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Drivers and Inhibitors of Internet Banking Adoption in India

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Abstract

Banks are providing e-banking services, as this would ameliorate their profits. Since internet banking in India is still in its nascent stage, it is essential for e-banking institutions to enhance acceptance and usage of internet as a banking channel by their customers. This paper has reviewed the most of seminal studies in the area of diffusion of innovation and makes an attempt to do an empirical research that looked into the factors that drives and inhibits internet banking usage in India. An exploratory factor

analysis followed by a confirmatory factor analysis has been applied on 362 internet banking users. Findings resulted in seven factors – perceived benefit, hacking and fraud risk, performance risk, computer self-efficacy, technology complexity, social influence, and pricing concerns. The results suggest that acceptance and usage of internet banking services can turn into a vital concern for future research, as the drivers overcoming the inhibitors over time at an influencing rate. Moreover, this study also compares the findings with existent diffusion of innovation literature and identified several additional factors that can affect internet banking adoption in India.

Keywords: Technology Adoption, Perceived Risk, Drivers, Inhibitors.

INTRODUCTION

In the last two decades, there has been a paradigm shift in banking industry by the technology-based approach in business. Banks across the world are motivated to integrate information technology (IT) into their daily operations to gain top-line as well as bottom line benefits (Jayawardhene and Foley, 2000). But these benefits can be reaped only through the increased market share. However, India is one of the fastest adopter of internet in world over the last decade and there has been a huge investment to develop internet banking system in India (Kannabiran & Narayan, 2009; Gupta, 2008; Kumar and Mittal, 2004). Very few brick-and-mortar bank customers are willing to use internet banking service in India (Gupta, 2008; Kumar and Mittal, 2004). This poses a question among the practitioners as well as the researchers that "why the consumers are not willing to avail internet banking services in India?" This requires the attention of both, the researchers and the practitioners, to identify the various reasons that can inhibits internet banking usage in India.

Though, recent development shows that most of brick and mortar banks are evolving themselves by shifting their focus towards up gradation of their own new e-banking capabilities. Internet banking services are progressively turning as "need to have" rather than "nice to have". In a study by Internet and Mobile Association of India (IAMAI) in 2006, it has been found that the people are hesitant/reluctant to do banking/financial transactions through banks' internet websites because of reasons such as security concerns (43%), preference for face-to-face transactions (39%), lack of knowledge about online transactions (22%), lack of user friendliness environment (10%), and lack of this facility in current bank (2%). In this survey nearly 83% out of total bank users was male and about 43% of internet banking customers in the survey was in the 26-35 years age group. Moreover, even after around three year the usage of internet banking is in subtle condition.

In a study conducted in 2009 on internet users conducted by IAMAI, it was found that only about 12% of the online users prefer Internet banking as the banking channel in 2009 as compared to 20% of the same in 2008. These figures indicate that still a significant number of online users do not use or avoid the use of internet as a banking medium in India. There has been very limited research done in this field to explore the factors that promotes and also factors that inhibits the acceptance and use of internet banking in India. So, it calls for an indigence to understand the reasons for not using it.

This study has been divided into four sections: First section highlights the growth and pattern of internet banking usage in India; second section reviews literature based on factors influencing the innovation technology adoption have been discussed; third section describes the research methodology of the study; fourth section presents the data analysis and findings of the study; and fifth and final section discuss about the findings and its managerial implication.

Internet Banking in India

Internet banking in India emerged in mid nineties as newly introduced private sector banks came up with a new business model revolving around a strong information technology (IT) backbone. Internet bank in India was initiated by ICICI bank, a private bank, in 1998. Following this, a large number of government banks as well as private banks opted for offering internet banking service. The number of bank customers who uses internet banking as one of the medium to perform banking activities has also been continued to grow (Malhotra and Singh, 2007). This growth and success over the last decade has posed a strong competitive pressure on remaining Indian banks (government/public sector/private sector) to respond immediately to remain competitive (Kannabiran & Narayan, 2009). This competitive pressure has led the way for banks to go for IT as a strategic tool to examine the recent development in the banking industry and understanding its impact on banking relationships. Now banking in India is not only confined to brick and mortar banks where customers have to visit the branch in person to withdraw or deposit cash/cheque, make a request for account statements, and many more. Today, through internet banking, most of the banking services (like account enquiry, cash withdrawal, third party transfer, bill payments, book tickets, mobile recharge, etc.) can be accessed online anytime and anywhere customer want.

