is a scalar mean error term.

The ECM form model is often reparametrized into another form, an autoregressive-distributed lag (ARDL) model in the levels of the variables. Note that reparameterization merely alters the form in which an equation is written, but without imposing any further restrictions on it. The ARDL model corresponding to is

$$Y_t = \gamma_1 X_{1,t} + \gamma_2 X_{2,t} + \gamma_3 X_{1,t-1} + \gamma_4 X_{2,t-1} + \gamma_5 Y_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots \textbf{(2)}$$

Equation (2) is an ARDL (1,1) model (sometimes written as ADL(1,1)) as it includes a first order (AR=1) autoregressive process in the dependent variable Y, and a first order distributed lag (DL=1) in the two regressor variables, X_1 and X_2 . However, the dynamics of the adjustment process might require higher order AR or DL lag lengths. Usually, an economic researcher has no prior information about the required lag lengths, and this decision must be data-based, using a 'general-to-specific' modelling strategy.

To achieve the specific objectives of our study, we modified the equation as follow:

ROE=F (E-CHEQUE, ATM, POS, MMT, WEB) … (3)

Where;

ROE is the Return on Equity at current period in Nigeria.

E-CHEQUE is the sum of E-cheque transactions done in the banking sector in Nigeria

ATM is the volume of automated teller machine use in Nigeria at current period;

POS is the Point-of-Sale payment.

MMT is the Mobile Money Transfer payment

WEB is the Online Money Payment Technologies

The model can also be transformed as follows:

$ROE = \beta_0 + \beta_1 E\text{-}CHEQUE + \beta_2 ATM + \beta_3 POS + \beta_4 MMT + \beta_5 WEB + \mu$ **… (4)**

Where; β_0 to $\beta 5$ are the parameter of the coefficient and μ the error term.

A Priori Expectation according to the Diffusion of Innovations (DOI) theory states that the earlier people accept e-transactions in commercial bank the earlier it improves business activities and in turn encourage economic growth in Nigeria through bank profitability. In essence, e-transaction represented by e-cheque, ATM, POS, MMT and WEB transaction are expected to have a positive relationship with bank profitability in Nigeria.

4.0 RESULTS AND ANALYSIS

Diagnostic Tests

In order to ensure the validity and reliability of data used, it was subjected to tests such as; Stationarity, linearity, Homoskedasticity and so on to ensure the data set agrees with the assumptions of linear regression.

Table 1: Pre and Post Analysis Tests

Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.38137	**0.0004**	6	57
ADF - Fisher Chi-square	37.6714	**0.0002**	6	57
PP - Fisher Chi-square	44.3908	**0.0000**	6	60

Breusch-Godfrey Serial Correlation LM Test:

F-statisti		0.894247	Prob. F(1,6)	**0.3808**
			Prob.	
Obs*R-squared		1.556510	Chi-Square (1)	**0.2122**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic		0.831800	Prob. F(5,6)	**0.5708**
			Prob.	
Obs*R-squared		4.912690	Chi-Square(5)	**0.4266**
			Prob.	
Scaled explained SS		1.794398	Chi-Square(5)	**0.8768**

Ramsey RESET Test	Value	Df	Probability
t-statistic	5.106886	6	**0.0022**
F-statistic	26.08028	(1, 6)	**0.0022**
Likelihood ratio	20.11779	1	**0.0000**

The unit root test with the probability values less than 5% (0.0004, 0.0002 and 0.0000) is an indication that there is no unit root in the data set at first difference. The LM Test also indicates that there is no serial correlation among the residuals of the data set with the probabilities for F-statistic and X^2 greater than 5% (0.3808, 0.2122). With the Breuch Pagan test showing probabilities for F-statistics and X^2 greater than 5%, is an indication that the data set is homoskedastic. A specification test known as Ramsey Regression specification error test (Ramsey RESET) was also conducted as a post regression test. The test probabilities for T-statistic, F-statistic and Likelihood ratio are all less than 5% level of significance, hence showing that the data set for analysis possess no non-linear combination or that the model does not suffer from omitted variables.

