

# Customers Intention to Use Internet Banking: Age as a Moderator Variable.

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**Abstract:** The objective of this paper is to identify the moderator role of age in the relationship between Performance expectancy, effort expectancy, social influence, and ability and behavioral intention to use internet banking in Khartoum city. To achieve this objective the researchers adopted the questionnaire to data collection. A total of 137 questionnaires are distributed 100 respondents are well-responded. The results indicate that the age (34yrs and less) does prove as a moderator in effort expectancy and social influence. Whilst the age (more than 34yrs) does prove as a moderator in performance expectancy.

**Keywords:** UTAUT, Khartoum, Internet Banking, Accessibility, quality, Awareness, SmartPLS, Department of Business Administration, College of Sciences and Arts, Al-jouf University, Qurayyat, Saudi Arabia.

## Introduction

Internet banking was first introduced around the early 1980s and started gaining momentum in developing countries in the mid-1990s [1]. Furst et al. (2000) indicate that internet banking has received increased attention among banking practitioners and regulators in recent times. This is mostly attributed to the expected benefits to customers and banking institutions. Stoica et al. (2015) note that internet banking is used as an innovative strategy to improve bank service quality while leveraging the growth of the customer base [2]. The electronic banking in Sudan goes back to 1990s when the central bank of Sudan (CBS) took the initiative to introduce modern information technologies in Sudanese banking industry as a part of its banking system development plan for 1990 – 2000. Consequently, the CBS established the electronic banking services company (EBSC) in 1990 to be responsible for building and developing e-banking industry in Sudan [3]. Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to prevent the use of constructs from various models and

provide a unified perspective of acceptance of technologies [4]. However, despite the fact that internet banking provides many advantages there are still among of customers who does not use such services (), for stance, found that half of the people who tried online banking services will not become active users. Therefore, understanding the reasons for this problems would be useful for bank managers in formulating strategies aimed at increasing internet banking use [5].

The previous studies focused on analyzing causal relationship and providing empirical models, but it is mentioned to crucial contribution of internet banking adoption. Whereas, there are resistance to innovations and those individuals who resist change have received inadequate attention. To fulfil this gap we develop the Unified Theory of Acceptance and Use of Technology by replacing facilitating condition to ability which includes (internet banking awareness, internet connection quality, accessibility, internet banking cost), to study Customers' Acceptance of Internet Banking in Sudan, this research is structured as following. The literature review are proposed

in section two. The conceptual model and research hypotheses is presented in the section three. Section four for methodology. Section five shows the findings and discussion. The final section have the Conclusion and Future Work.

## 1. Literature Review

### 1.1. Internet Banking in Sudan

The internet banking is “a new type of information system that uses emerging techniques such as the internet and the World Wide Web, and has changed how customers perform various financial activities in virtual space” [6]. It has also described in literature as “the delivery of information or services by the banks to their customers using computers or mobile phones via the internet [1]. According to Ramavhona & Makwena (2016) the internet banking allows users to undertake financial transactions without physically visit to the bank.

### 1.2. The UTAUT Model

Venkatesh et al (2003) developed UTAUT model. It is a product study of eight models, which include: theory of reason action (TRA), technology acceptance model (TAM, TAM2), motivational model (MM), theory of planned behavior (TPB), combined TAM/TPB, model of PC utilization (MPCU), and innovation diffusion theory (IDT). UTAUT integrates components from the other models, helps to determine user acceptance on four constructs, namely: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating condition (FC) [7]. Gender, age, experience, and voluntariness of use were introduced as moderators [8]. The first three being direct determinants of usage intention and behavior, and the fourth a direct determinant of use behavior. The variables of gender, age, experience and voluntariness of us all work to moderate the impact of the four key constructs on usage intention and behavior as indicated [3]. See figure 2.2.1 herein below.

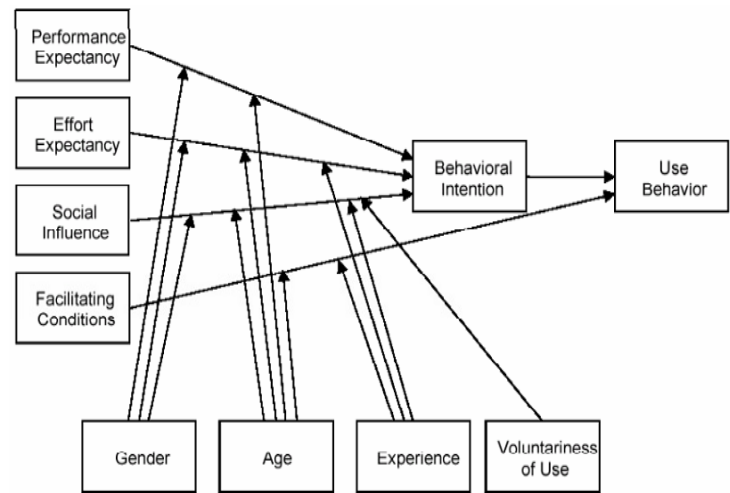


Figure 2.2.1: The UTAUT Model.

