



ABSTRACT

This study aimed at integrating service reliability and security as the determinants of internet banking acceptance among bank customers. The study adopted the survey research design based on quantitative approach. Structured questionnaire was used to collect data from bank

A

N INTEGRATION OF SERVICE QUALITY AND SECURITY IN THE DETERMINANTS OF INTERNET BANKING ACCEPTANCE AMONG BANK CUSTOMERS

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Introduction

The growing competition in today's market place has led to the proliferation of several new innovations and developments across industries. The banking industry is not an exception, as it continues to witness the development of new product, process and service innovations. These innovative solutions contribute to the success of banks through improved service delivery and customer satisfaction. One of such innovations is internet banking which is noted to have controlled



customers in Bauchi and Gombe states, North-east Nigeria using the convenience sampling technique. Out of the 406 questionnaires administered to the bank customers, 403 responses were retrieved back and found fit for the analysis. The collected questionnaires were analyzed using structural equation modeling. The analysis revealed that performance expectancy, effort expectancy, social influence and reliability have significant positive effect on the behavioural intention to use internet banking service while security does not. In addition, behavioural intention and security have a positive effect on acceptance of internet banking. The study contributes to the understanding of the role of service reliability and security as determinants of internet banking acceptance in a developing country; it shows the mechanism through which reliability and security influence intention and actual usage of internet banking. The findings implies that banks service reliability coupled with strong. Security protocols that prevent intruders from gaining access to customers' information will enhance the acceptance rate of internet banking systems. In addition, banks' marketing communication should not overlook the important role of technology and individual related factors as they influence intention decisions of customers.

Keywords: *Behavioural intention, effort, performance expectancy, internet banking acceptance, reliability, security, social influence*

two important parameters: time and distance (Bashir and Madhavaiah, 2015). Internet banking is defined as a facility that is used for conducting financial transaction by bank customers on a secured website (Ali, Mazen, Maged and Alan, 2015). The benefits of internet banking include enabling customers to send or transfer money, pay bills online, access online products, rates and services, make deposits and offer 24-hour customer assistance desk. A well-designed internet banking platform will enhance the level of customers' satisfaction, and consequently, increase bank profitability and performance through continual usage of the systems. Even



though, the developed economies have witnessed a considerable growing rate of the use of non-cash payments including internet banking, the developing economies such as Nigeria are lagging behind.

The Nigerian economy is characterized by huge amount of money in circulation, thus majority of its transactions are cash based (Sanusi, 2011). This is an indication of a slow adoption of non-cash payment system in Nigeria. In 2019, the Central Bank of Nigeria (CBN) equally reiterated its commitment to cashless policy by introducing charges on every bank cash transaction. The apex regulatory body also in its effort to ensure the speedy transition to a non- cash based economy, launched Payment Service Banks (PSBs) with the aim of increasing the availability of banking services by 2020 to millions of Nigerians that have hitherto have no access to financial services. The National Space Research and Development Agency (NSRDA) has in 2006, revealed a worrisome situation that the number of active internet users in Nigeria was only 2% (about 2.4 million) of the Nigerian population of over 140 million (Mohammed and Siba, 2009). The internet usage in Nigeria is dismally poor which is also reflected in the low adoption of internet banking system. Nigeria arguably has the highest number of unbanked and underserved population compared to other countries across the globe (Uduk, 2019). The Central Bank of Nigeria (CBN, 2008) recognizes that internet banking service is still at the cradle stage of development in Nigeria. Odumeru (2012) asserted that developing countries such as Nigeria are lagging behind in internet banking service operations, and an acceptable level of customers' acceptance is yet to be achieved.

An important issue in the implementation of internet banking among banks today is the acceptance decision among users of the systems (Hassanuddin *et al.*, 2015). This has been a source of primary concern to marketing researchers as they seek to understand the acceptance of these product/service (Malhotra and McCort, 2015). The concern can be seen in the extent to which many researchers have continued to examine the antecedents of behavioural intentions and acceptance of technology (Venkatesh *et al.*, 2016). Most of such studies have identified the various



determinants of actual usage behaviour particularly for technology. However, more need to be explored especially with regards to financial service institutions in developing countries. In the service industry, reliability dimension of service quality is an important determinant of customers' intention to use service products which have not been adequately examined. For example, in Nigeria, there is still a high degree of customer complaints of poor internet connectivity, increasing threat by account hackers, excessive transaction charges, and longer time to resolve customers' complaints (Nwogu and Odoh, 2015).

Security is another area concern and a lack of it exposes the customers to risk of financial loss and as such, serves as a factor that hinders the acceptance of technology-based services. It becomes imperative that a reliable service should also provide assurance to the users that their information is safe and they do not stand to incur financial loss from conducting transactions online. Security in particular should be critical additional variables to consider in measuring technology acceptance, in researches related to payment and privacy (Kanokkarn, and Tipparat 2018). To accept technology-based services like internet banking has gained acceptance in a developing country like Nigeria, the security concerns of Nigerian customers should be properly measured. To win the trust of its teeming customers, service providers must ensure they maintain confidentiality of customers' information by not sharing the personal information of the customers' with third parties through putting in place a good level of security for the customers' information.

Previous studies on the determinants of acceptance of technology were mostly focused on service business other than banking (Santonen, 2007). For example, studies abound in the areas of tourism/restaurant (Hutchinson *et al.*, 2009; Ladhari, 2009) and airline (Saha and Theingi, 2009). Furthermore, the search and review of related literature revealed that most of the studies conducted on internet banking were in countries like the United State of America (USA), the United Kingdom (UK), Spain, India and Malaysia, with few empirical studies on the subject conducted in developing countries like Nigeria (Nwachukwu, 2013). In addition, the study



became necessary because the context of the study differs from that of the previous studies in terms of orientation, economy, social conditions and cultural values. Therefore, it is presumed that there might be a significant difference in the behavioural responses of consumers in developing countries like Nigeria and those of other developed countries. In light of the few and limited studies on the determinants of internet banking acceptance that have examined the roles of service reliability and security concern of users, this study seeks to make contribution in that direction.

