Incorporating the Innovation Attributes Introduced by Rogers'

Theory into Theory of Reasoned Action: An Examination of

Internet Banking Adoption in Yemen

Ali Hussein Saleh Zolait

Faculty of Business and Accountancy, Department of Business

Sana'a University – Amran University Branch

P.O. Box 41000, Khamer, Republic of Yemen

Tel: 967-01-228795   E-mail: alicomyemen@yahoo.com

Ainin Sulaiman

Faculty of Business & Accountancy, University of Malaya

50603 Kuala Lumpur, Malaysia

Tel: 603-79673800   E-mail: ainins@um.edu.my

Abstract

The causal/effect of seven salient beliefs and an individual's attitude and norms, all of which lead to form a person's Behavioural Intention (BI), are not well documented in the context of Internet Banking (IB). The attitudinal belief, represented by five innovation attributes, together with the normative belief, represented by two types of interaction channels, were extracted in accordance with Rogers' (1995) and Ajzen's (1991) theories and literature. The study proposes a conceptual framework of an individual's behavioural intention determinants to adopt IB and tests it using a path analysis of the Ordinary Least Squares (OLS). The results support the argument that attitude, relative advantage/compatibility, observability, ease of use and mass media interaction are the key determinants of BI to use IB.

Keywords: Internet Banking, Behavioural Intention, Attitude, Norms, Theory of Reasoned Action, Developing Countries

1. Introduction

The consumers' adoption of Internet banking (IB) has received wide attention from researchers in different contexts such as Black et al. (2001), Polatoglu & Ekin (2001), Tan & Teo (2000) among others. Also, incorporating the Theory of Reasoned Action (TRA) and the Diffusion of Innovation (DOI) theory is a new research practice. Therefore, this study examines the determinants of IB in light of both Rogers' (1995) and Ajzen & Fishbein's (1980) theories in an integrated model. Rogers (1995) suggested five important characteristics of an innovation that influences its adoption. These are relative advantage, compatibility, complexity, observability and trialability. Taylor and Todd (1995) utilized these attributes as indicators of attitude in TPB. More to the point, Rogers (1995) suggested two types of interaction channels that accelerate the diffusion of innovation. These are word-of-mouth (WOM) and mass media (MM) interaction. Previous adoption studies that utilized the Theory of Reasoned Action (TRA) used the word-of-mouth referent but not that of mass media (Taylor and Todd, 1995). This study has expanded upon the types of referent describing the normative belief of an innovation, which may be assumed to affect its adoption.

2. Literature Review

Internet banking can be defined as the provision of banking services by a bank to its customers over the Internet (Daniel, 1999). In recent years, IB has been one of the major developments in the financial service sector. Floh and Treiblmaiera (2006) reported that over the last five years IB was the fastest growing Internet activity in the U.S. and in Germany the number of online accounts increased almost tenfold, with 40% of all accounts now being online. IB's literature shows that several scholars have used several theoretical models to study IB adoption. This study has two key objectives; firstly, to investigate the factors that influence the adoption of IB and, secondly, to propose an incorporated theoretical method that can be used as a reference for future studies of innovation diffusion in the field of MIS. This study commenced with a revision of the main theoretical frameworks commonly used for analyzing the adoption of

innovations in MIS. These are Innovation Diffusion Theory (Rogers, 1995; Moore & Benbasat, 1991), Theory of Reasoned Action (Fishbein & Ajzen, 1975), Technology Acceptance Model (Davis, 1989; Venkatesh & Davis, 2000), Theory of Planned Behaviour (Ajzen, 1991), and Decomposed Theory of Planned Behaviour (Taylor & Todd, 1995). A comprehensive review of the IS literature on Internet banking (IB) adoption was conducted and research found an absence of studies exploring the adoption of IB in light of Rogers' diffusion of innovation (DOI). In addition, none of the previous studies attempted to identify the prominent predictors utilizing an integrated framework based on human psychology behaviour and innovation characteristics. This study fills this gap by introducing a conceptual framework merging the TRA into Rogers' DOI.

2.1 The Theory of Reasoned Action (TRA)

Ajzen and Fishbein developed the TRA in 1967 and 1980. It is designed to explain human behaviour (Ajzen and Fishbein, 1980) and consists of two factors that affect behavioural intentions; attitude towards behaviour and subjective norms.

2.1.1 Behavioural Intention (BI)

Behavioural intentions are regarded according to Armitage and Christian (2003) as an individual's decision to follow a course of action, as well as an index of how hard people are willing to try and perform the behaviour (Fishbein & Ajzen, 1975). Theoretically, Ajzen & Fishbein (1980), proposed in the TRA that attitudes and subjective norms (SN) affect BI. Accordingly, the influence of attitude on behaviour is mediated through behavioural intentions. Many researchers like Armitage and Christian (2003) use a BI construct as a dependent variable, assuming that intentions are sufficiently predictive of behaviour and consistently lead to behaviour. For instance, the Technology Acceptance Model (TAM) hypothesizes that the actual use of technology is affected by the BI which is itself affected by the attitude towards use. Similarly, in the TRA, the effects of attitude and SN on behaviour are thus mediated by BI (Ajzen and Fishbein, 1980).

2.1.2 Attitude

Attitude had been assumed to be predictive of behaviour in many psychological studies, for instance Armitage and Christian (2003) who defined it as "the individual's overall positive or negative evaluations of behaviour". It is an important determinant in the information system studies which influence the intention to adopt the system. It was proposed by multiple theories including TRA, TPB and also was utilized by Davis' (1993) TAM to examine user acceptance of computer technology. Furthermore Taylor and Todd (1995) employed attitude to understand the usage of information technology which was found to be an influential element for intention behaviour. Hence, attitude seems to be a person's evaluation or general feeling of favourableness or unfavourableness to use Internet banking services.