Nonetheless, the success (or failure) of new technology depends on the extent to which it is adopted (or rejected) by consumers at large (Sahay and Mohan, 2003). In his study Gupta (2008) has found that most of Indian banks are confronting two major challenges in integrating IT into their business activities both as an operational necessity and as a strategic tool. Thus, in addition to the factors that facilitate internet banking usage, it is more important to identify factors that are roadblocks to internet banking usage in India.

LITERATURE REVIEW

Drivers of Innovation Adoption

Adoption of internet banking in India can be studied from the perspective of information technology adoption (Polasik and Wisniewski, 2009; McKechnie et al, 2006; Guriting and Ndubisi, 2006; Fusilier and Durlabhji, 2005; Perez et al, 2004). Initially internet banking was used mainly for the purpose of information sharing and presentation medium. After sometime banks were started using it as a source of marketing their financial product online. With the growth of faster and safer electronic fund transfer services more banks had also implemented internet banking as their transactional and informational medium (Ravi *et al.*, 2006). There is plethora of research that stress on examining the relationship among the factors affecting computer technology adoption and their utilization among users. Most of them have shown that internet accessibility, awareness, attitudes towards change, proper guidance to operate internet banking services, security concerns, trust on bank, and problem solving attitude of bank employees are the major factors that can drives the adoption of internet banking services in India. There are some seminal studies which have exclusively focused on identifying and measuring the determinants of any new technology use. Some of them are theory of diffusion of innovation (Roger, 1962);

theory of reasoned action (Fishbein & Ajzen, 1975), theory of personal behavior (Triandis, 1977), theory of planned behavior (Ajzen, 1985), technology acceptance model (Davis, 1986; Davis, 1989) and its extensions (Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Davis, 1996).

Roger's (1962) diffusion of innovation theory suggests that adoption of a new technology depends upon five technology characteristics including relative advantage, compatibility, complexity, observability, and trialability. Tornatzky and Klein (1982) have conducted a meta-analysis of studies on innovation adoption literatures and concluded that compatibility, complexity and relative advantage are the innovation characteristics that consistently appeared as key variables in the diffusion of innovation literature.

Theory of reasoned action (TRA) has been proposed by Martin Fishbein and Icek Ajzen (1975). This theory separates attitude towards behavior from behavioral intention by recognizing that there are some situation factors that limit the influence of attitude over behavioral intention. TRA posits that individual action is explicitly concerned with his/her attitude towards the behavior and subjective norms. Attitude towards the behavior is formed by strength of his/her belief about any particular behavior and individual evaluation about outcome. Subjective norms depend on normative beliefs i.e. "what I think others expect from me to do"; and motivation to comply i.e. "how important is it for me to do what I think others expect me to do". Finally these two effect behavioral intention of an individual, which ultimately guides to action or behavior.

Triandis's (1977) theory of personal behavior hypothesizes that utilization of a new technology by an individual in, an voluntarily environment, is influenced by his/her beliefs towards the new technology, social influences, past experience or habits, his/her expected outcome of using the new technology, and facilitating conditions to use the new technology in a conducive environment. Using this theory Thompson *et al.* (1991) have examined the relationship among the different determinants of personal computer usage behavior and found that social factors, technological complexity, job fit and long-term consequences have a significant impact on usage behavior.