ARDL ECM RESULT

The Error Correction Model (ECM) result shows how the system adjusts to the long-run equilibrium implied by the co-integration equation 2. A crucial question concerning the ECM is about the optimal lag for the right-hand-side variables. Hendry's (1987) methodology of "general-to-specific was employed via stepwise regression procedure (through the elimination of those variables and

their lags that are highly not significant), before finally arriving at an interpretable model. The elimination process is carried out until the coefficient of the error correction term ECT(-1) has the expected negative sign, less than unity and it is highly significant at the 1.0 percent level of significance. Accordingly, this led to an initial estimation of an ECM with three lagged differences of the explanatory variables, a constant term and error correction term lagged one (ECMst-1). The dimensions of the parameter space are then reduced to a parsimonious ECT specification by using omitted and redundant variable test to exclude the statistically insignificant lags.

The main purpose of error correction model is to indicate the speed of adjustment from the short run to long run equilibrium state. Co-integration relationship has been established among the variables, and then Error Correction Mechanism is used for this exercise to determine the behaviour of E-transaction on bank profitability in Nigeria. This is because the greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short run to long run equilibrium. As noted, the ECM is meant to tie the short-run dynamics of the co-integrating equations to their long-run static dispositions.

Table 2: ARDL ECM Result
ARDL Error Correction Regression
Dependent Variable: D(ROE)
Selected Model: ARDL(4, 4, 4, 3, 4)
Case 1: No Constant and No Trend
Sample: 2010 2020

Included observations: 11

ECM Regression
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1))	-0.395531	0.228526	-1.730793	0.1217
D(ROE(-2))	-0.387880	0.133406	-2.907521	0.0197
D(ROE(-3))	-0.536512	0.179379	-2.990946	0.0173
D(E-CHEQUE)	0.538541	0.153904	2.984526	0.0006
D(E-CHEQUE(-1))	0.210432	0.077990	2.698203	0.0271
D(E-CHEQUE(-2))	-0.302700	0.087660	-3.453124	0.0087
D(ATM)	0.035499	0.060232	0.589365	0.5719
D(ATM (-1))	-0.379399	0.076059	-4.988226	0.0011
D(ATM (-2))	-0.473085	0.092312	-5.124876	0.0009
D(POS)	0.285643	0.136298	-4.987367	0.0023
D(POS(-1))	0.463285	0.092617	-3.674932	0.0004
D(POS(-2))	0.347639	0.184903	-2.783562	0.0017
D(MMT)	0.095630	0.139082	0.687579	0.5112
D(MMT(-1))	0.832749	0.205026	4.061672	0.0036
D(MMT(-2))	0.489667	0.206253	2.374110	0.0450
D(WEB)	0.120569	0.147756	0.816003	0.4381
D(WEB (-1))	0.703613	0.193392	3.638267	0.0066
D(WEB (-2))	0.226122	0.190831	1.184932	0.2700
CointEq(-1)*	-0.284409	0.058774	-4.839063	0.0013

R-squared	0.932464	Mean dependent var		0.308824
Adjusted R-squared	0.814275	S.D. dependent var		3.066866
S.E. of regression	1.321690	Akaike info criterion		3.648364
Sum squared resid	20.96238	Schwarz criterion		4.636009
Log likelihood	-40.02218	Hannan-Quinn criter.		3.985179
Durbin-Watson stat	2.506320			

* p-value incompatible with t-Bounds distribution.
Levels Equation
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E-CHEQUE	1.423187	0.563984	2.982374	0.0003
ATM	1.314723	0.664469	2.978607	0.0032
POS	1.653527	0.673954	2.983657	0.0045
MMT	-1.192529	0.763633	-3.561652	0.0370
WEB	-0.822669	0.645304	-2.274856	0.0436

EC = ROE - (1.423*E-CHEQUE 1.3147*ATM 1.653*POS -1.1925*MMT - 0.8227*WEB)

Source: **Extracted from EViews 10 Output** 2022

As expected, the EC term, here represented as **Coint Eq (-1)**, is negative with an associated coefficient estimate of −0.284409. This implies that about 28.44% of any movements into disequilibrium are corrected for within one period. Moreover, given the very large t-statistic, namely −4.839063, we can also conclude that the coefficient is highly significant. The short-run coefficients estimate show the dynamic adjustment of all variables. The short run coefficients for E-CHEQUE, ATM, POS and MMT has significant effect on ROE in lags 1 and 2; WEB also has significant effect on ROE in lag 1. In summary, the short run coefficients for E-CHEQUE, ATM, POS, MMT and WEB are statistically significant at the 5% level. The coefficient of error correction term ECM (-1) estimated at -0.284409 is highly significant indicating that the bank profitability, e-cheque transaction, automated teller machine, internet banking and computerized system control are cointegrated. The estimated value of the coefficient indicates that about 28.44 percent of the disequilibrium in bank fraud detection is offset by the short run adjustment in the same quarter.