2.1.3 Subjective Norms

The influence of social environment on BI is the second normative component in the TRA which according to Ajzen and Fishbein, (1980) concern a persons' perception that most people who are important to him think he should or should not use Internet banking services. Pavlou and Chai (2002) related the issue of social influence to Hofstede's dimension of collectivism in which individuals are integrated into groups and form their judgments based on group norms. The normative influence, according to Bearden et al., (1986) occurs when individuals conform to the expectations of others. Similarly, the informational-based normative influence, according to Rogers (1995, p.199) occurs when potential adopters are aware of an innovation and are motivated to try it. Empirically in this study, normative beliefs are determined by indicating, "The extent to which a referent would expect a potential adopter to adopt internet banking. In fact, the TRA built on that specific salient belief influences behavioural perceptions and subsequent actual behaviour (Ajzen & Fishbein, 1980). There are two types of belief in the TRA that affect two perceptual constructs: behavioural beliefs that influence attitudes, and normative beliefs that affect subjective norm. In turn, these two perceptual constructs determine behavioural intentions and actual behaviour. These salient beliefs are discussed in section 2.2 in the light of Rogers (1995) theory.

2.2 Rogers' Diffusion of Innovation

Rogers (1995) theory, introduces four main elements in the diffusion of innovations. They are; innovation attributes, communicated channels, time and social system. The first elements asserted that the rate of adoption of innovations is impacted by five factors: relative advantage, compatibility, trialability, observability, and complexity (Rogers, 1995). Working in an IS context, Moore and Benbasat (1991) examined the influence of these attributes on attitude. All factors except for complexity are generally positively correlated with the rate of adoption. The second element asserting two communication channels, which according to Rogers' (1995) theory will affect the dissemination of the innovation to others, are the interpersonal influence (word-of-mouth) and the mass media that the individual possesses within the 'innovation decision process'.

2.2.1 Factors of Innovation Attributes

In terms of innovation attributes, an individual's perception about the innovation attributes according to Rogers (995)

review is the first main element in the diffusion of innovation. In line with Rogers (995) concepts, Internet banking should show attractive characteristics to customers which in turn lead to maximize the rate of adoption by them. Rogers (995) recommended some characteristics like; (1) Relative advantage, (2) Compatibility, (3) Complexity, (4) Trialability and (5) Observability. Thus, researchers have to evaluate IB characteristics as seen by those people within the social system of the banking industry to understand the trend of adoption and also the adoption rate. Innovation Attributes were utilized by many authors of IS including Moore and Benbasat (1991), Taylor & Todd (1995a, b), Sarel and Marmorstein (2003) to study innovations diffusion in the IS context. Some authors like Black et al. (2001), Polatoglu & Ekin (2001), Tan & Teo (2000), and Al-Sabbag & Mola (2004) have applied Rogers' variables to IB where different models were discussed. To digress, Rogers' (1995) literature proposed that innovations which are perceived by individuals as having greater relative advantage, compatibility, trialability, observability, and less complexity will have a greater adoption rate than other innovations. To look more closely, this study will elaborate and discuss the issue of these attributes in the following sections.

I. Relative Advantage (RA)

In light of Rogers' (1995) review, the RA of IB is defined here as to what extent an individual perceives IB as being better than the idea it supersedes. Advantages of IB is often expressed as effectiveness, time and effort savings, immediacy of the reward or as decrease of discomfort and social prestige. The construct of relative advantage according to Mattila et al., (2003) can be seen differently in the context of different innovations and different consumers. The value of IB arises and is formed from lowering the transaction costs for both customer (i.e. Lichtenstein and Williamson, 2006; Floh and Treiblmaier, 2006) and banks. It is also derived from the globularity of the medium, i.e. individuals can freely transact and get access to their local bank current account when they are overseas. Lichtenstein and Williamson, (2006) reported that the consumer also considers whether the perceived relative advantages of Internet banking, when compared with other forms of banking, outweigh the perceived risks and costs. In this line, Mattila et al., (2003) reported that the relative advantage gained, compatibility of services with adopters existing values, turned out to be the most significant predictors of adoption in IB. Accordingly, Sarel and Marmorstein (2003) pointed out that when both relative advantage and felt need are low, marketers must make efforts to increase the perceived value of the benefits and issues. Perceived usefulness according to the TAM introduced by Davis' (1989) has a direct affect on attitudes. In some research both relative advantage and compatibility compound together and form constructs grouping all the relevant items.

II. Ease of Use vs. Complexity (EOU)

This attribute has many Synonyms like Usability or Complexity and ease of use. It was frequently cited in literature MIS and found closely linked to an individual's perception on the complexity of practicing the introduced innovation. In this line, Complexity, defined by Rogers' (1995) as "how difficult or easy an innovation appears to an individual. Accordingly, some innovations are easy to understand, communicate and use at first glimpse, others are more complicated and require a long time to diffuse. Davis (1989) in his TAM model demonstrated that the perceived ease of use directly affects attitudes. A low level of complexity or a high level of ease of use lead to higher adoption rates (Rogers, 1995). In other words, complexity increases rejection rates (Rogers, 1995; Sarel and Marmorstein, 2003). Rogers illustrated a negative relationship between complexity and adoption rates. Additional diffusion studies confirm the relationships posited by Rogers. For instance, Tan and Teo's (2000) study demonstrated a negative and insignificant relationship.

