



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 22, 2021

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



9 772668 779000

Examining the Determinants of eBanking Adoption: Evidence from Nigeria

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Abstract. The trend of transacting in raw cash is giving way to electronic payment systems as a digital lifestyle is increasingly acceptable worldwide. In Nigeria, several empirical studies have investigated the determinants of electronic banking (eBanking) on urban bank customers. However, no study, to the best knowledge of the researchers capture the rural bank customers. This study intends to fill this gap by examining the determinants of eBanking adoption in the rural area of Kano State, Nigeria. A survey design was employed and the data were collected through an electronic questionnaire distributed to 198 respondents. Partial Least Structural Equation Modelling (PLS-SEM) using SmartPLS Version 3.3.3 was employed in analyzing the hypothesized relationship based on a modified Technology Acceptance Model that introduces Trust and Quality of Internet Connection. The study found that Perceived Usefulness was the construct that overwhelmingly influences rural bank Customers to adopt eBanking. It was further revealed that the Quality of Internet Connection is vital to Rural Bank Customers. Future research opportunities, implications for practitioners and limitations were also discussed.

Keywords. eBanking adoption, Nigeria, Kano, Trust, Quality of Internet, Perceive Ease of Use

1. Introduction

Globally, the advancement of information and communication technology is becoming vital for the progression of industries and businesses. Towards the end of the 20th century, the internet and World Wide Web have significantly transformed the way financial institutions offer their services to their teeming customers. Traditionally, except for Telephone Banking, every customer is required to be present at the Bank for any transaction. Traditional banking which has been in existence since time immemorial is the most convenient method of carrying out banking transactions in both developing and developed countries (Udjoe, Anim & Nyanyofio, 2015). Due to limited operating hours and lack of sufficient branches, this archaic method of banking leads to long queues and slow operational processes and delays in transactions.

Today, most banks have established an online presence in the form of platforms such as mobile banking, internet banking in which they offer their services 24-7-365 (Al-Somali, Gholami, & Clegg, 2009). These innovations lead to improvement in customer satisfaction, reduction of operating and administrative cost as well as increase in market share.

In the quest to catch up with global breakthroughs to strengthen the standard regarding their service delivery, Nigerian banks have substantially invested in digital & telecommunication networks technology allowing them to deliver a wide range of useful products and services. Thus, the banking industry in the country has shifted from blue-collar to computerised platforms within the last few years.

There have been numerous studies related to eBanking and its adoption in developed countries, for instance (Cudjoe et al., 2015; Mwiya et al., 2017; Oni & Ayo, 2010), in North America (Kolodinsky et al., 2004; Lassar et al., 2005). Further studies were conducted in Europe (Karjaluo et al., 2002; Littler & Melanthiou, 2006) in Asia (Murali, Raman, Richard, Stephanaus, Nafis, Alam, Mudiarsan, 2010) and Australasia (Sathye, 1999).

However, a critical look at eBanking extant literature revealed that a small number of studies had investigated the determinants of eBanking adoption in Nigeria and especially the customers in rural areas.

In their study of eBanking adoption in Nigeria, Chiemekwe, Ewuekpaefe, and Chete (2006) found inadequate operational facilities, insecurity including telecommunications facilities, and power shortage to be the major stumbling block in embracing Internet banking in Nigeria. As of then, banks only have platforms where customers get information with little or no less interactivity or Internet transactional services. Likewise, Agboola (2006) examined eBanking and telebanking systems in Nigeria. His study found that cash transactions are on the decline with the steady departure from cash to automated payments. In the same vein, Oladejo and Dada (2008) studied the effect of information technology on insurance firm services in Nigeria and established that the phenomenon was accountable for the viable improvement in the efficiency and effectiveness of insurance. Similarly, Inegbedion (2018) opined that what entices and fascinates Bank customers to eBanking is the ease of doing transactions and the availability of this system twenty-four hours seven days a week.

To date, no study in Nigeria has looked into these neglected customers. For that reason, the primary goal of this study is to look at the causes that lead to the adoption of the system by rural Bank customers. Understanding this could support the Bankers to reach an informed decision with regards to the growth and development of the Bank

In general, it is believed that eBanking has been received positively by customers, but could this be true about Nigeria? Our study attempts to answer this interesting question

The rest of the paper is presented as thus: the next section discusses the extant Literature dissecting the concept of eBanking at large and in the Nigerian context. This section also provides insight as to what theories underpin this study, the contextualisation as well as the hypotheses formulation. This is then followed by the Materials and Method section where the questionnaire, sampling, and the data collection method are discussed extensively. The penultimate section then follows with the data analysis method deployed and the discussions of the findings. Finally, the implications, suggestions for future studies and conclusion are presented.

2. Literature review

The concept of eBanking

Electronic Banking is defined “as the provision of banking services to customers through the internet” (Daniel, 1999). It could be broadly classified into Internet banking, Smart

card banking and Mobile/telephone banking (Agwu, 2018; Agwu & Carter, 2014; Inegbedion, 2018a).