Technology acceptance model (TAM), based on TRA, postulates that when there is a new technology came into existence then a number of issues come into their consideration about how and when users of that technology may accept/use that. TAM posits that "perceived usefulness" and "perceived ease of use" mediate the relationship between system characteristics and behavioral intention of an actual user (Gerrard *et al.*, 2006; Fusilier and Durlabhji, 2005; Wang *et al.*, 2003). Perceived usefulness can be defined as the prospective adopter's subjective probability about new technology to be beneficial to his/her personal or economic well being. These benefits may include increase in efficiency, improvement of quality, cost saving, etc. (Davis, 1989). Davis (1989) has studied individual adoption of a new computer system and found that perceived usefulness has a direct and positive impact on individual attitude towards adopting a new technology. Perceived ease of use can be defined as the degree to which a prospective adopter expects new technology to be free from effort (Philip *et al.*, 1994; Davis, 1989). The measurement of these constructs require basic knowledge of new technology, if the individual is aware of the technology applied as well as the facilitating conditions such as demo, training or user manual that a company is providing to user. It has been found that perceived ease of use positively affects perceived utility of the new technology and also attitude towards technology adoption (Perez et al, 2004).Theory of planned behavior (TPB) is one of the predictive persuasion theories that link between the attitude towards the behavior and behavioral intention of an individual. In a narrow sense TPB is an extension of TRA. In addition to attitudes towards behavior

and subjective norms, TPB also talks about concept of 'self-efficacy'. Self-efficacy is a conviction that one can successfully execute the behavior that is required to produce desired output. This is supposed to be most important precondition for behavioral change (Bandura, 1977, 1982).

Literature review also suggests that factors affecting acceptance of a new technology may vary with change in technology itself. Moreover, most of previous works in this context have been done on a relatively simple technology such as on personal computers, e-mail, word processing and spreadsheet software; and World Wide Web. Motivated by insights from these previous research works about the influential existence of some common mediating variables, this paper make an attempt to identify some inhibitors of internet banking usage to facilitate a more comprehensive explanation of acceptance of internet banking in India.

Inhibitors of Innovation Adoption

Perceived risk plays a critical role in affecting individual decision to accept or reject a new technology (Ndubisi & Sinti, 2006; Rotchanakitumnuai & Speece; 2003). Perceived risk is the customers' subjective expectation about financial and/or information loss due to computers and internet/electronic media (Manzano et. al, 2009). Though it is very difficult to address risk objectively, in the context of internet banking services it is relatively easier to address key potential risk issues that may have an adverse impact on behavioral intention of an individual to adopt (reject) internet banking services (Wang *et al.*, 2003). Literature shows that there could be five dimensions of perceived risk associated with internet banking services. The first dimension is security risk, related to consumers' fear about their safety of their financial transaction over internet. Some researchers as Sathye (1999) in study of internet banking adoption in Australia, Gerrard and Cunninghham (2003) in the study of adopters and non-adopters in Singapore, Cheng et al (2006) in a study of customers' acceptance of internet banking in Hong Kong have found the security of financial transaction as a key determinant of internet banking adoption. Second dimension is privacy risk, this reflects the customers worry about leakage of their personal details and/or account details to any third parties (Furnell and Karweni, 1999). So, customers' perceived risk about leakage of their personal and account details would have a negative impact on behavioral intention of customers (Pikkarainen et al, 2004; Mukherjee and Nath, 2003). Third dimension is performance risk. It is concerned with the customer's perception that how well system has capability to perform their financial transaction through internet effectively and efficiently (Gerrard and Cunninghham, 2003). Fourth dimension is time loss risk i.e. loss of time spent by the customers in dealing with erroneous search and transactions process, time spent in filling required information, time spent in waiting for response of website confirmation, internet server and download speed etc. (Littler and Melanthiou, 2006; Jayawardhena and Foley, 2000). The last dimension is related to the social risk i.e. risk related to the lack of human interaction and also risk related to the possibility of drawing in some unfavorable attention and response from society or family having negative attitude internet banking technology (Littler and Melanthiou, 2006; Suganthi et al, 2001). So, perceived risk arises from any or all of above mentioned dimension may adversely affect customers' perception regarding use of internet banking services.

Also, several researchers have found that customers are not enthusiastic to accept and use internet banking services because they think that new technology is very complex to understand and difficult to operate, so technology complexity have a significant effect on the perceived ease of use of the customers (Lu et al. 2003). There are several information and communication technology (ICT) based services such as ATMs and phone banking which are perceived as less technical and easy to use by the customers,

but some services like net banking are still not accepted by the customers widely due to considered as highly technological complex services (Gerrard *et al.* 2006). In studies related to internet banking and mobile banking it has been found that higher level of technological complexity corresponds to the lower level of customer's perceived ease of use, and hence lowering the individual behavioral intention to use the e-banking services (Ndubisi & Sinti, 2006; Gerrard, Cunningham & Devlin, 2006).