III. Compatibility (COM)

Compatibility concerns whether or not IB, as an innovative channel, is compatible with the individual's values and experiences. In this line, innovation is more likely to be adopted when it is compatible with individuals (Rogers, 1995). This argument was supported by the meta-analysis of innovation adoption conducted by Tornatzky and Klein (1982). In previous studies, compatibility appears to have a significant impact on willingness to adopt (i.e. Sarel and Marmorstein, 2003). In this study, respondents were asked about three IB values addressing the assumption of whether IB fits their work; style, mechanism and preferences.

IV. Observability (OBS)

Observability of an innovation like IB according to Rogers (1995) describes the extent to which IB is visible for others to observe and communicate the benefits. However, this definition, in the context of IB, will be considered cautiously because observability of IB might turn to privacy and security issues. Of course, some banking innovations like ATMs which can be seen on the street, or in hyper markets and stores may make this technology more observable than Internet banking which is conducted (indoors) inside one's office or home. In the USA, Kolodinsky and Hogarth (2001) examined the adoption of four electronic banking methods, by which they found observability is only associated with an increased probability of adopting phone banking. In our case observability also describes the degree to which the service can be observed being successfully used (Lichtenstein and Williamson, 2006).

V. Trialability (TR)

Rogers (1995) argues that potential adopters who are allowed to experiment with an innovation will feel more comfortable with it and are more likely to adopt it. Sometimes, trialability according to Kolodinsky and Hogarth (2001) provides customers the ability to evaluate innovation benefits. Consequently, if consumers are given the opportunity to try the innovation certain fears of the unknown and the inability to use can be reduced. In respect to IB, Tan and Teo's (2000) study of Internet users also supported the importance of trialability. Similarly, Chung and Paynter (2002) found that lack of prior use of IB inhibited consumer adoption.

2.2.2 Factors of Rogers' Communication of Diffusion

The second main element in the diffusion of innovation is the communication channel (Rogers, 1995). A communication channel is the means by which individuals learn about Internet Banking. A second area of research involved how norms affect diffusion. In previous studies, mass media channels were more effective in creating knowledge of innovations, whereas word-of-mouth channels were more effective in forming and changing attitudes toward a new idea, and thereby influencing the decision to adopt or reject a new idea. Most individuals evaluate an innovation, not on the basis of scientific research by experts, but through the subjective evaluations of near-peers who have adopted the innovation. This study will examine the potency of the mass media and the word-of-mouth communication in encouraging the diffusion of an innovation by affecting a persons' subjective norms (Zolait & Ainin, 2008).

I. Word-of-Mouth (WOM)

It was argued that in word-of-mouth learning, not only do people learn from a small number of people but that these people also tend to be closer to them (in some sense) than the average person in the population. This is what is called "learning from neighbours (Banerjee and Fudenberg 2004). In this study learning by word-of-mouth communication stands for the logic that, online banking will not be viewed by most respondents as an exciting innovation. Therefore; word-of-mouth learning and communicating IB is assumed to increase the adoption rate of IB. In a previous study on marketing online banking services conducted by Sarel and Marmorstein, (2003) they highlighted that poor word-of-mouth communication contributed to the weak adoption rate. This area presents one of the most critical obstacles to adoption. This study looks into the word-of-mouth by addressing the influence of peer, family, friend and bank's staff on an individual's overall Subjective Norm. Furthermore, Rogers (2003) highlighted that interpersonal communications (word-of-mouth) provide a more effective means of persuading individuals of the benefits of a new innovation.

II. Mass Media (MM)

Mass Media is referred to here as a means of public communication which reaches a large audience. Kreps and Thornton (1992) pointed that media extends people's ability to communicate, to speak to others far away, to hear messages, and to see images that would be unavailable without media. Rogers (2003) reported that, "mass media channels are usually the most rapid and efficient means of informing potential adopters about the existence of an innovation - that is, to create awareness-knowledge". In other words, mass media's most powerful effect on diffusion is that it spreads knowledge of innovations to a large audience rapidly (Rogers, 1995 p.285). Khalifa & Cheng (2002) and Zolait & Ainin (2008) argued that the media, as a source of social influence, can play an important role in the individual's intention formation and it also contributes to exposure.

3. Methodology

In terms of Conceptual Framework, adoption can be conceptualized as behavioural responses of individuals to two motivated forces of attitudinal and normative beliefs. As such, the TRA by Ajzen (1991) suggests that BI can be predicted from the individual attitude and subjective norms. In turn, attitude can be predicted from Rogers' (1995) five attributes of innovation as found in the literature of Taylor (1995). These are relative advantage (RA), Ease of Use (EOU), Observability (OBS), Compatibility (Com), and Trialability (TR). In addition, SN can be predicted using the type of communication channel by which individuals interact with the introduced innovation, identified by Rogers (1995) as word-of-mouth and mass media. The particular theoretical perspective adopted here is from TRA and DOI (Ajzen, 1991; Rogers, 1995; Taylor, 1995 and Moore & Benbasat, 1991). The conceptual framework is shown in figure 1 below;