When the internet and World Wide Web were born in the mid-'90s, banks began to introduce eBanking where customers have the chance to the bank from the comfort of their homes (Salehi & Alipour, 2010). Offei and Nuamah-Gyambrah, (2016) added that, ever since, the banking industry has seen tremendous transformations in terms of innovation and usage of information systems and development in electronic commerce. eBanking emergence has served as an advantage for e-commerce due to the fact that businesses are settled with fewer hassles and within the nick of time (Hossain, Irin, Islam & Saha, 2013). With the advent of eBanking, national or international transactions are settled speedily; thus bridging the gap that exists between the bank and customer.

Recently, eBanking has received positive approval from customers. The tremendous increase in the approval of eBanking lies in its benefits over the conventional method of consumer banking (Inegbedion, 2018). Sciglimpaglia and Ely (2002) study found that Banks with no eBanking systems are susceptible to loss of customers to rivals with such systems. Additionally, this phenomenon offers a lower-cost framework than the conventional banking system (Hamidi, 2009).

2.1 eBanking in Nigeria

According to Odumeru (2017), the most widely used medium of eBanking in Nigeria is the Automated Teller Machine (ATM). Other media of eBanking Services offered by banks in Nigeria are Mobile banking, internet banking etc. Of all e-banking services offered in Nigeria, ATM is by far the most popular in Nigeria (Olalekan, 2011). According to the Nigerian Communications Commission (NCC), as of the third quarter of 2018, the internet users in Nigeria stood at 111.6 million from 100 million users recorded at the beginning of the year (Adeyemi, 2019). This figure represents over 50 per cent of the country's population. The data also showed that overall internet users increased from 100 million showing an increase of 11.6 million. (premiumtimesng, 2018).

For better financial inclusion, the Central Bank of Nigeria has pegged the number of ATM units needed at 60,000. However, the country falls short of this projection by CBN as ATMs deployment across the country is less than one-third of the desired total. According to a report by Nigeria Inter-Bank Settlement Scheme (NIBSS), the number of ATMs in Nigeria stood at 17,398 in 2017 with First Bank had the highest ATMs (2,779), followed by United Bank for Africa (1,750) and Access Bank (1,564) (Kayode, 2017). Kayode further added that more than 73% (12,261) of the ATMs in Nigeria are owned by only 12 commercial Banks (Kayode, 2017). To understand the momentum eBanking is gaining, the total value of cash dispensed by ATMs for First Bank in 2016 to both its customers and other Banks's was N2.6trillion, which is a 23% increase from N2.1 trillion dispensed in the year before (Kayode, 2017).

Despite the giant stride of banks in eBanking, few challenges such as scams and e-fraud make some customers feel unsafe about this system of banking. Hence, trust was added as a construct in this study to determine its effect on shaping the mind of customers to adopt eBanking.

2.2 Underpinning theories

It is critical to refer to theories in order to have a robust and rigorous underpinning for the research. With a little modification, this study adopts the TAM model.

According to Davis (1989), the Technology Acceptance Model proposes that the use of an Information System depends on the Perceived Ease of Use and Perceived Usefulness. As per Davis (1989 p. 985), is “PU is the degree to which a person believes that using a particular system would enhance his or her job performance”. On the other hand, Perceived ease of use (PEOU) refers to the “degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 985). Davis further added that these two variables or constructs (PEOU and PU) create a favourable behavioural intention (BI) in using the Information Technology which influences its adoption or use consequently (Davis et al., 1989)

Mathieson (1991) posits that the TAM has a better tendency to explain users’ attitudes and intention towards using Information Technology than then TPB and TRA. In light of this, the present study would use TAM.

2.3 Development of Conceptual Framework

Previous studies have found TAM to be superior to other models with regards to determining the factors that predict adoption and intention to adopt eBanking (Yousafzai, Foxall, & Pallister, 2010; Yousafzai, Pallister, & Foxall, 2003). Due to their findings, which shows the importance of the trust construct, they recommended that it should be added in understanding behaviour and eBanking. The TAM originally encompasses PU and PEOU, which then determines the attitude toward usage. Attitude toward usage positively influences the intention to use, which is a replication of the loyalty of users.

The present study has adapted the TAM model and thus uses the quality of the internet, Perceived usefulness, perceived ease of use and perceived trust as exogenous

Constructs to determine attitude as shown (Figure 1). From the framework, the researchers posit that the attitude prompts intention which in turn determines the actual adoption of eBanking

2.3.1. Quality of internet and attitude to eBanking

Quality of internet connection is fundamental to the success of eBanking and its adoption. According to Al-Somali, Gholami and Clegg, (2009) eBanking would have been impossible without a high-quality internet connection.

The financial institutions are not responsible for the quality of the internet connection (Kumbhar, 2014). However, the Service quality of eBanking depends on the quality of internet service provided by the telecommunication department or service providers. Accordingly, in her (1999) study, one of the first to examine the quality of the internet as a determinant of eBanking adoption, Sathye posits the quality of internet connection to be one of the essential determinants in adopting eBanking. The author used Internet access as one of the factors affecting the adoption of online banking in her research. That is, the connection of the internet, which is of impeccable quality, leads to the adoption of eBanking.

Conversely, poor or slow connectivity of the internet could expunge the patronage or adoption of eBanking (Kumbhar, 2014). Similarly, Al-Somali, Gholami and Clegg (2009), Pikkarainen (2004) submits that connection quality is a vital determinant for any application that is Internet-based. In 2005, a study by Almogbil as cited by (Al-Somali, Gholami, & Clegg, 2009) found a positive correlation between the speed of Internet connection and the use of eBanking.