Source: Venkatesh et al., 2003, p.447

**Performance Expectancy (PE):** in this research, PE describes as “the degree to which an individual believes that using the internet banking services will help him or her to attain gains in job performance”. According to studies that conducted by Khater, (2016), Khater, Mahmoud, & Almansour, (2016), Mahfuz, Khanam, & Mutharasu, (2016), Afonso et al., (2012) PE has positive influencing on behavior intention. These studies have also shown that this positive influencing of PE on behavior intention is stronger for more than 34 years old Khater, (2016).

**Effort Expectancy (EE):** EE on this research explain that internet banking services users did not find difficult to use internet banking services in their communication media. Prior UTAUT studies’ results presented that influencing is stronger for 34 years old and less Khater, (2016).

**Social Influence (SI):** here the customers perceive that important others (e.g. family, and friends) believe that they should use internet banking services [9].

**Facilitating Condition (FC):** it is reflect the effect of organizational and technical infrastructure to support the use of internet banking, such as user’s knowledge, ability, and resources (Venkatesh et al., 2003) [10]. In this study replaced by ability which included four dimensions (internet banking awareness (IBA), internet banking cost

(IBC), internet connection Quality (ICQ), and accessibility (AC)).

**Internet Banking Awareness (IBA):** Rogers and Shoemaker (1971) defined the awareness as “customers go through a process of knowledge, persuasion, decision and confirmation before they are ready to adopt a product or service” [11]. Khater, (2016) stated that illiteracy among people could be accountable for absence of people’s awareness of new innovations like e-commerce in general, and internet banking in specific.

**Internet Banking Cost (IBC):** According to Suganthi et al. (2001), cost includes initial set up cost of computer and internet connection. Due to the cost of setting up infrastructure to the e-banking service, customers are reluctant to use these services. But, as these are just the startup costs, customers do not mind incurring them [12].

**Internet Connection Quality (ICQ):** The internet connection quality (ICQ) is defined in terms of speed and continuity, can influence user’s perception of the behavioral intention to use IBS. A low-quality connection can make completion of banking tasks difficult and lead to uncertainty regarding the status of transaction. This can adversely impact the degree of behavioral intention to use IBS and affect the adoption of internet banking [13].

**Accessibility (AC):** Convenience accessibility explains the degree to which a particular system is suitable to a person’s needs, activities and plans. In particular, convenient time and proximity is a feature that distinguishes e-banking services from traditional banking services (Suganthi et al., 2001; Ibrahim et al., 2006). As customers can conveniently use the e-banking services anywhere and at any time, access to e-banking services is no longer restricted by geographic constraints (Liao and Wong, 2007) [12].

## 2. Conceptual Model and Research Hypotheses

Basically this research use the UTAUT model to examine The Moderator Role of Age in the Unified Theory of Acceptance and Use of Technology: A study on Customers' Acceptance of Internet Banking in Sudan, this paper proposes a conceptual model bellow.