Study Design, In order to operationalize and test the proposed conceptual framework a multi-phase research design was adopted. First, literature was reviewed and the data relevant to potentially significant variables was collected. Second, an exploratory factor analysis (FA) was performed on the underlying factor structure of variables. Then the content of factors and items loading was analysed to ensure content, construct, and criterion validity and reliability of factors extracted. Third, the proposed framework was operationalized into a testable model and hypotheses pertaining to the relationships in model variables were developed and tested using regression. Finally, procedures of path analysis approached the Ordinary Least Square (OLS) were performed to assess the overall fit of the model.
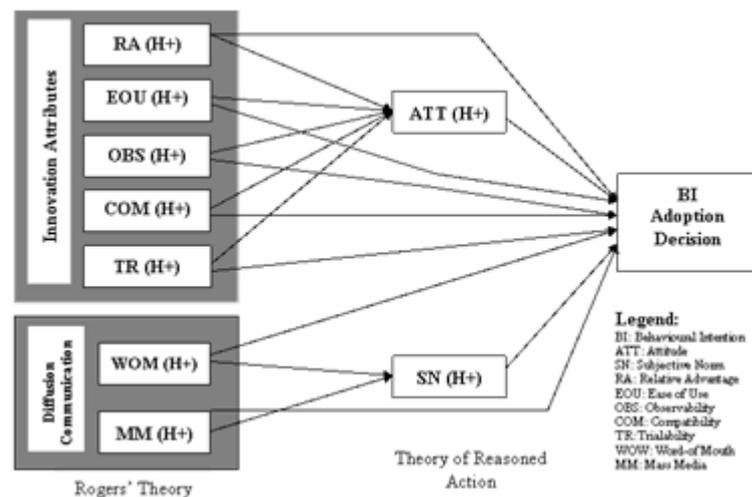
Figure 1. Conceptual Framework of Behavioural Intention Determinants

Instrument, this study utilized previous studies of adoption in developing the appropriate instrument for the data collection. The aim was to ensure the face validity of the scales intended to measure these variables. The final, refined instrument consists of two groups of variables. The first group addressed Rogers' variables with seven variables intended to measure an individual's attitudinal belief and normative beliefs formed by an individual's perception on IB attributes and interaction via both the WOM and MM diffusion channel. The second group deals with the TRA main variables intended to measure, intention, attitude, and subjective norms. Both measures used a 7-point Likert scale. Face and construct validity were established during the adaptation and factorability procedures. To mitigate the responses bias pre-tested questionnaires were not included in the final instrument.

Research Hypotheses, the behavioural intention (BI) to use IB is determined by two theoretical constructs following Ajzen's (1991) TRA which are individuals' attitude and subjective norm. This is in the direct relationship of causal and effect. In addition, the indirect causal and effect relationships link both IB characteristics as behavioural belief and the two types of normative belief of communication channel to the BI construct. Therefore, it is expected that attitude is influenced positively by IB characteristics as well as the subjective Norm by referents' channel. The relationships aforementioned in the conceptual framework are summarized in the following hypotheses:

H_1: Individual's intention to use Internet banking increases as

A)   Individual's attitude on IB increases;

B)   Individual's subjective norm on IB increases;

C)   Individual's perception on relative advantage/compatibility of IB increases;

D)   Individual's perception on the ease of use of IB increases;

E)   Individual's perception on IB trialability increases;

F)   Individual's perception on IB observability increases;

G)   Individual's interaction about IB through mass media increases;

H)   Individual's interaction about IB through word-of-mouth increases;

H_2: Individual's attitude towards using Internet banking increases as

I)   Individual's perception on relative advantage/compatibility of IB increases;

J)   Individual's perception on the ease of use of IB increases;

K)   Individual's perception on IB trialability increases;

L)   Individual's perception on IB observability increases;

H_3: Individual's subjective Norm on using Internet banking increases as

M)   Individual's interaction through mass media increases;

N)   Individual's word-of-mouth interaction increases

4. Sample Plan and Sample Profile

Customers of banks in Yemen are the population of this study, although it is not possible to clearly identify the total population in the banking field. Also because of time and convenience, the 369 respondents are selected randomly as

the research sample. The sample in this study targeted customers who are categorized as holders of bank accounts. 1000 questionnaires were issued and self-administrated to 17 bank headquarters in Sana'a city. There were 369 valid questionnaires returned and the response rate was 52 %. The sample profile of the respondents is shown in Table (1)

Table 1. Respondents Demographic Profile

Variable	Value	Freq.	%	Variable	Value	Freq.	%
Gender	Male	302	81.8	Sector	Public sector	91	24.7
	Female	67	18.2		Private sector	216	58.5
Age	Twenties (19-29 Year)	135	36.6		Individual business	62	16.8
	Thirties (30-39 Year)	147	39.8	Education	Preparatory level & <	31	8.4
	Forties (40-49 Year)	74	20.1		Secondary & diploma	86	23.3
	Older (=> 50 Year)	13	3.5		Undergraduate	203	55.0
Marital Status	Single	86	23.3		Postgraduate & Professional	49	13.3
	Married with children	228	61.8	Residence Ownership	Own	154	41.7
	Married without children	55	14.9		Family house	63	17.1
Nationality	Yemeni	350	94.9		Own with mortgage	12	3.3
	Non-Yemeni	19	5.1		Rent	126	34.1
Resident Area	Sana'a Area	290	78.6		Given for services	12	3.3
	Other Areas	79	21.4		Others	2	.5
Personal Income	Less than 30001 Y.R	55	14.9	Business Nature	Manufacturing	28	7.6
	30001-60000 Y.R	111	30.1		Services	83	22.5
	60001-120000 Y.R	140	37.9		Government	26	7.0
	120001-180000 Y.R	27	7.3		Commercial	99	26.8
	Above 180001 Y.R	36	9.8		Banking & Finance	127	34.4
Profession (Job)	Managerial work	132	35.8		Others	6	1.6
	Clarks	65	17.6	Household Income	less than 40001	31	8.4
	Specialists	43	11.7		40001- 80000 Y.R	90	24.4
	Technicians	31	8.4		80001-120000 Y.R	78	21.1
	Agricultures	5	1.4		120001- 160000 Y.R	66	17.9
	Engineers	27	7.3		160001-200000	27	7.3
	Handcraft	5	1.4		200001-240000 Y.R	29	7.9
	Simple professional	12	3.3		Above 240001	48	13.0
	Other	49	13.3	Total		369	100.0
Total		369	100.0				