Hence, hypothesis one is presented as thus;

H1: There is a positive relationship between the Quality of internet connection and attitude towards eBanking.

2.3.2 Perceived usefulness and attitude towards eBanking

According to Davis (1989), perceived usefulness in relation to technology use “refers to consumers’ perceptions regarding the outcome of the experience. If the outcome were beneficial or useful, then the user would have a positive attitude toward the use of that technology”. Similarly, other scholars define perceived usefulness as the “extent to which a person deems a particular system to boost his or her job performance (Lee, Lee & Kim, 2007)”. For eBanking, perceived usefulness takes into account whether or not purchasers find it more cost-effective, convenient, lithe & highly effective. This as well indicates that if customers find user-friendly self-service technologies offer them higher self-sufficiency in carrying out banking trades, in acquiring financial information on financial advice, and in purchasing other financial products, they are more to be expected to have an affirmative mindset in the direction of such technologies. Empirically, scholars recommend that purchasers who seem to find eBanking to be useful are more probably to have a positive mentality toward eBanking adoption (Mohammadi, 2015a; Sundarraj & Manojehri, 2013). Based on these viewpoints, the research study postulate as follows:

H2: *Perceived Usefulness positively influences attitude towards eBanking.*

2.3.3 Perceived ease of use and attitude towards eBanking

According to Davis (1989 p.320), Perceived Ease of Use refers to the “degree to which a person believes that using the relevant technology would require minimal effort or better still effort-free”. Based on this definition, Mwiya *et al.*, (2017) argue that the Perceived ease of use on its own does not determine whether or not an individual would adopt an innovation but rather, helps in shaping a positive attitude towards it. Similarly, Davis (1989) echoed the stance by Mwiya by submitting that when a technology is user-friendly, it would have a favourable effect on the user in addition to creating a favourable attitude towards using it. Numerous empirical studies for instance (Lee *et al.*, 2007; Sikdar, Kumar & Makkad, 2015) found that perceived ease of use is an essential determinant of a favourable attitude toward eBanking. Thus, hypothesis three is presented;

H3: *Perceived Ease of Use positively influences attitude towards eBanking.*

2.3.4 Trust and attitude towards eBanking

Trust and Attitude toward eBanking Trust is defined as the “reliance on and the confidence in the integrity, strength, ability, surety of a person, a system or thing(Gupta & Kamilla, 2014; Zhou, 2014)”. Trust in e-commerce, and online transactions have been identified to be of utmost importance (Yousafzai *et al.*, 2003). As per Suh and Ha (2002), customers take the issue of trust more imperative in an online scenario when compared to physical banking. With regards to eBanking, there are four elements of trust, which are; authentication, security, authorisation and integrity (Yousafzai *et al.*, 2010). Security refers to the “protection of information exchanged during electronic transactions from the threats and risks of transactional integrity, authentication, and authorisation”. Transactional integrity is an assumption that the data is certainly not generated, obstructed, transformed, or eradicated illegitimately. Authentication assumptions guarantee consumers that only authentic transactions will be executed. Lastly, authorisation belief determines that the parties to an eBanking transaction are exactly as they proclaim to be. No one strives to be conned from his or her nice income. Doubtlessly researchers advocate that trust is a vital consideration for individuals within the approval or rejection of e-banks or e-commerce technology (Gupta & Kamilla, 2014). The reason being, it may favourably affect the attitudes of potential consumers & their satisfaction with finance interrelated technology (Zhou, 2014).

Dependent on these considerations, the researchers posit the following:

H3: Trust influences attitude towards eBanking positively

2.3.5 Attitude towards eBanking and Intention to adopt eBanking

The impact attitude on Intention is threefold: negative-positive, and or neutral (Shbiel & Ahmad, 2016). This means that attitude is statements considered to be evaluative and could be favourable or unfavourable towards phenomena, persons, places or things. Studies have found the attitude to have a positive relationship with eBanking adoption (Mohammadi, 2015a). Similarly, attitude towards an invention is considered as a vital intervening construct in technology adoption decisions (Davis, 1989). In an information system, Intention to use is affected by the user's attitude. As a result, attitude toward innovation is conceptualised as a prospective customers' verdict of their intent to use or adopt the innovation (Davis, 1989). This means that, if the attitude of a prospective customer is positive, then it is expected that there would be a favourable intention to adopt. Otherwise, the intention to adopt will be unfavourable.

Empirical research has shown that the higher the positive attitude, the greater the intention to adopt eBanking (Lee et al., 2007; Wu, Jayawardhena, & Hamilton, 2014). Hence, the following hypothesis is H6: Attitude towards eBanking leads to the positive intention of adopting eBanking

2.3.6 Intention to adopt eBanking and eBanking adoption

As per Davis (1989) behavioural intention is defined as "the degree to which a person has formulated conscious plans to perform or not to perform some specified future behaviour". Mwiya *et al.*, (2017) posit that, concerning technology and innovation, the intention is determined by the positive or adverse attitude of users and their discernment concerning its effectiveness.