Literature Review and Hypotheses Development

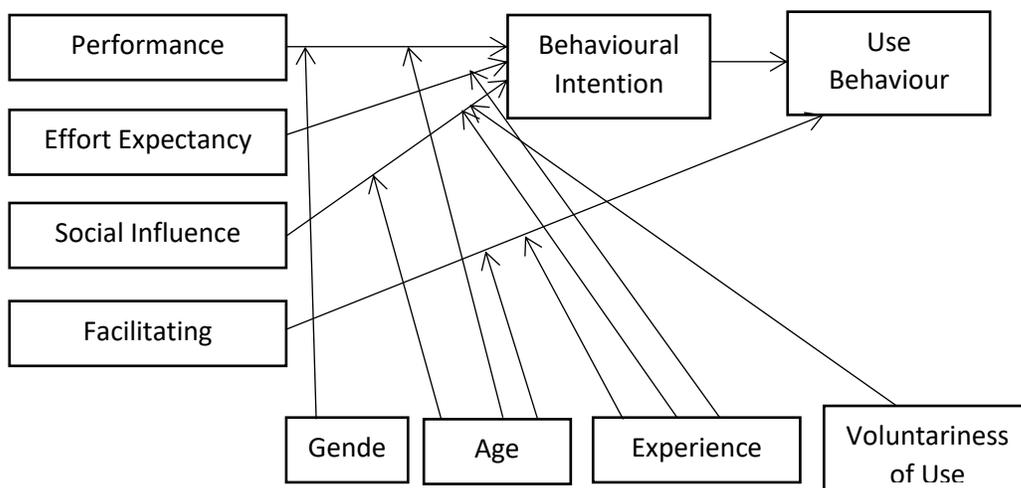
Internet banking has been defined in various ways by different scholars. It is a platform through which bank customers conduct financial transaction on website that is operated by a bank. Internet banking can also be defined as a facility through which bank customers conduct financial transaction through a secured internet (Nwogu and Odoh, 2015). Internet Banking Services enables customers to have access to their bank accounts, make transfers and enquiries and get feedbacks without visiting a bank branch. Nigeria as a country has joined the League of Nations embracing the technology, however, the adoption is low (Odumeru, 2012, and Nwogu and Odoh, 2015). Most Banks in Nigeria have deployed it in their mainstream operation but the acceptability by customers has not been clearly verified. This is despite efforts by the CBN in championing the move towards a cashless economy, which is noted to have led to a renewed interest in this wonderful but security- threatened technology.

Theoretical Framework of the Study

This study is guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh, Morris, Davis, and Davis (2003). The field of information technology acceptance research in general has yielded many, competing models, each offering different determinants of technology acceptance determinants at the time, until Venkatesh *et al.* (2003) published their ground-breaking research study. The scholars



focused on eight prominent models from which UTAUT was developed. These theories/models are: (a) the theory of reasoned action (TRA); (b) technology acceptance model (TAM); (c) motivational model; (d) theory of planned behavior (TPB); (e) a combined model using the technology acceptance model and the theory of planned behavior; (f) PC utilization model; (g) innovation diffusion theory (IDT); and (h) social cognitive theory (SCT). The quantitative study resulted in the development and empirically validated UTAUT, bringing together the eight predominant models into one theoretical framework. The theory consists of four core determinants and four moderators of behavioral intention and use behaviour (see Figure 1). The core determinants are: (a) performance expectancy; (b) social influence; (c) facilitating conditions; and (d) effort expectancy. The four moderators are: (a) age; (b) experience; (c) gender; and (d) voluntariness of use. The UTAUT was dubbed a useful tool for managers to evaluate the probability of success in implementing new technologies, to understand core determinants of acceptance and be proactive at intervening with appropriate action plans targeting users deemed less likely to adopt and use new technology systems (Venkatesh *et al.*, 2003).



Source: Adopted from Venkatesh *et al.*, (2003).

Figure 1: Unified Theory of Acceptance and Use of Technology (UTAUT)



Research Framework and Hypotheses Development

This study used the UTAUT framework to develop a research framework by introducing e-service quality variables of reliability and security to the UTAUT model of (Venkatesh, Morris, Davis, and Davis, 2003).

Determinants of Internet Banking Acceptance [IBA]

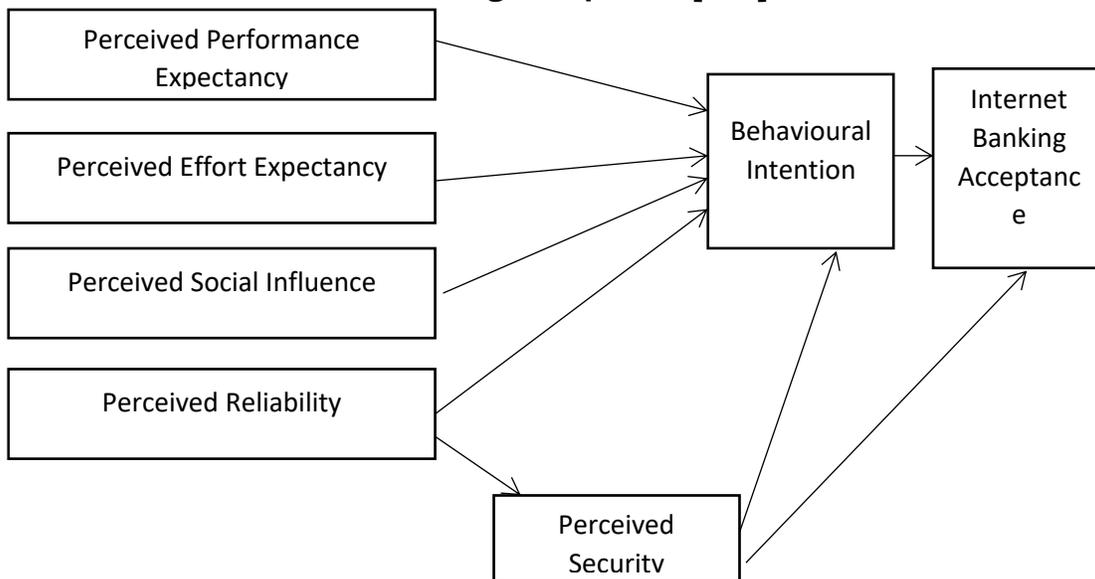


Figure 2: Framework of the Study

Source: Adopted from Venkatesh *et al* 2003 with modification.