Apart from all these factors researchers such as Gerrard, Cunningham & Devlin (2006) have hypothesized that pricing concerns could also be one of the reasons why customers are avoiding internet banking services. They argued that in order to become an internet user one must have following two things: access to a personal computer/laptop and internet connection/subscription. And both things require some cost to customers. Moreover, while doing bill payments, online shopping or booking tickets, etc. banks are also charging some percentage of transactions amount as service tax.

Motivated by the these insights from previous research, this paper makes an attempt to identify some key drivers and inhibitors in order to make a more comprehensive explanation of acceptance of internet banking in India. Here, we address two important research questions: What are the factors that may attract the Indian traditional bank users to do financial transaction through internet banking? and Why Indian traditional bank users are not accessing their financial transaction through internet?

RESEARCH METHODOLOGY

Measurement Instrument

A personally (researcher) administered questionnaire was used to collect the required information as this method allows the respondent to clarify any doubt on the spot and also ensure the completion of the questionnaires fully within a control environment. The questionnaires were distributed to respondents over period of 10 days, and were requested to return the complete filled questionnaire within a week. It had been taken care that respondents fill the questionnaire voluntarily. The questionnaire had two sections: first section described the nature of study and ask respondent to read statements carefully and give a score to each belief statement ranging from 1 (strongly disagree) to 7 (strongly agree); and second section asked the respondents to give their demographic details. All the items in questionnaire were closed ended questions having several options. Items in questionnaire were adopted from reliable and validated scales of previous studies. Items for perceived ease of use and perceived usefulness were adopted from Venkatesh and Davis (1996); items for computer self-efficacy were adopted from Venkatesh (2000); items for social influences and technology complexity were adopted from Venkatesh and Davis (2000); and items for privacy risk, security risk and performance risk were adopted from Zhao *et al.* (2008).

Pre-test: Refinement of the Instrument

Since there are very few studies on internet banking usage have done in Indian context, a pretest study has been done to further enhance the reliability and validity of the items of the previous items in Indian context. In pretest, 53-items questionnaires were administered to 280 business management students in a premier institute in India. They were given the instructions to fill the questionnaire in a scale of 1 (strongly disagree) to 7 (strongly agree). Data collection was done at individual level with no collaboration among participants. Following the criterion suggested by Hair *et al.* (2010), items that loaded below 0.5 and factors having Eigen value smaller than 1 were lowest were discarded from further analysis. This results in a final instrument having 40 items. All items for each construct are presented in table 1.

Table 1: Measurement Instrument

Construct	Scale	Item
Financial Risk (Zhao *et al.* 2008)	The internet banking system is insecure for conducting bank transaction	FR1
	Internet banking services are not safe to conduct banking transactions	FR2
	Internet banking websites may be misused or hacked	FR3
	Internet banking services are not credible because it lack personal/human touch	FR4
	There is possibility that fake internet banking websites may appear on the screen	FR5
Technology complexity (Venkatesh and Davis, 2000)	The information on bank website is not clear and understandable	TC1
	Internet banking services have some technical problems	TC2
	I will have to be careful in using internet banking services to avoid mistakes	TC3
Social Influence (Venkatesh and Davis, 2000)	People close to me suggest that I should avoid using internet banking	SI1
	I prefer visiting the bank branch and transacting with the bank officials to internet banking	SI2
	Family members suggest me not to rely on internet technology for banking transaction purpose	SI3
Computer self-efficacy (Venkatesh 2000)	Internet banking services will be easy to use if someone shows me how to use it first	CSE1
	Internet banking services will be easy to use if I see someone else using it before trying it myself	CSE2
	I may make mistakes in tapping out the correct username and passwords while using internet banking	CSE3
Perceived Usefulness (Venkatesh and Davis, 1996)	Internet banking services will improve my efficiency in conducting bank transactions	PU1
	I think internet banking allow me to manage my banking activities more efficiently	PU2
	Using internet banking would improve my performance in conducting banking transactions	PU3
Privacy Risk (Zhao *et al.* 2008)	There is a possibility that others will misuse my personal details, if I use internet banking services	PRIV1
	My username and passwords information will not be safe from unauthorized third parties, while using internet banking	PRIV2
	There is a possibility of leakage of my personal information, when I use internet banking	PRIV3
Performanc e Risk (Zhao *et al.* 2008)	It is possible that connection may be lost while using internet banking	PR1
	Internet banking services is not capable enough to perform banking transactions	PR2
	Internet banking service does not provide any better service as compared to traditional banking service	PR3
	Use of internet banking will decrease my ability to control over my financial matters.	PR4
	Internet banking services does not perform as I expect	PR5
Perceived ease of use	It is very easy to do transaction through internet banking	PEOU1
	Working with internet technology does not require a lot of mental	PEOU2