Similarly, Ajzen, (2011) holds the same view as their study suggest that the greater the intent, the more likely that the behaviour is executed. Based on empirical data related to eBanking, studies have found individuals who have higher intentions to adopt eBanking are more probable to use its services (Al-Ajam, Ali Saleh., Md Nor, 2015; Bruce Mwiya, Felix Chikumbi, Chanda Shikaputo, Edna Kabala, Bernadette Kaulung'ombe, 2017; Oni & Ayo, 2010; Ronaghi, 2010). Hence, hypothesis six is grounded based on the observations in 0.

H6: Intention to adopt eBanking is positively related to eBanking adoption.

Conceptual Framework

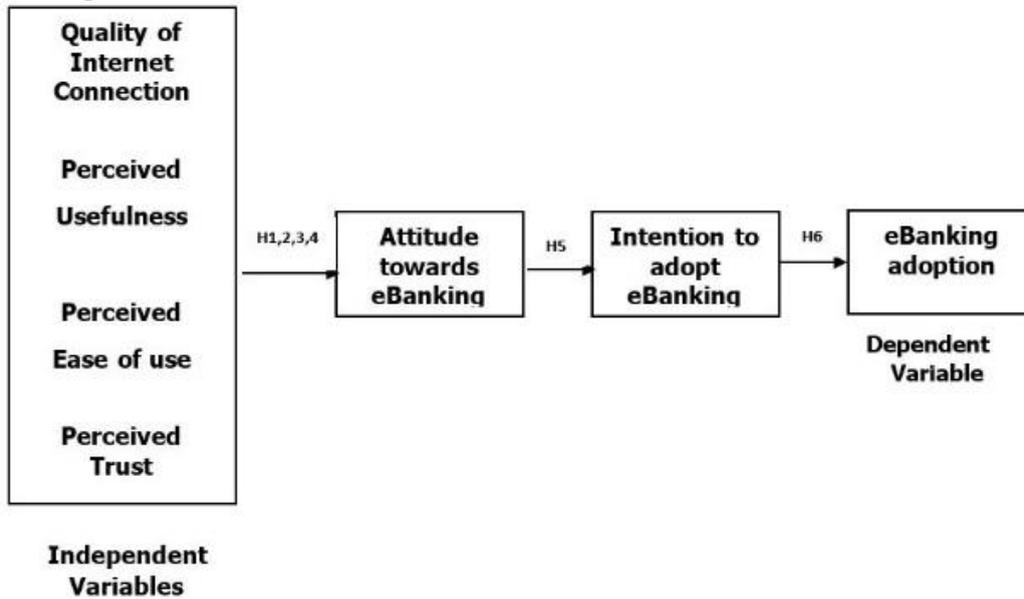


Figure 1 Research Framework.

3. METHODOLOGY

3.1 Study Location

Kano State, the most populous state in Nigeria according to the official census held in 2006, was the desired target location for this study. With several banks operating branches in its forty-four Local Governments Area (LGAs), the focus of this research would be mainly on the under-researched rural regions of the state. Of the forty-four Local Government Areas in Kano, six are in the metropolis; the banks situated in the city centre would not be sampled. Hence, only thirty-eight local governments situated at the outskirts of the state would be of concern to this study. According to the researchers' findings, as of 2019, out of the 36 Local Government Areas that are outskirts of Kano state, only 10 (Wudil, Dambatta, Gwarzo, Rano, Gezawa, Kura, DawakinTofa, Takai, and Bichi) have bank branches amongst them. Thus, only those Local Governments Areas with Banks are considered in this study.

3.2 Measurement Scales

The sets of questions administered to participants have been adapted from several extant studies. All indicators other than the demographic profile of the respondents were measured using a Five-Point Likert scale ranging from Strongly Disagree represented by (1) to Strongly Agree denoted by (5). On the other hand, the demographic variables which include gender, age, Aspect of eBanking, eBanking Tools, Internet Access Locations, income, education etc., were adapted from (Chong, 2013). Similarly, the Independent variables - the Quality of the Internet was adapted from (Al-Somali, Gholami & Clegg, 2009; Raman, Stephenaus, Alam, & Mudiarsan, 2010; Bhushan, 2016) the Perceived Ease of Use and Perceived Usefulness from (Davis, 1989). Likewise, Attitude was adapted from (Venkatesh, Morris, Davis, Gordon & Davis, 2003) and Trust from (Al-Somali et al., 2009; Riffai, Grant, & Edgar, 2012). Finally, for the dependent variable of eBanking adoption, the items were adapted from (Kumar et al., 2015; Mwiya et al., 2017). For the framework of this study, forty-one (41) indicators were used.

3.3 Sampling Method

This research employed a “*probability sampling technique using Cluster Sampling.*” Probability sampling necessitates sample frames, units, to swirl respondents with known probability, for example, a school register.

In cluster sampling, the researcher divides the population into separate groups, called clusters. Then, a simple random sample of clusters is selected from the population. All banks with branches in LGAs outskirt of Kano Municipality were identified and all respondents are required to have an account in one of the identified branches given to be able to participate in the survey.