Performance Expectancy (PE)

Performance Expectancy is defined as the benefits derived from using technology-based service like internet banking. These utilities that can be obtained from the use of a technology include lesser transaction completion time, cost savings, quick service delivery and efficient service (Venkatesh *et al.*, 2016). Therefore, intention to adopt a technology by a user is determined by the utility the user felt he/she can obtain from using the technology. The perception of the customers on how a technology based system delivers efficient service to the customers as well as serve as portable medium for performing financial transactions is a significant of behavioural intention to adopt the technology (Sarfaraz, 2017; Venkatesh *et al.*, 2016). It is logical for one to assume that Nigerian internet banking



customers expect to attain gain in performing internet banking tasks. This is further supported Oh and Park (1996) call for the refinement of theories and methodology to suit specific situations. This becomes necessary because of the difference in orientation, economy, social conditions and cultural values among consumers across nations. Viewed in this sense, behavioural responses from developing countries can be presumed to differ from that of developed countries. Previous studies found performance expectancy to have positive relationship with customers' behavioural intention (Sharma, Singh, and Sharma, 2020; Merhi, Hone, and Tarhini, 2019; Alalwan, Dwivedi, Rana, and Algharabat, 2018; Venkatesh *et al.*, 2016, Shin, 2009; and Chou *et al.*, 2018). In further confirmation of the finding, (Faqih and Jaradat, 2015; Liebana- Cabanillas *et al.*, 2017) in their own findings, confirmed that performance expectancy is an important determinant of intention to adopt mobile commerce. The study added that consumers will adopt the mobile commerce service if they are confident that the services provided by the platform is useful to them. Thus, we formulate hypothesis one as follows:

H₁: Performance expectancy has significant effect on the behavioural intention to use internet banking services in Nigeria.

Effort Expectancy (EE)

Effort Expectancy is the extent to which the users of technology found it easy to use (Venkatesh *et al.*, 2016). It is the same as Davis's perceived ease of use in TAM. It is generally agreed among experts in technology adoption models that the propensity to use a technological innovation is usually determined by the user's perception regarding ease of use of the technology. Users of any technology-based applications therefore, considers ease of use and not having to put so much effort in using the technology to be an important determinant for the use of technology. As such, for internet banking system to be accepted by bank customers, the system should be user-friendly and the design should be in such a way that it makes life easy for the users so that they are able to make transactions easily (Sarfaraz, 2017). Studies by Lee (2009) and Yoon and



Steege (2013) revealed that perceived ease of use (i.e. an equivalent of effort expectancy) have a significant influence on behavioural intention to use technology. Similarly, studies by Martins *et al.* (2014); Alalwan, Dwivedi, Rana, and Algharabat (2018); Merhi, Hone, and Tarhini (2019); and Sharma, Singh, and Sharma (2020) reported a significant positive influence of effort expectancy on behavioural intention. These studies confirmed that when users perceived that a technology such as internet banking is easy to use, they will be inclined to adopt it than when the technology is difficult for them to use. Effort expectancy is therefore an important factor of consideration in the behavioural intention to use a technology (Faqih and Jaradat, 2015). This study therefore argues that, the more user friendly a banks' internet banking system is, the more customers are likely to use and adopt it. On the contrary, the more complex it is for customers to use the internet banking system, the less likely they are to adopt it. Therefore, we hypothesized that:

H₂: Effort expectancy has a significant effect on the behavioural intention to use internet banking services in Nigeria.

Social Influence (SI)

Social Influence is defined as “a person’s perception that most people who are important to him think he should or should not perform the behavior in question” (Ajzen, 1991). This construct was originally not included in the TAM constructs by Davis (1989) as a result of theoretical and measurement problems. However, it was included in TAM2 as its importance in explaining the influence of other people in acceptance behaviour increases. Empirical evidences have shown that social influence is a significant factor in information system researches that affects behavioural intention (e.g. Venkatesh *et al.*, 2003; Venkatesh and Zhang, 2010; Tarhini *et al.*, 2013, 2014; Sharma, Singh, and Sharma, 2020) and Internet Banking in particular (e.g. Yousafzai *et al.*, 2010; Kesharwani and Bisht, 2012). This studies show that users are usually influenced to adopt an innovation by the uncertainty that will be created if they lagged behind their peers in adopting a given technology. As a result of this feeling of uncertainty, it is argued that when



others who influence the behaviour of the users such as friends, media or colleagues at work adopt a technology, the customers will also be motivated to adopt also. Study by Saleh (2008) revealed that the desire to impress and feel important in a group to which an individual belongs to influences their readiness to accept a behaviour or not. This is more so because, many people today mould their life around their role models who are either public figures, celebrities, and sportsmen. In such cases, they try to copy the behaviours of such role models. The implication is that if such role models use a particular technology, it will encourage them to use it also (Taiwo *et al.*, 2012). Nigerian society is multicultural in nature, diverse in many areas of life. It is necessary to investigate the impact of this diversity in influencing the behavioural intention to accept internet banking services. It is therefore, hypothesized in this study that:

H₃: Social influence has a significant effect on the behavioural intention to use internet banking services in Nigeria

Reliability

Reliability is the ability to perform the promised service dependably and accurately (Parasuraman and Greenwood, 1998). It is simply the ability of an organization to provide to its customers what it promises to do so and even exceed their expectations. Companies that keep to their promises will gain the patronage of more customers through repeat purchase and good words-of-mouth. To be able to provide reliable service, Dorian (1996) argued that competence and efficiency are important and highly needed. Competence in this context encompasses the knowledge of the staff about the service, skills acquired and pride which enhances their service delivery (Walker, Denver, and Ferguson, 2000). Competence can be measured in terms of the extent to which bills are handled by the staff of the organization (Larkin, 1999). Management of banks that desire to enhance the level of service delivery to their customers, must create an environment for team work so that knowledge and skills are shared, thereby increasing reliable service. The provision of a reliable service in turn will stimulate a behavioural intention to use the system. Extant



empirical studies have revealed that reliability constitutes the most important features that customers seek in evaluating their internet banking service quality (Liao and Cheung, 2002) and that when backed up by a stronger security protocols, it can lead to acceptance behaviour. Similarly, there is a strong relationship between customers' reliability on service provided and customers' behavioural intention towards acceptance of the service (Kettinger and Lee, 2005). Reliability features of technology based products are essential to consumers' use of such electronic channel (Liao and Cheung, 2002). The more reliable and secured consumer perceive internet banking to be; the more likely they will use it. Hossain and Leo (2009) found that reliability and ease of operations influence customer perception of internet banking. Consequently, we postulate that:

- H4: Reliability has a significant effect on the behavioural intention to use internet banking service in Nigeria.
- H5: Reliability has a significant effect on the security concern among internet banking service users in Nigeria.