5. Data Analysis

An explanatory factor analysis with Factor Axis and varimax rotation was performed to ensure the discriminant convergent validity. The Table displayed variables belonging to the same factor grouped together to form the operational factor aforementioned in the framework. Particularly, each factor items were examined cautiously; only items with consistent meaning were retained for measuring the factor while other items deemed not reliable were excluded from further analysis. Because of this overriding concern with the interpretability of the factors, the analysis suggested that some factors must be purified accordingly. The items dropped from their respective factors were: (EOU05), (EOU06) and (OBS07). The study's instrument and the purified factors are displayed in Table 2 and 3.

Group 1

Table 2. Coding, Items, and Reliability Test of Behavioural Belief Constructs

Factor included	/	Items	Coefficient Alpha	Reference
Attitude (ATT)			0.91	(Fishbein & Ajzen,1975; Ajzen & Fishbein, 1980)
	ATT01:	IB services are a good idea.		
	ATT02:	IB is a wise idea.		
	ATT03:	I like the idea of using the IB services.		
	ATT04:	Using the IB services would be a pleasant experience.		
Relative advantage (RA)			0.93	(Moore & Benbasat, 1991; Karahanna et al. (1999)
	RA1:	IB would enable me to accomplish my tasks more quickly		
	RA2:	IB would improve the quality of my work		
	RA3:	IB would enhance my effectiveness on the job		
	RA4:	IB would make my job easier		
	RA5:	IB gives me greater control over my work		
Complexity (EOU)			0.93	(Moore & Benbasat, 1991; Karahanna et al., 1999; Tan & Teo, 2000; Wang et al., 2003)
	EOU 1:	Learning to operate IB would be easy for me		
	EOU 2:	Overall, If I were to use IB, it would be easy to use		
	EOU 3:	It would be easy for me to become skilful at using IB.		
	EOU 4:	I believe that it is easy to get IB to do what I want it to do.		
Compatibility (COMPT)			0.92	Benbasat, 1991; Karahanna et al., 1999; Tan &Teo, 2000)
	COM1:	IB would be compatible with most aspects of my work.		
	COM2:	IB would fit my work style		
	COM3:	IB would fit well with the way I like to work.		
Trialability (TR)			0.88	Moore & Benbasat, 1991; Karahanna et al. 1999; Tan&Teo 2000; Brown, et al. (2004)
	TR01:	I want to be able to use IB on a trial basis.		
	TR02:	I want to be able to properly try out IB.		
	TR03:	I want to be permitted to use IB, on a trial basis long enough to see what it can do.		
Observability (OBS)			0.79	Karahann, et al.,

OBS1:	I will use IB when many use it.		(1999)
OBS2:	I will use IB when I have seen others using IB.		
OBS3:	I will use IB as soon as I get to know about it.		
OBS4:	I will use IB if this service becomes popular.		
OBS5:	I will wait until other customers start to use IB.		
OBS6:	I will use IB when other people have successful experience of using it.		

Group 2

Table 3. Coding, Items, and Reliability Test of Normative Belief Constructs

Factor included	Items	Coefficient Alpha	Reference
Subjective Norm (SN)		0.93	
SN1	Most people who are important to me would think that I should use IB to get bank services		Taylor & Todd (1995b) Shih & Fang (2004)
SN2	The people who influence my decisions would think that I should use IB.		
SN3	Most people who are important to me would think that I should try out the bank's website to get access to the bank IB.		
SN4	The people who influence my decisions would think that I should try out the bank's website to get access to the bank		
SN5	Most people who are important to me would think that using IB is a good idea.		
SN6	Most people who are important to me would think I should use IB.		
Personal Norms (PR)		0.94	
(MCPER1)*	Peers /colleagues think I should use IB and I will do what peer/colleagues suggest I do.		
MCPER2*	Peers/colleagues think I should try out IB and I will do what peer/colleagues suggest I do.		
MCLEDR3*	Opinion leaders think I should use IB and I will do what leaders suggest I do.		
MCLEDR4*	Opinion leaders think I should try out IB and I will do what leaders suggest I do.		
MCEMPLY*	Bank's employees think I should use IB and I will do what bank's people suggest I do.		
MCEMPLY6 *	Bank's employees think I should try out IB and I will do what bank's people suggest I do.		
Media Norms MM		0.86	
MCMEDIA1 *	Media suggests using IB is good idea and I will do what the media suggest.		
MCMEDIA2 *	Media consistently recommend using IB services and I will do what the media suggest.		
MCPRFS3*	For my profession, it is advisable to use Internet Banking services and I will do what it suggests.		
MCMEDIA3	I read /saw news reports that using IB is a good way of managing my		

*	bank account and I will do what this media suggest.		