One hundred and ninety-eight (**198**) respondents based on a medium effect size of (**0.15**) and (**95%**) confidence interval level are substantial for this research. Hair, Hult, Ringle & Sarstedt (2014) recommends the use of Gpower to determine sample size. In this regard, numerous studies in behavioural social sciences have used Gpower in determining sample sizes for instance Abdurrahman, Owusu & Bakare, 2020; Abdurrahman & Osman, 2017; Bakare, Owusu, & Abdurrahman, 2017; Farooq, Khalil-ur-Rehman, Younas, Sajjad & Zreen, 2018; Owusu, Agbemabiese, Daha & Bakare 2017: 2020).

The eligibility criteria for participating in the survey are as thus:

- *The respondent must be a resident in Nigeria;*
- *The respondent must have a Bank Account;*
- *Must reside in the rural area of Kano state;*
- *Respondents must be Youth aged (18-34) years.*

Once the respondents fulfilled these criteria, he or she is eligible for the survey and the researcher proceeds to solicit for participation.

3.4 Data Collection and Response Analysis

Since the current study’s questionnaire was administered online via several social media platforms such as Facebook, Whatsapp and Telegram via Google Form, it is impossible to determine the number of people contacted. However, the desired number of responses was achieved.

4. Data Analysis and Interpretation

4.1 Demographic Profiles of Respondent

The summary of the descriptive statistics of the demographic profilers of respondent’s (**n=198**) is presented in the table below. The subsequent parts shall provide a detailed analysis of the findings statistically.



Variable	Item	Frequency	Percentage
Gender	Male	96	50%
	Female	3	1.5%
	Prefer not to say	99	48.5
Age (Gen Y)	18-25	72	48.3%
	26-30	30	36.4%
	31-35	96	15.2%
Educational Level	Bachelor's Degree	143	72.2%
	Diploma	12	6.1%
	Masters	33	16.1%
	PhD	7	3.5%
	Secondary School	3	1.5%
eBanking use	Yes	193	97.5%
	No	5	2.5%
Type of eBanking Use	Personal	157	79.3%
	Business	37	18.7%
	Both	4	2%
Type of Bank Account	Savings	159	80.3%
	Current	26	13.1%
	Both	13	6.6%
Aspect of eBanking	Point of Sale	5	2.5%
	Automated Teller Machine (ATM)	10	5.1%
	Online Banking	9	4.5%
	Mobile Banking	22	11.1%
	ATM & Mobile Banking	80	40.4%
	Online Banking & POS	2	1%
	All of the above	70	35.4%
eBanking Tools	Point of Sale	5	2.5%
	Mobile Phone	82	41.4%
	Tablets	3	1.5%
	Laptop or Computer	4	2%
	Mobile Phone & Tablet	2	1%
	ATM & Mobile Banking	57	28.8%
	Mobile Phone & PC	11	5.6%
	All of the above	39	19.7%
Level of computer literacy	Expert	24	12.1%
	Advanced	73	36.9%
	Intermediate	85	42.9%
	Beginner	16	8.1%
	Don't know how to use a computer		
Internet access Location	All of the above	181	91%
	At home	24	12.1%
	At School	9	4.5%
	In the internet cafe	1	0.5%
	Mobile Phone	1	0.5%
	Mobile Data	2	1%

Figure 2 Demographic Profiles

An overview of the gender distribution statistics; shows that one hundred and ninety-eight (198) respondents participated in the survey. Figures obtained indicates fifty per cent were males, while forty-nine per cent were women. The other one per cent prefer not to reveal their gender. Further analysis shows that forty-nine-per cent of the respondents are aged between 20-25 years whereas thirty-six-per cent were aged 26-30 years. The remaining fifteen per cent were aged 31-35 years. On the Educational Level of the respondents seventy, two per cent were reported to have a bachelor's degree, while sixteen per cent have a Master's Degree. The remaining twelve per cent have lesser degrees.

An overwhelming response on the usage of eBanking was received where ninety-eight per cent of the respondents have indicated that they use eBanking in one way or the other.

Similarly, eighty per cent of the respondents indicated that they own a saving account while the remaining twenty per cent reported they own both current and savings accounts. Of the one hundred and ninety-eight respondents who have answered the question on the aspect of eBanking they used, forty per cent reported that they used eBanking via ATM and Mobile. Likewise, eleven per cent of the respondents submitted that their aspect of eBanking is via Mobile Banking. From the findings, it is evident that the remaining percentage goes to the respondents who use all other aspects of eBanking namely; Point of Sale, Automated Teller Machine (ATM) and Online Banking Mobile Banking, ATM & Mobile Banking and Online Banking & POS.

On the eBanking tools used by the respondents, the findings show that forty-one per cent access the eBanking platforms via Mobile Phones and Computer, meanwhile twenty-nine per cent access the platforms via the ATM and Mobile. Furthermore, twenty per cent were reported to use all tools and means to engage in their eBanking endeavour. The penultimate question on the demographic profile asked the respondents about their computer literacy. Interestingly, only twelve per cent were experts. Astonishingly, forty-three per cent have advanced knowledge of computer literacy while thirty-four are on the Intermediate level. The remaining twelve and eight percents are Beginners and those who don't know how to use a computer respectively.

Finally, the last question on the demographics demanded the location where respondents access the internet. The finding shows that the majority (eighty-seven per cent) of the one hundred and ninety-eight access the internet from their mobile phone from every location they are from.