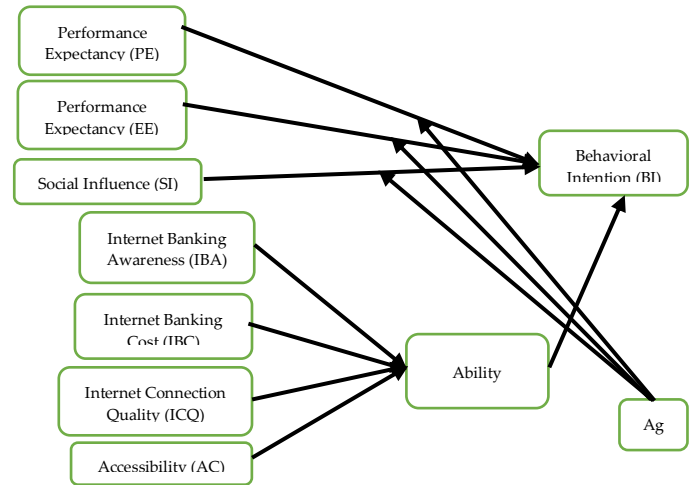


Figure 3.1: Conceptual Model

**H1:** PE has stronger positive effect on behavior intention for people that their ages are 34 years and more.

**H2:** EE has stronger positive effect on behavior intention for people that their ages are 34 years and more.

**H3:** SI has stronger positive effect on behavior intention for people that their ages are 34 years and more.

**H4:** Ability has stronger positive effect on behavior intention for people that their ages are 34 years and less.

## 3. Methodology

This paper objective is to identify The Moderator Role of Age in the Unified Theory of Acceptance and Use of Technology: A study on Customers' Acceptance of Internet Banking in Sudan. The researchers adopted the questionnaire to collect the data. A total of 137 questionnaires are distributed 100 respondents are well-responded. Data collection for this study was restricted to Khartoum State because it is one of the states which have highest proportion of internet banking users. The questionnaire design was divided into two part, the first part is personal information, and the second part consists of

19 questions of 5 variables. The variables used in this research model were adopted from the UTAUT model Vencatch and [13].

[4] [14] Stated that the Partial Least Squares (PLS) is indicated for prediction and complex models, and the choice of it was justified by two aspect: first, compared to covariance structure analysis. Second, PLS does not require any prior distributional assumption and relatively small sample size is acceptable. So that the PLS was used for the measurement models analysis and the structural model analysis.

## 4. Findings and Discussion

### 4.1. Descriptive Analysis

Table 1  
Presents descriptive analysis for the sample

Item	Category	F	%
Gender	Male	75	75
	Female	25	25
Age	Less than 25 years	13	13
	25 – 34 years	50	50
	35 – 44 years	26	26
	45 – 54 years	9	9
	55 years and more	2	2
Education	Basic	3	3
	Secondary	5	5
	Diploma	5	5
	Bachelor	53	53
	High Diploma	5	5
	Master	25	25
	Doctorate	4	4
Marital Status	Married	56	56
	Single	44	44
Occupation	Student	7	7
	Public Sector	24	24
	Private Sector	54	54
	Business	13	13
	Other	2	2
Experience	Less than 5 years	32	32
	5 and less than 10 years	25	25
	10 and less than 15 years	30	30
	15 and less than 20 years	8	8
	20 years and more	5	5
Income	Less than 1,000 SDG	13	13
	1,000 and less than 3,000 SDG	48	48
	3,000 and less than 5,000 SDG	18	18
	5,000 and less than 10,000 SDG	14	14
	10,000 SDG and more	7	7

### 4.2. Assessment of Measurement model

#### 4.2.1. Convergent Validity

Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct [15]. Convergent validity report combine the results of the factor loading, composite reliability (CR), and average variance extracted (AVE) together in one table. [15]. The table 2 shows that all the values were above than 0.60 that indicates the convergent validity.

Table 2: Results of Measurement Model

Construct	Items	Loading	AVE	CR
Performance Expectancy (PE)	PE1	0,740	0,668	0,889
	PE2	0,856		
	PE3	0,866		
	PE4	0,801		
Effort Expectancy (EE)	EE1	0,825	0,648	0,846
	EE2	0,859		
	EE3	0,724		
Social Influence (SI)	SI1	0,793	0,750	0,923
	SI2	0,850		
	SI3	0,924		
	SI4	0,892		
Internet Connection Quality (ICQ)	ICQ2	0,864	0,770	0,910
	ICQ3	0,862		
	ICQ4	0,906		
Accessibility (AC)	AC1	0,803	0,669	0,823
	AC2	0,868		
Internet Banking Cost (IBC)	IBC1	0,862	0,742	0,920
	IBC2	0,988		
	IBC3	0,853		
	IBC4	0,831		
Internet Banking Awareness (IBA)	IBA1	0,900	0,780	0,934
	IBA2	0,873		
	IBA3	0,926		
	IBA4	0,832		
Behavioral Intention (BI)	BI1	0,923	0,863	0,950
	BI2	0,950		
	BI3	0,914		

#### 4.2.2. Discriminate Validity

Discriminate validity is the degree where items are differentiated among constructs and measures distinct concepts [16]. According to Rahi, Ghani, & Alnaser (2017) the average variance shared between each construct and its measure should be greater than the variance shared between the constructs and other constructs. Table three shows that the square root of the AVE as shown in bold

values on the constructs. Table 3 depicts that all the items loaded higher on that construct and loaded lower on the other constructs that confirms the discriminate validity of the constructs.