* Normative Belief measured using Theoretical approach (a belief-based measure)

5.1 Factor Analysis

To test factorability and reliability of research constructs, the purification procedures of Factor Analysis (FA), item to total correlation and Cronbach's Alpha analysis were performed in this study. Two groups of FA were conducted and the results displayed in Tables 4 and 5. Factors with an eigenvalue greater than 1.0 were retained and the cut-off value of factor loading was greater than 0.5. Accordingly, the set of items comprising IB attributes (Behavioural Belief) construct were subjected to Principal Factor Analysis (PFA) and the solution was rotated using Varimax criterion. Table 4 showing the result of PFA, reveals five distinctive factors underlying an individuals' behavioural belief with respect to the use of IB.

Group 1

Table 4. PFA Result: Factors Underlying Behavioural Belief of IB

	Factor				
	1	2	3	4	5
RA01	.653				
RA02	.740				
RA03	.780				
RA04	.761				
RA05	.760				
COM01	.654				
COM02	.770				
COM03	.776				
OBS01		.707			
OBS02		.739			
OBS04		.750			
OBS05		.732			
OBS06		.764			
EOU01			.744		
EOU02			.810		
EOU03			.747		
EOU04			.535		
ATT1				.701	
ATT2				.663	
ATT3				.735	
ATT4				.654	
TRA01					.773
TRA02					.811
TRA03					.710
OBS03					
Eigenvalue	10.749	4.409	1.384	1.156	1.065
Variance explained	42.995	17.635	5.535	4.623	4.258
Cronbach's Alpha	0.94	0.87	0.93	0.91	0.88
(a) Total Variance Extracted by the five factors 75 %; KMO = 0.928; Barlett's Test <.001					
(b) Extraction Method: : Principal Axis Factoring;					
(c) Rotation Method: Varimax with Kaiser Normalization.					

Items RA01, RA02, RA03, RA04, RA05, COM01, COM02 and COM03 loaded on what were named as

"advantageous". It is obvious from the loading that the aforementioned items are highly correlated with this factor. This solution is in agreement with previous studies conducted by authors including Moore & Benbasat, 1991; Taylor & Todd, (1995 a,b); Mattila, (2003) and Tornatzky & Klein (1982). Item OBS03 did not appear in the rotated matrix as it is not related to any construct. Similarly, the set of items comprising Normative Belief construct were subjected to PFA and the solution was rotated using Varimax criterion. Table 5 shows the result of FA, which reveals three distinctive factors underlying an individual's normative belief.

Groups 2

Table 5. PFA Result: Factors Underlying Normative Belief of IB

	Factor		
	1	2	3
SN01	.769		
SN02	.778		
SN03	.787		
SN04	.779		
SN05	.598		
SN06	.717		
MCPER1		.724	
MCPER2		.681	
MCLEDR3		.794	
MCLEDR4		.802	
MCEMPLY5		.718	
MCEMPLY6		.654	
MCMEDIA1			.840
MCMEDIA2			.838
MCPRFS3			.520
MCMEDIA3			.818
Eigenvalue	9.180	1.699	1.301
Variance explained	57.372	10.617	8.133
Cronbach's Alpha	0.93	0.94	0.86
(a) Total Variance Extracted by the three factors 76 %; KMO = 0.923; Barlett's Test <.001			
(b) Extraction Method: Principal Axis Factoring;			
(c) Rotation Method: Varimax with Kaiser Normalization.			

Items SN01, SN02, SN03, SN04, SN05 and SN06 loaded on what Ajzen (1985) named as the "subjective norm". It is obvious from the loading that the aforementioned items are highly correlated with this factor. Items MCPER1, MCPER2, MCLEDR3, MCLEDR4, MCEMPLY5, and MCEMPLY6 discriminate themselves and converged in what was named as "word-of-mouth referents". It is obvious from the loading that items are highly correlated with this factor. Lastly, items MCMEDIA1, MCMEDIA2, MCPRFS3, and MCMEDIA3 were loaded on the study named "mass media referents".

5.2 Path Analysis

A path analytical approach using the Ordinary Least Squares (OLS) technique was utilized to test the proposed model as recommended by Cohen & Cohen (1983) and is shown in Figure (2). Furthermore, to test for mediation, Baron and Kenny (1986) proposed a four step approach in which several regression analyses were conducted and significance of the coefficients was examined at each step. A series of multiple regression and correlation operations (see Appendix A) were performed due to the specification of the operational model shown in figure (1). The regression beta weights being used as the estimate of the path coefficients.

Table 6. Results of Multiple Linear Regression: BI as Dependent Variable

Predictor Variable	Unstandardised Coefficients		Standardised Coefficients	t
	B	Std. Error	Beta	
IV1 - ATT	.763	.056	.571	13.630*
IV2 - SN	.031	.033	.041	.943
IV3 - RAC	.095	.033	.139	2.885**
IV4 - OBS	-.080	.032	-.082	-2.481**
IV5 - EOU	.184	.051	.158	3.616*
IV6 - TR	-.046	.059	-.025	-.773
IV7 - WOM	.000	.004	.002	.053
IV8 - MM	.012	.007	.066	1.742***

R:	.857
R^2:	.735
Adjusted R^2:	.729

Analysis of Variance					
	DF	Sum of Squares	Mean Square	F	Significance of F
Regression	8	17586.615	2198.327	124.577	.000
Residual	360	6352.691	17.646		

*P <.001, **P <.05, ***P < .10

The relationships among the variables in the recursive model depicted in series equations as follows;