4.2 Inferential statistics

Evaluating and assessing PLS-SEM occurs in two (2) different stages in succession; the first stage involves the evaluation of the measurement model (*Reflective or Formative*) via indicators and constructs. In the second stage, researchers evaluate the structural model between the constructs. This helps in analysing a theoretically established model by forming how well the new analysis fit the new model (Hair et. al., 2014a; Kline, 2011).

Part I: Assessment of Measurement Model

There were (41) indicators/items in this research, twelve(12) of the items/indicators were below the (0.50) acceptable threshold; therefore, the researchers deleted them to improve the model's convergent validity. All other indicators/items retained attained the minimum loading of (0.50/0.40) threshold after establishing the presence of convergent validity as recommended by (Hair et. al., 2014a p.121).

Internal Consistency reliability (Composite Reliability)

All variables and indicators in this study satisfied the minimum values required to establish the presence of reliability. The composite reliability of all constructs had achieved the needed threshold value of (0.70) or above. Figure 3 indicates findings obtained for reliability analysis by running the PLS Algorithm function in SmartPLS (SPLS). The result of the assessment of the internal consistency reliability is a composite alpha value. Variables reliability coefficients have to surpass the (0.70) threshold (Hair 1998; Rossiter, 2002). However, Nunnally (1978) and Srinivasan (1985) recommended values of (0.50) to be adequate for initial variable development. Furthermore, Van de Ven & Ferry (1980) noted that adequate values might be as little as (0.40) for substantially outlined variables. The composite reliability

and Cronbach's alpha values for the analysed variables were run by SmartPLS, the result of which ranges from (0.753 to 0.890) and (0.701 to 0.892), respectively.

Convergent Validity

In this study, all factor loadings show the presence of convergent validity as all loadings were above (0.5) as explained in the section. Likewise, all constructs recorded composite reliability of (0.70) and above. Lastly, the AVE for all constructs was accessed to establish the presence of convergent validity; the result is presented in Figure 3.

Constructs	No. of Items	AVE	R Square	Cronbach's Alpha	Composite Reliability	Discriminant Validity
Quality of Internet Connection	6	0.505	-	0.753	0.701	Not detected
Perceived Usefulness	5	0.595	-	0.829	0.841	Not detected
Perceived Ease of Use	5	0.560	-	0.737	0.751	Not detected
Trust	6	0.574	-	0.850	0.824	Not detected
Attitude	5	0.657	0.592	0.859	0.888	Not detected
Intention to Adopt	5	0.821	0.604	0.890	0.892	Not detected
eBanking adoption	8	0.518	0.452	0.839	0.870	Not detected

Figure 3 Summary of PLS quality Criteria

Part II: Evaluating the Structural Models

The structural model evaluates the constructs and the causal relationship whose significance value appears on the arrow from a given exogenous variable to the endogenous variable, the values are also known as the '*Path coefficient*' – "are estimated path relationships in the structural model (i.e., between the constructs in the model). They correspond to standardised betas in regression analysis" (Hair et. al., 2014a). The first step in evaluating a Structural Model is assessing it for collinearity. The second step is to check the correlation and relevance of the Structural Model, followed by the significance level of R^2 . The third step is to assess the effects of sizes or f^2 .

Assessing Structural Model for Collinearity

Collinearity "arises when two indicators are highly correlated. When more than two indicators are involved, it is called multicollinearity" (Hair et al. 2014a p. 115). Researchers' obtain collinearity results by assessing and evaluating the VIF values and the tolerance level. When the tolerance levels range is less than (0.20), and the VIF is more than (5.00) for the predictive variables, it is then established that the collinearity problem is present.

To solve collinearity issues, the researcher needs to examine the items with high VIFs. Not a single variable surpassed the recommended (5.00) threshold; this suggested there were issues of collinearity detected

Assessing the significance and relevance of Structural Model relationships

T-Value bootstrap significance for all causal correlations was greater than the (>1.96), significantly relevant at (10%) level. This research span across different fields such as advertising, management and marketing, heeding to hair's recommendation, the researchers settled for (1.65) as the benchmark for determining significance at the (10%) level. However, to accept or reject any hypothesis, the P-Value must be below (0.01). All relationships were below the (0.01) thresholds except PEOU, Trust to Attitude, which had a P-Value of (0.183, 0.122) respectively which is not significant.

Relationships	Path Coefficient	T Values	Significance Status	P-Values
Quality of Internet Connection -> Attitude	0.187	2.284**	0.022	Significant
Perceived Usefulness -> Attitude	0.494	4.986***	0.00	Insignificant
Perceived Ease of Use -> Attitude	0.094	1.333 (NS)	0.182	Not Significant
Trust -> Attitude	0.115	1.547 (NS)	0.122	Not Significant
Attitude -> Intention to adopt	0.777	19.011***	0.00	Significant
Intention to adopt -> eBanking adoption	0.672	9.932***	0.00	Significant

Note: NS= Not supported *p<0.01, **P<0.05 ***P<0.000

Figure 4 Summary of Path coefficient, bootstrapping p values results

Assessing the level of R^2

R^2 value “is an inner model assessment technique that represents the amount of explained variance of each endogenous latent variable” (Joseph F. Hair, Ringle, et al. 2012). For each dependent variable predictor, the value of R^2 starts from (0 to 1), the closer to one (1), the better the accuracy of predicting the R^2 value. The scale of (0.25) signifies “weak/small” predictive accuracy, while (0.50) and (0.75), denotes “average/moderate”, and “substantial” predictive accuracy (Hair et al. 2014a). Based on the results obtained, the endogenous latent variables of attitude and intention to adopt an R^2 value of (0.592, 0.604) respectively that indicates moderate significance, and eBanking adoption that has an R^2 value of (0.452) indicating weak significance.