Table 3: Results of Latent variable Correlations

	AC	BI	EE	IBA	IBC	ICQ	PE	SI
AC	<b>0,836</b>							
BI	0,428	<b>0,929</b>						
EE	0,495	0,484	<b>0,805</b>					
IBA	0,362	0,307	0,421	<b>0,883</b>				
IBC	0,225	-0,049	-0,170	-0,057	<b>0,861</b>			
ICQ	0,589	0,509	0,381	0,263	0,296	<b>0,878</b>		
PE	0,270	0,350	0,448	0,299	-0,070	0,378	<b>0,817</b>	
SI	0,461	0,433	0,291	0,147	0,484	0,649	0,298	<b>0,866</b>

The values in the boldface are square root of AVE

4.3. Assessment of Structural model

The R<sup>2</sup> for behavioral intention in the table 4 and figure 1 was 0,36 which is acceptable based on suggested by Chin (1998). Researchers also assessed the effect size F<sup>2</sup> as suggested by Cohen (1988). Table 5 and figure 1 show that all variables depicted no effect size.

Table 4: Results R-Square of the endogenous latent variable

Construct	R <sup>2</sup>	Result
Behavioral Intention	0,36	Medium

Table 5: Results of F<sup>2</sup> of the exogenous latent variables

Construct	F <sup>2</sup>	Result
PE	0,007	No
EE	0,083	No
SI	0,043	No
Ability	0,038	No

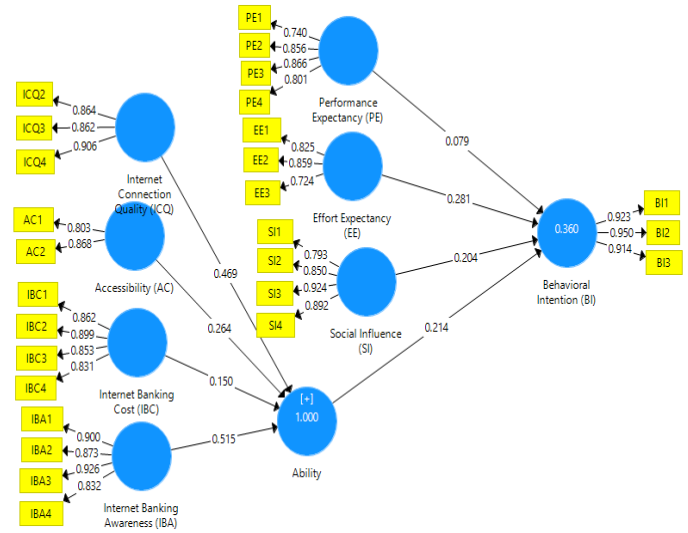


Figure 1: effect size

4.4. Hypotheses Testing

The results of the table 6 below depicts that the relationship between EE and BI, SI and BI are supported ( $\beta = 0.281, p = 0.007$ ), ( $\beta = 0.204, p = 0.040$ ) respectively. But H1 and H4 are not supported ( $\beta = 0.079, p = 0.474$ ), ( $\beta = 0.214, p = 0.111$ ) respectively.

Table 6  
Path Coefficient of the Research Hypotheses

Hypothesis		Std. beta	Std. error	T-value	P-value	Decision
PE → BI	H1	0,079	0,111	0,717	0,474	Not Supported
EE → BI	H2	0,281	0,104	2,716	0,007	Supported
SI → BI	H3	0,204	0,099	2,062	0,040	Supported
Ability → BI	H4	0,214	0,134	1,595	0,111	Not Supported