Moreso, the parsimonious model is free of serial correlation going by the value of the Durbin-Watson statistics of 2.51. The coefficient of determination (R-square) which was used to measure the goodness of

fit of the estimated model, indicates that the model is reasonably fit in prediction, that is, 93.25percent change in ROE was due to E-CHEQUE, ATM, POS, MMT and WEB collectively, while 6.75percent unaccounted variations was captured by the white noise error term. It showed that E-CHEQUE, ATM, POS, MMT and WEB had strong and significant effect on the BFD in Nigeria.

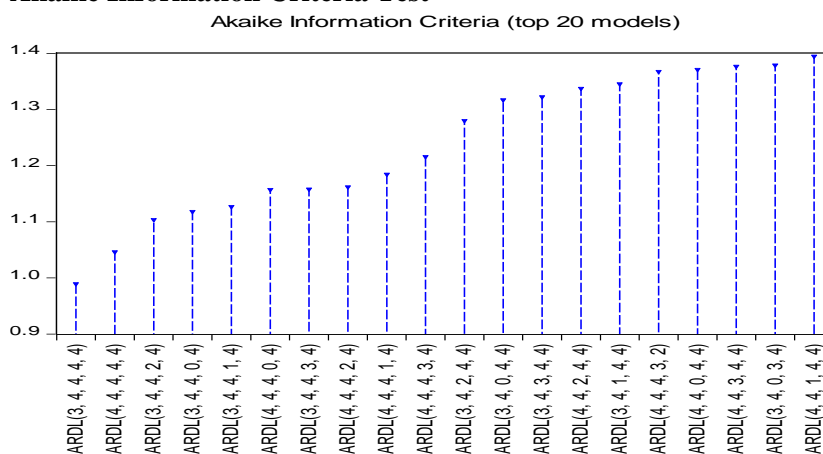**Akaike Information Criteria Test**

Figure 1: Akaike Information Criterion (AIC)

The Akaike Information Criterion (AIC) graph above shows the model selection value for the twenty best estimated models with the lowest criterion value. To achieve parsimony, the model with the least AIC, that is ARDL (3, 4, 4, 4, 4) is selected to determine the error correction and long run models.

To verify whether the residuals from the model are serially uncorrelated, in the estimation view, we proceed to Residual Diagnostics/Serial Correlation LM Test and select the number of lags. In our case, we chose 4. Here's the output

105

Table 3: F-Bounds of ARDL Co-integration Test for BFD

t-Bounds Test		Null Hypothesis: No levels relationship		
Test StatisticValue		Signif.	I(0)	I(1)
t-statistic	-6.534622	10%	-1.62	-3.26
		5%	-1.95	-3.6
		2.5%	-2.24	-3.89
		1%	-2.58	-4.23

Source: **Extracted from EViews 10 Output**.

The T-statistic value 6.534622 is evidently below the I(0) critical value bound. Our analysis of this series indicates that we fail to reject the null hypothesis that there is no equilibrating relationship. Since the null hypothesis is that the residuals are serially uncorrelated, the T-statistic p-value of 6.534622 indicates that we will not fail to reject this null. We therefore conclude that the residuals are serially correlated.

4.1 Hypotheses Testing

Hypothesis testing is the use of statistics to determine the probability that a given hypothesis is true or not. Thus, in testing the hypothesis, P-values of the t-statistics in ECM are employed. The results from ARDL ECM in tables 2 above were extracted in testing the five hypotheses set in this study. The statistics adopted in doing this include the Error Correction Model coefficient of determination paired with the arising t-statistics, Durbin-Watson Statistic, F-Statistic, R-Squared, Adjusted R-squared and the respective probability value of t-statistics. This is because t-test assesses whether individual contributions of the explanatory variables are significant and can as well be used as a basis for testing the hypothesis on the effect of independent variables on dependent variable.

Decision Rules: Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). It implies that the estimated variable has significant impact on the dependent variable.

Hypothesis 1: The table 2 above indicates the short run equilibrium of E-cheque on Bank Profitability in Nigeria. The short run dynamics of E-cheque on Bank Profitability in Nigeria showed that e-cheque has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0003] and a one percentage increase in e-cheque leads to 1.42 increases in bank profitability. This means that e-cheque has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of e-cheque on the level of bank profitability in Nigeria.