Security

Security refers to the prevention of unauthorized access to information and systems by third parties whose access to such systems may pose a risk to customers regarding their transactions through an online banking platform. It was defined by Salisbury *et al.* (2001), as the degree to which customers' sensitive information is protected while conducting financial transaction online as perceived by the customers. Shin (2009) notes that perceived security is "the degree to which a customer believes that using a particular internet based services will be secure". The assurance of the safety of transactions through internet banking system can lead to the behavioural intention to use and accept the technology. Several studies reported a strong relationship between security and behavioural intentions. Most of such reports revealed that internet banking systems are deficient in terms of security, efficiency, service quality and ease of use which affects the level of the customers' trust in the system (Zhao *et al.*,



2010). Investigating the effect of security concern on behavioural intention to accept internet banking services among Nigerian public cannot be better than now. Previous empirical studies (e.g. Merhi, Hone, and Tarhini, 2019; Anouze, and Alamro, 2019; Juwaheer, Pudaruth, and Ramdin, 2012) found significant positive effect of perceived security on behavioural intention. This study therefore, postulates that:

H6: Security issues of internet banking services has a significant effect on the behavioural intention to use internet banking services in Nigeria

H7: Security issues of internet banking services has a significant effect on internet banking services acceptance among bank customers in Nigeria

Behavioural Intention

Bahavioural intention has been conceptualized as the degree to which the user of a self-service technology tends to use it (Venkatesh *et al.*, 2003, 2012). Several researches on technology acceptance have confirmed that behavioural intention is the most powerful determinant of acceptance behaviour among individuals and groups (Ajzen, 1991; Venkatesh *et al.*, 2003, 2012). As a result, many studies conducted in the past concluded that a precondition for the actual usage of a technology is customer intention (e.g. Martins *et al.*, 2014; Wang and Shih, 2009). Therefore, this study also argues that behavioural intention has an indirect effect on customer usage of internet banking that provides an indication about the readiness of bank customers to use internet banking service (Baron & Kenny, 1986). Recent empirical findings also revealed that behavioural intention influences acceptance/usage behaviour of information technology (Gupta, Dogra, and George, 2018; Venkatesh *et al.*, 2012) and internet banking service in particular (Baabdullah *et al.*, 2019; Martins *et al.*, 2014; Tarhini *et al.*, 2016). Therefore, this study also hypothesized that:

H8: Behavioural intention to use has a significant influence on acceptance of internet banking.



Methodology

The study adopted the quantitative approach based on the survey research design method. Survey research design involves the study of the attitudes, behaviours, opinions or characteristics of a sample of the population through questionnaire. This study adopted inferential survey with the aim of establishing relationships between variables (Creswell, 2012). The population of the study was made up of the 5,755,976 (five million, seven hundred and fifty five thousand, nine hundred and seventy six customers of seventeen deposit money banks in North East Nigeria, (EFInA, 2018). Based on the Krejcie and Morgan (1970) table for sample size determination, the sample size of 384 (three hundred and eighty –four) was determined. However, this is the minimum sample size required for the study and since there was no guarantee that there will be 100% response rate because of human behaviour and other factors, the sample size was increased by 30% to account for non-response bias/attrition (Saunders, Lewis, and Thornhill, 2016). Thus, 406 customers were used for the study. A structured questionnaire was adapted from previous studies that measured the same variables. The study however, modified some items to suit the research context and the environment (Singhry, 2018). The electronic service quality (E-S-Q) instrument developed by Parasuraman *et al.* (1988), Walker, Denver, and Ferguson (2000), Ladhari (2009) was used to measure the service quality dimension of reliability. While for the UTAUT variables (Performance expectancy, Effort expectancy and Social influence), the instrument developed by (Venkatesh *et al.*, 2012), Yoon and Steege (2013) Tarhirin *et al.* (2013, 2014) Taiwo, Mahmood, and Downe (2012)) were used. For security, the instrument developed by Mohammad and Oorschot (2017), Khalilzadeh *et al.* (2017) were used. For behavioral intention, the instrument developed by Ladhari (2009), and Santonen (2007) were used. These instruments are relevant to the study and have been tested for reliability.

The research instrument was administered to the target respondents using the personal method of questionnaire administration, with the help of some research assistants for collecting research data. These assistants



were given allowances and gift items to motivate them for the desired commitment to ensure accurate data gathering. The Customer Relation Officers of the bank were also used for the data collection since they have daily contacts with the customers of the bank. Convenience (Accidental) sampling techniques were used for distributing questionnaires to the respondents. The aim was to get some basic information quickly and cost efficiently (Singhry, 2018).

Validity and Reliability of Instrument

The validity of the research instrument was determined using both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). In EFA, principal component factor analysis with varimax rotation was used to detect the underlying dimensions. A summary of the output items and the rotated matrix is presented in Table 1. The rotation converged in seven (7) iterations. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which determines the extent to which data are appropriate for factor analyses, yielded a result of .954. A test statistic of .954 ($df = 1275$, $p < .001$), provided strong evidence that factor analysis was applicable for data analysis in this research. Additionally underscoring the suitability of factor analysis are the results of Bartlett's Test of Sphericity, which determines whether or not a relationship exists between the variables: if no relationship exists, then undertaking factor analysis is purposeless. An appropriate p-value, per Hinton, Brownlow, McMurray and Cozens (2004), should be < 0.05 when factor analysis is being considered. The p-value in this case is .000, which indicates that factor analysis presented as a highly relevant technique to employ for this research. In addition, the seven (7) components extracted have a cumulative total variance explained of 67.865% which is greater than the threshold value of 50% (Hair *et al.*, 2011) and the factor loadings were greater than the recommended 0.40 threshold (Hair, Black, Babin, Anderson, and Tatham (2006). The results showed that most of the items loaded on their intended factors except four items in which one was under Reliability of Internet Banking (i.e., RIBS5); one item under behavioural intention (i.e. BI1); one item under Performance



Expectancy (i.e. PE5) and one item under effort expectancy. These items otherwise known as nuisance items – were deleted. Thus, it can be said that, the EFA results demonstrate that unidimensionality is ensured.

Reliability and Common Method Bias

The reliability of the refined scale was assessed using the internal consistency approach by computing Cronbach's alpha. A construct with a reliability coefficient of 0.70 and above is usually highly reliable (Nunnally, and Bernstein, 1994). The construct reliability ranges between .860 and .943 which are all above the recommended threshold thereby suggesting good internal consistency.