X_{RAC} = e_{RAC}

X_{OBS} = e_{OBS}

X_{EOU} = e_{EOU}

X_{TR} = e_{TR}

X_{PR} = e_{PR}

X_{MM} = e_{MM}

X_{ATT} = P ATT RAC XRAC + P ATT OBS XOBS + P ATT EOU XEOU + PATT TR XTR + e_{ATT}

X_{SN} = PSNPR XPR + P SN MM XMM + e_{SN}

X_{BI} = P BI RAC XRAC + PBIRXR + PIAXA + PA2X2 + PI3X3 + PN5X5 + PINXN + PI6X6 + PI7X7 + PI8X8 +
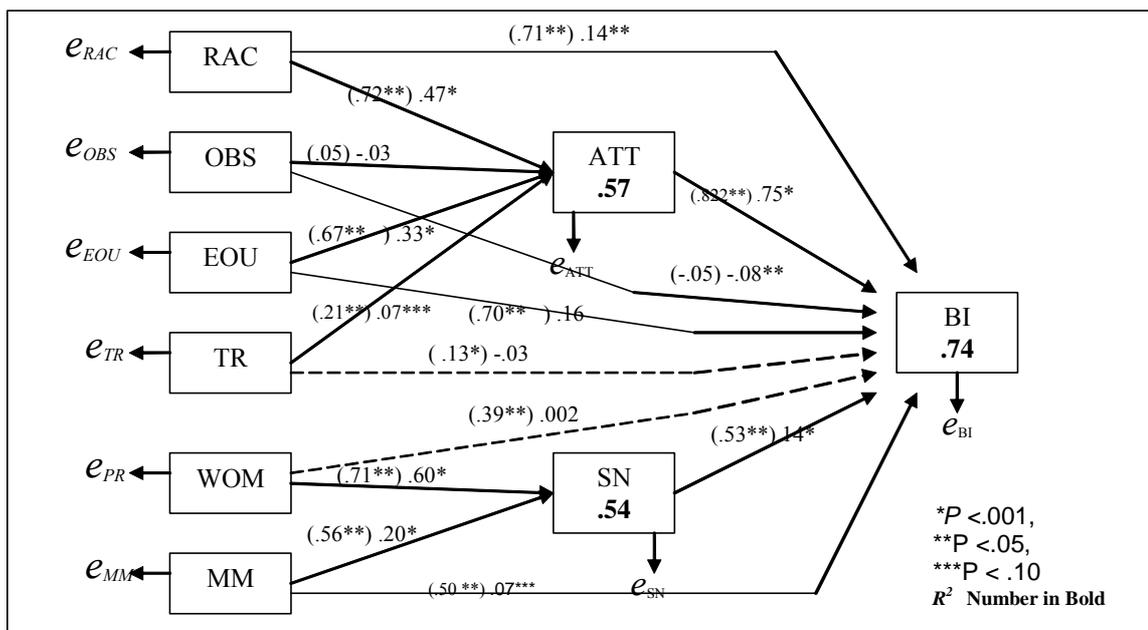
PI9X9 + PICXC + PCI10X10 + e_I

Figure 2. Full Effect Model of Causal Path Findings via OLS

Numbers in Parenthesis indicate zero-order correlation and other numbers are path coefficients.

6. Findings & Discussion

The path coefficient reveals that different factors also exert indirect influences on behavioural intention through either attitude or subjective norm. First, Rogers' (1995) attributes in Internet banking is viewed as a salient behavioural belief that RAC, EOU, OBS and TR directly influences a customer's attitude, and indirectly with exception of TR affects a customer's behavioural intentions to use IB services. Secondly, Rogers' (1995) diffusion channel in IB viewed as a salient normative belief that WOM and MM directly influences a customer's subjective norm. Also the mass media channel exerted a positive effect on an individual's intention at $P < .10$ while the word-of-mouth showed an insignificant effect on BI. Thirdly, an individual's Subjective Norm of IB is related strongly to the individual's mass media based-interaction compared to the individual's word-of-mouth interaction.

Can IB attributes from Rogers' theory of innovation be linked empirically to an individual's intention to adopt IB? This study of 369 bank customers provides a positive answer to this research question, when the intention is considered as a dependent variable and the behavioural and normative beliefs derived from Rogers' adoption variables as independent variables for attitude and subjective norms as in the Theory of Reasoned Action. Therefore; the results also support the proposed conceptual framework that intention can be explained clearly by behavioural and normative beliefs variables. All the paths proposed by the integrated model were supported with the exception of insignificant links of both TR and WOM to the BI. Also, all the hypotheses were supported except for the hypotheses linking TR and WOM to the BI. Therefore; Determinants of Individuals' Intention to Use IB, seem to be the research variables of attitude and subjective which have a direct influence on intention to use IB. This key finding supports the argument. In contrary to Tan and Teo's (2000) study, the relationship between perceived EOU of using Internet banking services and both attitude and intentions to adopt such services was supported. Tan and Teo's (2000) claimed that the insignificant result is due more to the sample's characteristics of Singapore Internet users rather than the inappropriateness of the measure. The Determinant of Individuals' Attitude to use IB, Result that was not expected is the moderate and inverse relationship between the individual's attitude and IB observability as well as IB trialability. This finding points to the existence of a more complex relationship. Findings show that, enabling the observability attribute for innovations like IB is not desirable if the intention is to increase the adoption rate. One explanation could be due to the sensitive nature of banking and specifically IB. The second explanation is that when potential adopters are given the chance to observe IB functions, they become inverse thinking on whether IB is secure or not. They may also be concerned with privacy issues. Determinants of Individuals' SN to use IB, Research has shown that the concrete person's Subjective Norm is developed through communication exchanges about the innovation with through word-of-mouth (i.e. peers, staff and opinion leaders more than through Mass Media. In line with Sarel and Marmorstein's (2003) study, banks need to examine current communication tactics and identify more effective ways to communicate benefits of IB. New approaches to address these problems need to be considered.