Hypothesis 2: The table 2 above indicates the short run equilibrium of automated teller machine (ATM) on Bank Profitability in Nigeria. The short run dynamics of automated teller machine on Bank Profitability in Nigeria showed that automated teller machine (ATM) has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0032] and coefficient of 1.314723. In effects, a one percentage increase in automated teller machine leads to 1.31 increases in bank profitability. This means that automated teller machine (ATM) has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of automated teller machine (ATM) on the level of bank profitability in Nigeria.

Hypothesis 3: Table 2 above also indicates the direction of effect between point of sale (POS) and Bank Profitability in Nigeria. The

short run dynamics of POS on Bank Profitability in Nigeria shows that point of sale (POS) has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0045] with coefficient of 1.653527. This means that point of sale (POS) has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of point of sale (POS) on the level of bank profitability in Nigeria.

Hypothesis 4: That Mobile Money Transfer (MMT) payment channel has significant and negative effect on banks profitability in Nigeria as shown in table 2 above. The short run dynamics of Mobile Money Transfer (MMT) on Bank Profitability in Nigeria shows that Mobile Money Transfer (MMT) has a significant and negative effect on bank profitability in Nigeria (ROE) [sig. = 0.0045] with coefficient of - 1.192529. This means that Mobile Money Transfer (MMT) has negative and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and negative effect of Mobile Money Transfer (MMT) on the level of bank profitability in Nigeria.

Hypothesis 5: WEB payment has no Significant Effect on banks performance in Nigeria. The result in table 2 as shown above has indicated that MMT has a probability value of 0.0436 and coefficient of -0.822669 which is less than the 5% level of significance, signifying that; WEB payment channel is significant to affect profitability of banks in Nigeria. Hence, this study rejects the null hypothesis but rather accepts the alternate hypothesis which states that there is significant and negative effect of WEB payment on the level of bank profitability in Nigeria

5.0   CONCLUSION AND RECOMMENDATION

CONCLUSION

This study is about E-transaction in the 21st century banking and beyond. Data were sourced through the central bank of Nigeria and were diagnosed accordingly. The first treatment was the pretests as shown in table 1, which all shows that the data are free of any form of ambiguities. The subsequent ARDL regression result as shown in table 2 indicates that the model of this study is fit. The coefficient of determination (R^2) is 0.932464 or (93.25%) while its corresponding adjusted R^2 is 0.814275 or (81.43%), indicating that 81% of the response variable can be influenced by the explanatory variables. The Durbin Watson of 2.5 is a confirmation of absence of serial autocorrelation among the residuals of the explanatory variables. It is however interesting to also note that, the testing of hypotheses has indicated that of all the five hypotheses, only two variables appear to have negative significance. This also is an indication of the model of fitness. Careful observation of the results in table 2 above also indicates that all the explanatory variables, E-CHEQUE, ATM, POS, MMT and WEB have significant effect on the profitability of the banks in Nigeria within this study time. These may be adduced to some levels of frauds perpetrated in the use of the channels. However, the ATM and the Mobile (MMT) channels have shown a positive effect on their profitability.

The usage of e-transaction can lead to lower costs, but the effect on profitability in banking industry remains inconclusive, owing to the possibility of e-transaction effects that arise as a result of consistent high demand of skilled work force, issues of increasing demand to meet customers' expectations for customer service delivery, trustworthiness of the information system and competition in financial services. However, from the discussion whilst reviewing literature, many researchers found e-transaction challenging for the delivery of

customer service profitability among banks in Nigeria. We, therefore, conclude that there is significant effect of e-transaction variables such as E-CHEQUE, ATM, POS, MMT and WEB on bank profitability among Nigerian banks.

RECOMMENDATIONS

Based on our findings and conclusions from our study, the following recommendations were made, and they include:

1. Since ATM usage has a positive and significant effect on bank profitability in Nigeria, there is the need for government to encourage the level of ATM usage as it is one of the easy ways to increase the level of profitability in Nigerian banking industry.

2. Banks should invest in all the channels of electronic payment to ensure that the economy, just like the developed economies fully and seamlessly operates a cashless economy. It is obvious that the fundamental of every development economy is to make the banking sector stable and sustainable enough to drive its economy.

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