Furthermore, common method variance was assessed through Harmon's one-factor test as recommended by Podsakoff and Organ (1986). As a rule of thumb, the test recommended that a each components should account for less than 50% of the total variance explained. Result from table 1 revealed that the seven dimensions have an initial eigenvalues greater than 1 (1.162 – 21.546), with a cumulative total variance explained of 67.865%. The first components with the highest initial eigenvalue of 21.546 accounted for 42.247%, which is lower than the recommended 50% minimum threshold and none of the components has a total variance explained of above 50% threshold. Based on the values reported on table 1, it can be seen that there was no common method bias issue.

Table 1: Rotated Component Matrix

	Components						
	1	2	3	4	5	6	7
Eigen Values	21.546	3.980	2.500	2.354	1.784	1.285	1.162
Percentage of Variance Explained	42.247	7.805	4.901	4.616	3.498	2.519	2.279
Cumulative % of Variance	42.247	50.052	54.953	59.569	63.067	65.586	67.865



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Cronbach Alpha	.930	.943	.895	.897	.860	.928	.879
IBS8	.811						
IBS10	.808						
IBS4	.782						
IBS9	.767						
IBS6	.754						
IBS5	.748						
IBS7	.710						
IBS3	.655						
IBS2	.571				.402		
IBS1	.493						
RIBS5	.479				.441		
B17		.769					
B18		.754					
B19		.736					
B110		.727					
B16		.721					
B15		.657					
B13		.615					
B14		.605					
B12		.484					
S12			.790				
S15			.779				
S14			.713				
S16			.702				
S13			.698				
S11			.671				



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B11			.442				
PE1				.766			
PE3				.745			
PE4				.710			
PE2				.704			
PE6				.603			
EE3				.485			.439
RIBS3					.816		
RIBS2					.740		
RIBS1					.733		
RIBS4	.411				.526		
RIBS6	.443				.498		
PE5					.437		
IBA5						.712	
IBA3		.414				.695	
IBA2						.651	
IBA6						.627	
IBA4		.445				.600	
IBA1						.541	
EE6							.746
EE5							.617
EE7							.597
EE2				.425			.579
EE1							.543
EE4							.533
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.							



- a. Rotation converged in 7 iterations.
- b. The Kaiser-Meyer-Olkin measure of sampling adequacy = .954 c. Approx. Chi-Square = 16962.729
- d. Bartlett's test of Sphericity df = 1275 e. Sig. = .000.

Construct Validity

The result of the refined items using exploratory factor analysis was used to perform confirmatory factor analysis (CFA) using maximum likelihood estimation approach. To establish construct validity, the convergent and discriminant validity tests were carried out based on the indicators in the measurement model. Two approaches were used in construct validation. First, the fit indices for the measurement and structural models were assessed and the values suggested that the two models have a good fit index (Bagozzi, 1993). In SEM, there is several Fitness Indices that reflect how fit is the model to the data at hand. However, researchers generally hold a divergent view regarding which fitness indexes to use. Hair *et al.* (1995, 2011) recommended the use of at least one fitness index from each category of model fit. The fit indices produced from the validation of the measurement model in CFA are presented in Table 2. Although some of the index were generally low compared to recommended fit indices values of 0.90 and above, Bryne (2001) suggested that values > 0.80 can also be considered appropriate.

Table 2: Fit Indices

Fit Index	Values Obtained		Recommended	Source
	Measurement	Structural		
Root Mean Square Residual (RMR)	.066	.091	Closer to zero	Jöreskog and Sörbom (1981)



Goodness of Fit Index (GFI)	.787	.781	>0.90	Tabachnick and Fidell (2013)
Comparative Fit Index (CFI)	.901	.897	>0.90	Bentler (1990)
Tucker Lewis Index (TLI)	.892	.889	>0.90	Garver and Mentzer (1999)
Normed Fit Index (NFI)	.848	.845	>0.90	Bollen (1989)
Incremental Fit Index (IFI)	.901	.898	>0.90	Bollen (1989)
Root Mean Square Error of Approximation (RMSEA)	.063	.063	<0.08	Browne and Cudeck (1993)
ChiSq/df	2.572	2.615	<3.00	Bollen (1989)

Secondly, to establish convergent validity in EFA, a construct must have an initial eigenvalue of above 1.0 and a factor loading of 0.30 and above (Hair *et al.*, 1995). It can be seen from table 1 that all the loadings were above the 0.30 threshold and their initial eigenvalues exceeded the minimum criterion of 1. In confirmatory factor analysis, construct validity was also assessed based on the Fornell and Larcker criterion. A measurement model was developed and assessed as presented in Figure 3. To establish convergent validity in CFA, the recommendations by Fornell and Larcker (1981) and Hair Jr *et al.* (2013) was followed in this study. First, an item loading of 0.70 and above must be obtained and the loading must be significant. However, Hair *et al.* (2014) is of the view that items whose deletion can affect the content/construct validity and composite reliability should be retained so long as they have a loading of 0.4 or more. Second, composite reliability of construct must be above 0.80. Third, the recommended average variance extracted (AVE) of 0.50 or greater must be



obtained. Results from Table 3 show that item loading of both constructs is between 0.659 and 0.848. Composite reliability of all the constructs of the study lie between 0.864 and 0.943; average variance extracted (AVE) of all the constructs of the study lie between 0.561 and 0.646. Therefore, evidences of convergent validity can be said to exist.