7. Generalizability

The data set of the sample split into two samples, the hold-out subsample (192 cases) and the analysis subsample (177

cases). The purpose of validation analysis is to test the generalizability of the regression analysis Model to the population represented by the sample in the analysis.

Table 7. Split Sample Validation Analysis: Validating Regression Results (Determinants and Models)

Variable Entered	Full Model Sample (n=369)			Sample 1 Split = 1(n=192)			Sample 2 Split = 0 (n=177)		
DV – Intention	Beta	t	p.	Beta	t	p	Beta	t	p
F		252.10	.000		61.956	.000		127.14	.000
(Constant)		1.304	.193		.578	564		1.401	.163
IV1 - ATT	.571	13.630	.000	.531	8.842	.000	.632	10.362	.000
IV2 - SN	.041	.943	.347	.066	1.021	.309	.002	.031	.975
IV3 - RAC	.139	2.885	.004	.167	2.425	.016	.102	1.476	.142
IV4 - OBS	-.082	-2.481	.014	-.087	-1.896	.060	-.075	-1.531	.128
IV5 - EOU	.158	3.616	.000	.126	1.918	.057	.189	3.164	.002
IV6 - TR	-.025	-.773	.440	-.004	-.085	.933	-.052	-1.134	.258
IV7 - PR	.002	.053	.958	-.011	-.168	.867	.015	.256	.799
IV8 - MM	.066	1.742	.082	.096	1.774	.078	.035	.640	.523
Summary Table									
Multiple R	.86			.86			.86		
R²	.74			.73			.75		
Adjusted R²	.73			.72			.73		
SE	4.20			4.31			4.14		

8. Conclusion

As a topic for further research this study concurs with Ajzen (1991) who encourages the exploration of additional variables and regards the theory of planned behaviour as "open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the theory's current variables have been taken into account" (p. 199).

The primary benefit of this study is as a contribution to knowledge in the area of diffusion of innovation in developing countries. It emerged there is a need to incorporate the attributes of innovation together with the channel by which these attributes are communicated to the social network.

"We make a living by what we get, but we make a life by what we give"

Sir Winston Churchill

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Appendices

Appendix A

Multiple Regressions

DV1 – Attitude (ATT)	SE	Beta	t	F	p	Hypotheses Testing
Independent Variables						
				118,286	0.000	
Constant	1.037		5.363		0.001	
IV1–Relative Advantage/Compatibility (RAC)	.027	.466	8.764		0.000	Supported
IV2-Oservability (OBS)	.030	-.026	-.627		0.531	Rejected
IV3-Ease of Use (EOU)	.045	.325	6.230		0.000	Supported
IV4–Trialability (TR)	.056	.068	1.653		0.099	Rejected
Model Summary						
	R	R^2	Adj. R^2	Durbin-Watson		
	.752(a)	.565	.560	2.010		
DV2 – Subjective Norms (SN)	SE	Beta	T	F	P	
Independent Variables						
				210.169	0.000	
Constant	.786		13.774		0.000	
IV1 - Personal Referent (PR)	.006	.596	13.334		0.000	Supported
IV2 - Media Referent (MM)	.011	.196	4.396		0.000	Supported
Model Summary						
	R	R^2	Adj. R^2	Durbin-Watson		
	0.731	0.535	0.532	1.794		
DV3 – Behavioural Intention (BI)Independent Variable	SE	Beta	T	F	P	
				406.029	0.000	
Constant	.900		.319		0.750	
IV1 – Attitude (ATT)	.046	.749	21.808		0.000	Supported
IV2 – Subjective Norms (SN)	.026	.138	4.011		0.000	Supported
Model Summary						

	R	R^2	Adj. R^2	Durbin-Watson	
	.830	.689	.688	2.136	

*P > .05 ** p >.1*

Correlation

Variables	BI	ATT	SN	PR	MM	RACO MPT	OBSERV ABLITY	EASEOF USE	TRIALA BLITY
BI	1		.534 (**)	.394(**)	.499(**)	.707(**)	-.045	.700(**)	.130(*)
ATT	.822(**)	1	.530 (**)	.384(**)	.482(**)	.716(**)	.050	.672(**)	.211(**)
SN	.534(**)	.530(**)	1	.714(**)	.555(**)	.562(**)	.057	.532(**)	.199(**)
PR	.394(**)	.384(**)	.714 (**)	1	.603(**)	.481(**)	.218(**)	.383(**)	.261(**)
MM	.499(**)	.482(**)	.555 (**)	.603(**)	1	.581(**)	.169(**)	.460(**)	.231(**)
RACOMPT	.707(**)	.716(**)	.562 (**)	.481(**)	.581(**)	1	.140(**)	.726(**)	.265(**)
OBSERVABL ITY	-.045	.050	.057	.218(**)	.169(**)	.140(**)	1	-.076	.512(**)
EASEOFUSE	.700(**)	.672(**)	.532 (**)	.383(**)	.460(**)	.726(**)	-.076	1	.099
TRIALABLIT Y	.130(*)	.211(**)	.199 (**)	.261(**)	.231(**)	.265(**)	.512(**)	.099	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).