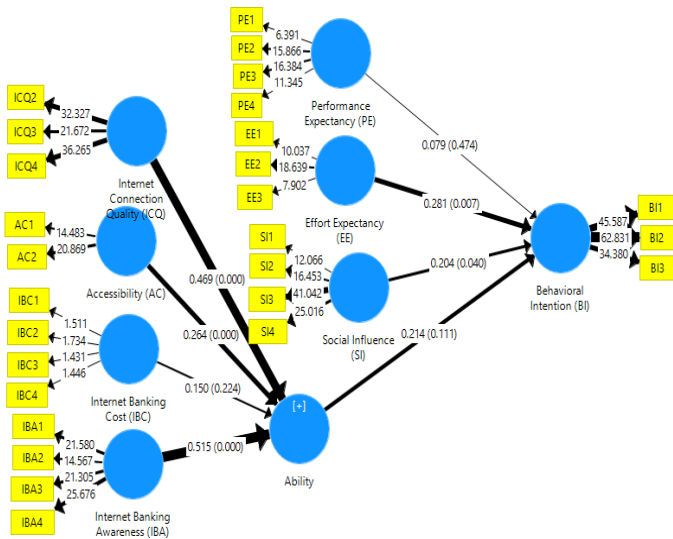


Figure 2: Hypotheses testing

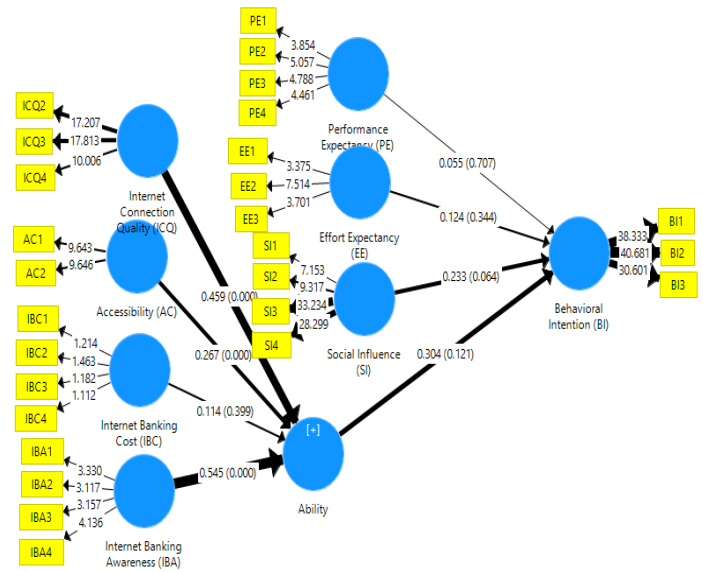


Figure 5.4.1: Path coefficient for 34 years and less

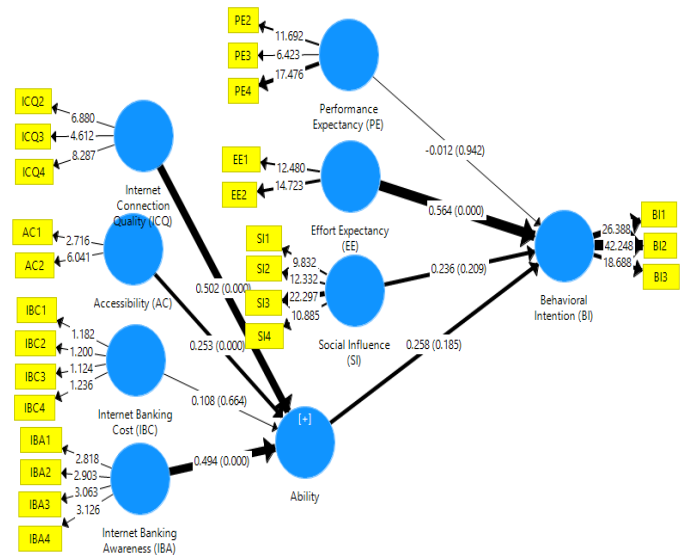


Figure 5.4.2: Path coefficient for more than 34 years

4.5. Age as a moderator variable

According to UTAUT model, testing is conducted to find out whether the age was able to be a moderator on this research. The table 7 below shows that magnitude of the t-value has change compared to the results of testing hypotheses in table 6. It means that the age is prove as a moderator the relationships between Effort Expectancy, Social Influence and Behavioral Intention for people that their ages are 34 years and less, and moderator the relationship between Social Influence and Behavioral Intention for people that their ages are more than 34 years.

Table 7

Path Coefficient of the Research Hypotheses, age as a moderator

Hypothesis	34 years and less				More than 34 years			
	$\beta$	T-value	P-value	result	$\beta$	T-value	P-value	result
PE $\rightarrow$ BI	0,06	0,377	0,707	Not supported	-0,012	0,072	0,942	Not supported
EE $\rightarrow$ BI	0,12	0,948	0,344	Not supported	0,564	3,996	0,000	supported
SI $\rightarrow$ BI	0,23	1,855	0,064	Not supported	0,236	1,359	0,209	Not supported
Ability $\rightarrow$ BI	0,30	1,553	0,121	Not supported	0,358	1,329	0,185	Not supported

5. Conclusion and Future Work

This paper objective is to identify the moderator role of age in the unified theory of acceptance and use of technology: a study on customers' acceptance of internet banking in Sudan. The results of SmartPLS confirmed fitness of the research model in table 2, table 3, table 4, and table 5. Therefore, the modifier model of UTAUT model with internet banking awareness is able to explaining the moderator role of age in the UTAUT model. Results of paper indicate that p-value of age (34 yrs and less) has



changed if compared to the result in table 6. This means that the age (34yrs and less) does prove as a moderator in effort expectancy and social influence. Whilst p-value of age (more than 34 yrs) has changed if compared to the result in table 6. This means that the age (more than 34yrs) does prove as a moderator in performance expectancy. Also the p-value of age generally has not changed, that means the age does not prove as a moderator in internet banking awareness.

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