Figure 3: Measurement Model

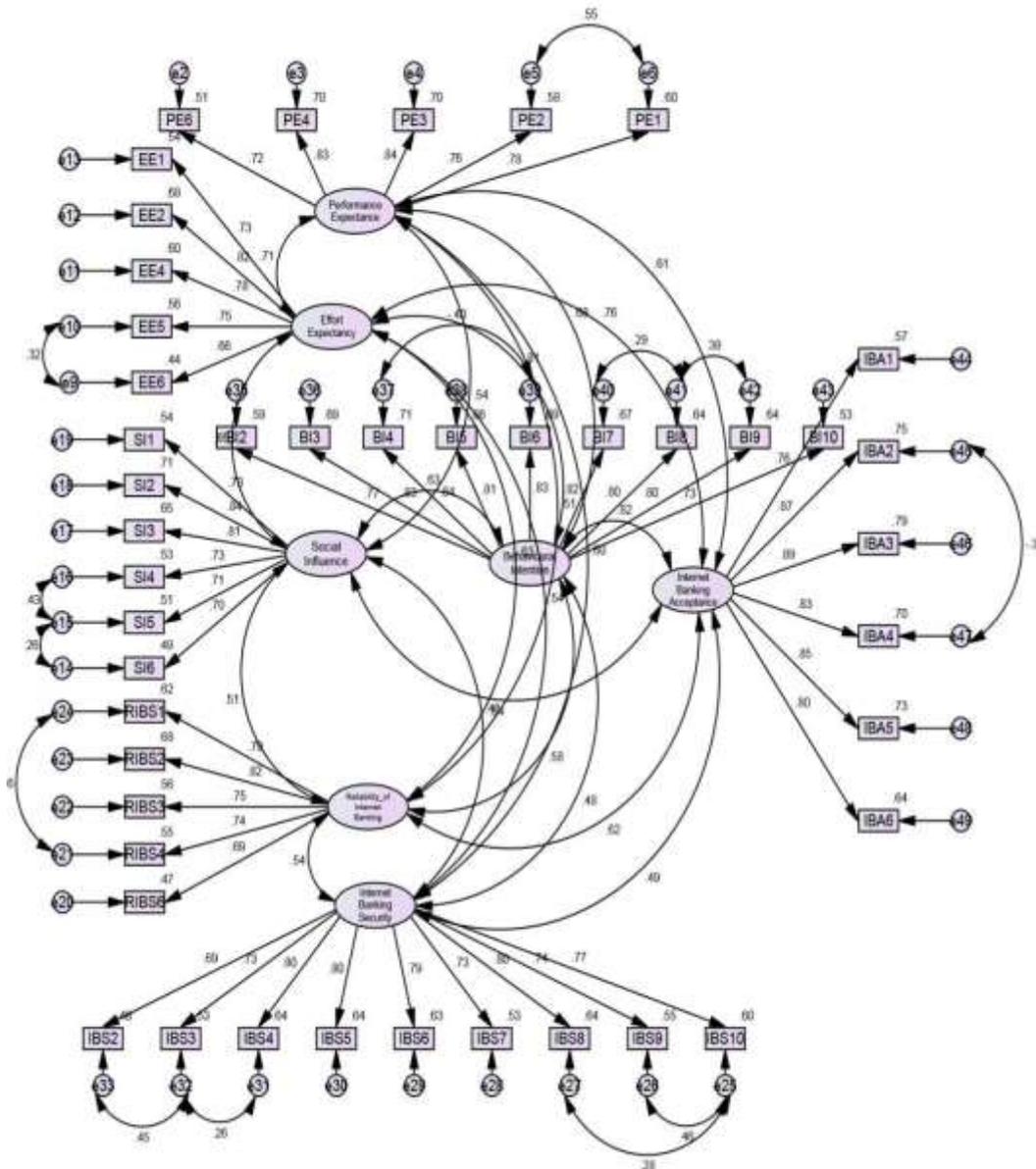




Table 3: Factor loadings of items on constructs, AVE and Construct Reliability

Constructs	Items	Factor Loadings	AVE	Construct Reliability
Performance Expectancy	PE6	.715	.619	.890
	PE4	.834		
	PE3	.838		
	PE2	.763		
	PE1	.776		
Effort Expectancy	EE6	.661	.562	.864
	EE5	.748		
	EE4	.775		
	EE2	.822		
	EE1	.732		
Social Influence	SI6	.699	.572	.889
	SI5	.713		
	SI4	.729		
	SI3	.806		
	SI2	.844		
	SI1	.735		
Reliability of Internet Banking Service	RIBS6	.686	.576	.871
	RIBS4	.740		
	RIBS3	.752		
	RIBS2	.824		
	RIBS1	.786		
Internet Banking Security	IBS10	.775	.583	.926
	IBS9	.741		
	IBS8	.800		



	IBS7	.729		
	IBS6	.795		
	IBS5	.802		
	IBS4	.802		
	IBS3	.729		
	IBS2	.692		
Behavioural Intention	BI2	.769	.647	.943
	BI3	.833		
	BI4	.842		
	BI5	.812		
	BI6	.829		
	BI7	.818		
	BI8	.802		
	BI9	.799		
	BI10	.730		
Internet Banking Acceptance	IBA1	.756	.695	.932
	IBA2	.867		
	IBA3	.890		
	IBA4	.834		
	IBA5	.852		
	IBA6	.797		

In order to test for discriminant validity, the recommendations set forth by Fornell and Larcker (1981) was followed in this study. Fornell and Larcker (1981) criterion requires a comparison between the square root of AVEs and correlations with all other constructs and discriminant validity is said to be established when the square root of the AVE for each construct is greater than its correlations with all other constructs. Put differently, the AVE should exceed the squared correlation with any other construct (Ali, Kim and Ryu, 2016; Hair et al., 2013). Based on the output



presented in table 4, the square root of the AVEs is represented in diagonal and bolded while the values at above the diagonals represented construct correlation and the values shown at the upper triangle are the square of the correlation. The values presented in Table 4 provided empirical evidence that discriminant validity exist as it can be seen that the square root of AVE for each construct is greater than all the constructs' correlations. Furthermore, the squared correlations of all the constructs shown above the diagonal values are less than all AVEs of the constructs. The values in the Table 4 provide empirical and statistical evidence that constructs used in this study differs from other constructs. Thus, it was concluded that evidence of discriminant validity exists.

Table 4: Assessment of Discriminant Validity

Constructs	1	2	3	4	5	6	7	AVE	CR
Performance Expectancy	.787	.391	.243	.200	.312	.398	.326	.619	.890
Effort Expectancy	.625	.749	.310	.318	.256	.531	.486	.561	.864
Social Influence	.493	.557	.756	.201	.211	.333	.263	.571	.888
Reliability of Internet Banking	.447	.564	.448	.759	.291	.295	.334	.576	.871
Internet Banking Security	.559	.506	.459	.539	.772	.228	.223	.596	.922
Behavioural Intention	.631	.729	.577	.543	.478	.804	.623	.646	.943



Acceptance of Internet Banking	.571	.697	.513	.578	.472	.789	.834	.695	.932
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Result and Discussion

Structural Model Evaluation

The structural model shown in Figure 4 depicts the relationship among PE, EE, SI, RIBS, IBS and BI. Overall the validation of the structural model indicates a satisfactorily fitness indices as shown in Table 2. Table 4 provides the path coefficients while Figure 4 provides the validated structural model of the research framework.