Assessing the effect of f^2

The impact of f^2 size is a measure of the effect of a particular independent variable on any dependent variable. The f^2 impact size allows the researcher to evaluate the independent construct's incremental explanation associated with a dependent variable, as a result offering evidence for the model's predictive capabilities. F^2 size effect regarding exogenous construct ranges from (0.35) for “large” impact, (0.15) is used to denote “medium” size effect, lastly, (0.02) is used to denote “small” effect (Hair et al. 2014a). The researchers obtain the value of f^2 every time a given exogenous variable is omitted from the model. The results obtained showed that all constructs have a small effect size on the mediator and dependent variable, although expertise had a small effect, the construct obtained the highest effect size, indicating its importance. In simple terms, the f^2 “shows how much an exogenous latent variable contributes to an endogenous latent variable’s R^2 values (Wong, 2013, p. 26).” Going by this clarification, the Intention to Adopt construct would have a severe effect on the R^2 if omitted from the model compared to other constructs

Assessing the predictive relevance Q^2 effect size

The blindfolding procedure to assess the cross-validated redundancy approach was used to calculate Q^2 values. All the dependent variable indicators indicated values above zero. As a result, confirming predictive significance for all endogenous latent variables, (Attitude,

Intention to Adopt, and eBanking adoption. The predictive relevance value is 0.351, 0.465 and 0.209), which implies that the model has predictive relevance for these constructs.

4.3 Hypothesis testing

In PLS-SEM, bootstrapping analysis helps in the evaluation of the direct effect of significance after the initial PLS algorithm analysis. All three direct effects were statistically significant (10%) as shown below

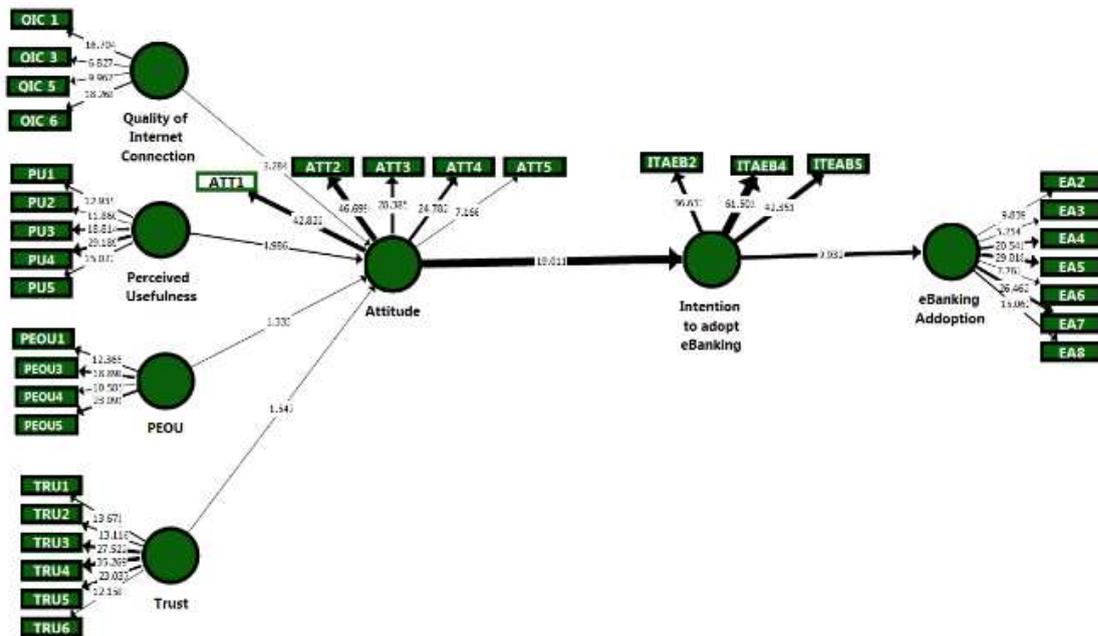


Figure 5. Bootstrapped Value

5. Discussion

Four of the six hypotheses were supported. The relationship between Quality of Internet Connection and the Attitude towards eBanking, the study found that the hypothesis for this objective *was supported*; this is in line with past studies (Al-Somali et al., 2009; Kumbhar, 2014; Pikkarainen, Pikkarainen, Karjaluoto & Pahlila, 2004).

For RH2, projecting *Perceived Usefulness positively influences attitude towards eBanking*, the correlation was *supported*. These findings raise intriguing questions regarding the nature and extent of usefulness in shaping the minds of Bank customers in the rural area. As earlier hypothesised, the finding is similar to those obtained by (Mohammadi, 2015b; Sundarraj & Manocheri, 2013).