The highest positive significant path relationship was between behavioural intention and internet banking acceptance ($\beta=0.815$, $CR=13.415$, $p < .001$) which was followed by effort expectancy and behavioural intention ($\beta=0.550$, $CR=.084$, $p < .001$) while the least positive significant path relationship was between security and acceptance of internet banking ($\beta=0.094$, $CR=.037$, $p < .05$). Similarly, internet banking security reported negative but non-significant relationship with behavioural intention with path estimates of ($\beta=-0.029$, $CR=-0.039$, $p > .05$).

Table 5: Result of Hypotheses Testing

Hypothesis	Paths	Unstd. Est.	Std. Est.	S.E.	C.R.	P
1	Performance Expectancy → Behavioural Intention	.180*	.189	.054	3.329	***
2	Effort Expectancy → Behavioural Intention	.579*	.550	.084	6.878	***
3	Social Influence → Behavioural Intention	.118**	.121	.049	2.437	.015
4	Reliability → Behavioural Intention	.122**	.123	.052	2.350	.019
5	Service Reliability → Security	.666*	.580	.068	9.776	***



6	Security Intention	→ Behavioural Intention	-.025	-	.039	-.658	.510
7	Security Intention	→ Acceptance	.090**	.094	.037	2.452	.014
8	Behavioural Intention	→ Acceptance	.905*	.815	.067	13.415	***

* = Significant at 1%; ** = Significant at 5%; *** = Significant at 10%

Figure 4: Structural Model

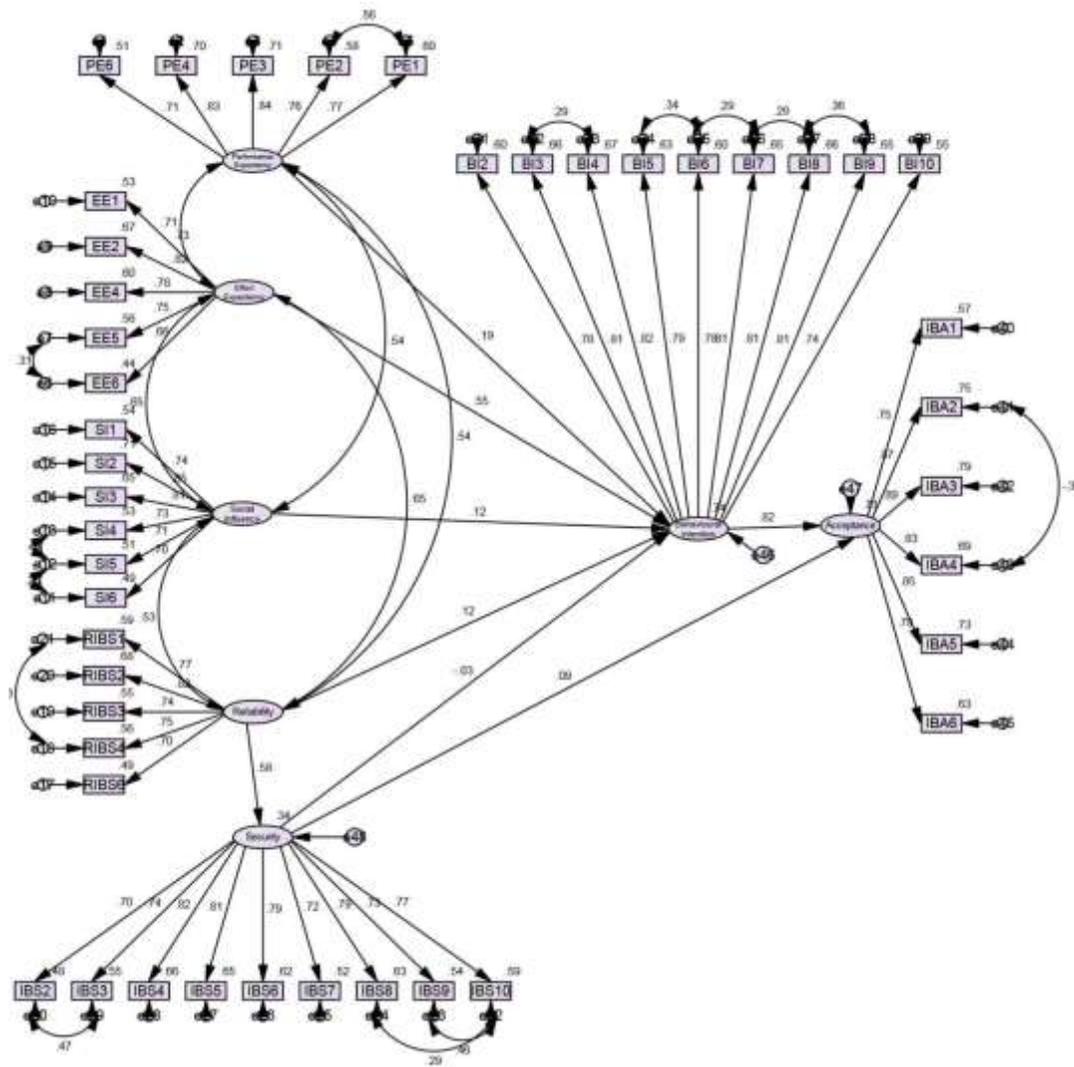




Table 5 revealed that hypotheses 1, 2, 5, and 8 were supported at the 1% level of significance while hypothesis 3, 4 and 7 were supported at 5% level of significance. However, hypothesis 6 was not supported. Specifically, the study revealed that performance expectancy, effort expectancy, social influence and reliability have significant positive effect on behavioural intention to use internet banking and that behavioural intention and security have a positive effect on acceptance of use of technology. The significant positive effect of performance expectancy was consistent with the previous studies by Venkatesh *et al.* (2016), and Chou *et al.* (2018), Alalwan, Dwivedi, Rana, and Algharabat, (2018) who found that performance expectancy with highest path co-efficient weight among other constructs impacts on customers' behavioural intention. However, these findings contradict with the findings of Verkijika (2018) and Sumak, Polanic and Herick (2010), who found that performance expectancy, has no direct effect on consumer behavioural intention.