For the H3 which determines whether or not Perceived Ease of Use influences attitude towards eBanking, the researchers found that the hypothesis for this objective is not supported. Contrary to expectations, this study did not find a significant relationship between PEOU and Attitude towards eBanking. The bootstrapped T-Value for this hypothesis was found to be statistically insignificant. This is a strange finding which not in line with past studies (Lee et al., 2007; Sikdar, Kumar & Makkad, 2015). However, the unexpected findings could be due to the fact that rural bank customers feel that usefulness matters more to them than ease, as

providing the system (eBanking) has provided ease for them. They no longer have to go to the Bank and wait long hours to perform the transaction. This in itself provides much relief to them by offering ease of doing transactions from the comfort of their houses.

Similarly, for H3 that investigate whether Trust influences attitude towards eBanking, the study found that this hypothesis was not supported. This finding was unexpected and suggested that there is no significant relationship between Trust and Attitude towards eBanking. The findings of the current study do not support the previous research, for instance (Gupta & Kamilla, 2014; Zhou, 2014). Trust is not originally included in the TAM model. The researchers only added it as other researchers have highlighted its importance. However, in this study, this construct is not supported. This finding might not be unconnected to the fact that this set of customers are not aware of issues related to TRUST (Safety, Security and Credibility) as compared to their urban counterparts who are exposed to several forms of eBanking fraud.

Evaluating hypothesis five, It can, therefore, be assumed that the attitude towards eBanking is a major determinant of intention to adopt eBanking. The correlation between these constructs returned the *highest bootstrapping T-Value* (i.e., highest correlation significance/effect). The finding is not unexpected as the result uphold the findings of the previous works of Lee et al., (2007); Wu et al., (2014b).

An overwhelming result was achieved for the last hypothesis of the study which projected that the Intention to adopt eBanking is positively related to eBanking adoption. A highly positive correlation was achieved. This finding broadly supports the work of other studies (Bruce Mwiya, Felix Chikumbi, Chanda Shikaputo, Edna Kabala, Bernadette Kaulung'ombe, 2017; Oni & Ayo, 2010; Ronaghi, 2010)

6. Conclusion and Recommendation

The primary objective of this research is to discover the determinants of adopting eBanking in Nigeria. In terms of contribution, the study is the first in Nigeria to investigate, empirically, eBanking adoption amongst the rural bank customers by modifying and enhancing Davis's Model Using PLS-SEM. The contribution broadens the body of knowledge by adding a determining construct – Quality of Internet-, which was not included in the original TAM model.

Furthermore, theoretically, the research has contributed to understanding the rural banking customers through modification of TAM. In this research, the initial TAM has been modified by incorporating the quality of Internet Connection and Trust. This addition broadens the body of knowledge by investigating these correlations, which were not included in Davis (1989) original model.

Practically, this study utilises the much-neglected bank customers residing in rural areas. Empirical evidence provided through this study should be used by Managers and other policymakers to help create awareness about eBanking in rural areas where the phenomenon is not known much. The study has shown that eBanking adoption is on the rise amongst these sets of customers. Thus, this has provided insight to managers and policy-makers that in examining evaluating the determinants of eBanking, they should look at improving PEOU and Trust as the result from IPMA have shown these construct to be important but performed weakly.

Based on the findings from the study, implications for practitioners (a framework to enhance eBanking adoption), Managerial, Theoretical contribution, future research opportunity and constraints shall also be outlined.

For Managers, findings from this study could aid them in determining the behavioural intentions of their customers with regards to the adoption of eBanking services. It is evident from the findings of these study that the rural Bank customers are more inclined towards the

perceived usefulness they get from the eBanking systems which in turns give them a positive attitude towards it that leads to high intention to use the system and finally engage in the actual act of using the system. Therefore, managers could take a cue from this finding by paying attention to make their eBanking system more useful to their customers by providing more functionalities that would add more value and attract more customers.

Further findings revealed that the rural bank customers are not too worried about trust and perceived ease of use of the system as long as the system is useful to them. That is, the customers are satisfied as long as they are able to satisfy their needs related to the banking transaction.

Finally, it is worth nothing to managers that, high-quality internet is a key determinant factor that leads the rural Bank customers to adopt the eBanking system. Therefore, since most rural areas in Nigeria have poor network/internet coverage, it is expedient that bank managers liaise with network/internet service providers to offer a qualitative network to ensure smooth access to eBanking systems.

On the other hand, every research has limitations, and this study is not an exception. The study focuses on one state in Nigeria (Kano) and its rural Bank customers (students' samples). Furthermore, the study is limited to a certain age group of youth between 18 -34 years. Certainly, there is a debate about whether or not a student sample can be used to generalise to the whole population. However, it is important to consider a larger cross-section of individuals, who are more representative of the general population for future research or even use a longitudinal research method.

All these and other bewildering limitations might have swayed the findings and ought to be managed in prospective research studies. Therefore, there appears to be an opportunity for potential research in this area, and it would probably be fascinating to assess these variables for evaluation. Even though this study has numerous constraints, by comprehending the determinants of eBanking, the research presents a starting point towards embracing prospective customers' responses to eBanking.

Future researchers could test the Model presented utilising different samples and populations from different cultures, contexts and backgrounds. Similarly, further research interest could be drawn by investigating a different category of Bank Customers' apart from the rural students' population; as such, futuristic researchers could do a comparative study to examine the attitude across the two groups via multi-group analysis.

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