The study also found a significant positive effect of effort expectancy on behavioural intention to use internet banking which is in agreement with the result obtained by Alalwan, Dwivedi, Rana, and Algharabat (2018); Venkatesh *et al.* (2016); Martins *et al.* (2014), Tarhini *et al.* (2013), and Chou *et al.* (2018) who had found effort expectancy as a strong determinant of consumers' behavioural intention. Similarly, the positive significant effect of social influence on behavioural intention was supported by the work of Venkatesh *et al.* (2003), Venkatesh and Zhhang (2010), Tarhini *et al.* (2014), Yousafzai *et al.* (2010), Kesharwani and Bisht (2012), Stavros and Anastasios (2017). However, unlike the finding of this study, Alalwan, Dwivedi, Rana, and Algharabat (2018), Birch and Irvine (2009) found no relationship between the two variables. The test result of the fourth hypothesis show internet banking reliability to have significant positive effect on behavioural intention. In addition, service reliability influences the perceived security in internet banking. This result is in congruence with the result obtained by Rahi, Ghani, and Ngah (2019) and Sharma, Govindaluri, and Al Balushi, (2015). Finally, internet banking security has no significant effect on behavioural intention to use internet banking. However, there was a significant positive



effect of security concern on internet banking acceptance. This finding is inconsistent with the result obtained by Pikkarainen, Pikkarainen, Karjaluoto and Pahnla (2004) which found a weak relationship between security and behavioural intention to use online banking services. Similarly, Juwaheer, Pudaruth, and Ramdin (2012); Merhi, Hone, and Tarhini (2019), Anouze, and Alamro (2019) found significant positive effect of perceived security on behavioural intention. Also, many banking studies conducted during the past years (e.g. Liao and Cheung, 2002) found an insignificant relationship between security and intention to use internet banking services. One would expect a significant relationship between internet bank security and behavioural intention to use internet banking services, going by several security issues surrounding internet based services, however, the researcher is of the opinion that majority of Nigerian bank customers are majorly concerned about security issues of online transactions and because of the policy mandate for cashless economy in Nigeria and an assurance of security of their information will automatically motivate them to adopt the technology.

Conclusion

The UTAUT theory employed in this work and the research findings, adequately explained the relationship among the variables in this study as follows: Performance expectancy, effort expectancy and social influence have significant causal relationship with customer behavioural intention to use internet banking services among Nigerian banking public. Customers' positive behavioural intention is an indication of their acceptance of internet banking services. Surprisingly, however, much anticipated security issues threatening online banking users and reliability (which is a functional SERVQUAL measure) have weak significant relationship with customers' behavioural intention to use internet banking services. The researchers attribute this to the fact that in social sciences, the complex natures of human behaviour coupled with research environmental factors usually contribute to mixed findings. It can be stated that the results of this study confirm that performance and effort expectancies, social influence,



reliability and security measures are determinants of customers' behavioural intention to accept internet banking services.

The study concludes that though the UTAUT constructs are important determinants of internet banking acceptance among bank customers, there is the need for ensuring service provided are reliable. The reliability of service delivery should be accompanied with strong security systems so that bank customers do not have to fear the risk of loss through invasion by third parties. When such is put in place, it is expected that acceptance rate of internet banking will increase.

Implications of the Study

The results of the study provided empirical evidence that confirms the existence of a causal relationship among the variables of the study. The results of the statistical analysis presented in this study have several practical and theoretical implications. This means that managers, regulatory institutions and other stakeholders in the banking sector can gain insight on the acceptance and use of internet banking systems by customers.

The study show that performance expectancy, effort expectancy, social influence and reliability significantly influence behavioural intention and acceptance of internet banking systems. An understanding of these determinants of internet banking acceptance implies that bank managers can now be able to adjust their marketing strategies to gain more acceptance for the hitherto stagnating internet banking system users. In addition, by understanding the needs and wants of customers regarding the use of internet banking systems, banks will be able to deliver services that meet the needs of the customers thereby improving their performance from increased revenue. The significant positive effect of internet banking service quality variable of reliability on customers' behavioural intention implies that Nigerian banks need to pay attention to the provision of reliable internet banking services with less transaction errors and increased availability. This will go a long way in building stronger relationship, customer loyalty and ensure continual use of the system. Policy makers such as the Central Bank of Nigeria (CBN) and other related regulatory agencies



can also be guided by the result of this study in their decision making and policy formulation towards internet banking.

The proposed model of the study shows that when internet banking users feel that the platform is user friendly and it is safe to transact through the banking platform, they will be more inclined to adopt it than when they feel otherwise. The feeling of safety in conducting transaction through internet banking system depends to a greater extent on the amount effort put in by the banks to minimize the risks associated with the system. When such measures are put in place to mitigate the risk of associated with conducting transactions online and privacy invasions from intruders, customers will be encouraged to make internet banking an integral part of their daily life and the means through which they conduct their transactions and purchases. To achieve this, internet banking systems must be embedded with adequate security features. Secondly, the fast and flawless performance of the technology is another area of concern to bank managers. This is because, a good and secured system that cannot perform what it is designed to perform in an efficient manner (i.e. meet the customers' needs and wants). Finally, the internet banking system must be easy to use so as to create room for more people to try and use it.

Limitations of the Study and Future Research Directions

Although several contributions have been made in this study with regards to the antecedents of customers' behavioural intention, there are also limitations that need to be addressed. First, difficulty in getting a sampling frame is considered as one of the major methodological limitations faced in this research. The inability to get the sampling frame resulted in the use of convenience sampling which is open to more bias than other probability sampling technique. Future research should therefore, employ probability sampling techniques so as to control for bias. Another alternative is, rather than focus on individual customers, future research should consider the determinants of internet banking acceptance among institutional customers. This is because individual and organizational



unit of analysis may be affected by different factors and exploring such dimension will help increase generalization of the findings.

Secondly, this study was based on a cross-sectional strategy where data was collected in one period of time. This does not allow for a more in-depth study of behavioural intention to use internet banking. As such future research can consider using a longitudinal approach in which data collection will cover a long period of time. Furthermore, although this study did not aim to compare the customers from different regions in Nigeria, there could be some differences among the customers from different geographical locations. Due to the differences on ground of geographical location, it is recommended that future researchers on other sectors different from banking sector should conduct a national survey and compare the consumer behavioural responses among different geographical regions in Nigeria. Finally, future studies should also explore other types of bank such as micro-finance banks with the hope of uncovering different findings compared to those of retail banks.

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