(Venkatesh and Davis, 1996)	effort	
	It is easy to learn how to use internet banking	PEOU3
	Internet banking service is not easy to use	PEOU4
	Internet banking are not user friendly	PEOU5
Pricing concerns (Zhao *et al.* 2008)	Using internet banking is expensive (internet charge, etc.)	PC1
	There is possibility that for using internet banking I would be charged.	PC2

Data Collection, Sample Design and Characteristics

Once the measurement instrument has been purified, revised questionnaire was used to collect the data from actual banking customers. It was condition that respondents are currently using internet and are also banking users. Data was collected from four hundred and ten (410) banking users from different locations (Banks, government offices, private offices, etc.) of Hyderabad city. Apart from these locations data were also collected from a premier B-school in Hyderabad, because a survey conducted by jointly Indian Marketing Research Bureau (IMRB) and Internet and Mobile Association of India (IAMAI) show that students are also using internet (i-cube 2011 report) in India. Among the collected questionnaire 48 responses were deemed unusable. Thus final sample include three hundred and sixty-two (362) usable internet banking users responses. Table 2 presents a brief summary of demographic information of respondents.

Majority of the respondents were male (68.3%) which is again consistent with IAMAI report 2005-06 and also consistent with this type of previous studies (Prakash and Malik 2008; Polatoglu and Ekin 2001). Majority of the respondents (85.1%) were in 19-45 age groups, which is representing the Indian internet usage statistics of 85% (IAMAI, 2011). The sample constitutes of graduates (52.5%) and post-graduates (20%) which are consistent with similar previous empirical studies (as Prakash and Malik 2008, etc.). In sample, 71% of respondents are doing service (government/private), which is comparable with Prakash and Malik (2008) study in Indian context.

Table 2: Demographic Profiles of Respondents

Profile	Description	No. of Respondents
Gender	Male	247 (68.2%)
	Female	115 (31.8%)
Age (in completed years)	18 years – 25 years	96 (26.5%)
	26 years – 35 years	152 (42.0%)
	36 years – 35 years	60 (16.6%)
	46 years – 55 years	43 (11.9%)
	56 years and above	11 (3.0%)
Educational background	Intermediate	22 (6.1%)
	Graduation	190 (52.5%)
	Post-graduation	72 (19.9%)
	Ph. D. (including pursuing)	32 (8.8%)
	Others	46 (12.7%)
Annual family income	Below 2 Lakhs	63 (17.4%)
	Between 2 Lakhs to 4 Lakhs	175 (48.3%)
	Between 4 Lakhs to 6 Lakhs	79 (21.8%)
	Above 6 Lakhs	45 (12.4%)
Occupation	Government	78 (21.5%)

	Private	179 (49.5%)
	Business	47 (13.0%)
	Student	58 (16.0%)

Data Analysis

Data analysis has been performed in two steps: First step utilized the exploratory factor analysis in which factor structure has been identified; then in second step confirmatory factor analysis has been applied to assess the psychometric properties of the identified construct.

Exploratory factor analysis (EFA), An EFA was applied to the 40 items to identify the factors affecting internet banking usage in Indian context. An examination of the data and sample size indicates that the sample is appropriate for EFA (Hair *et al.* 2008). The Kaiser-Meyer-Olkin (KMO) is 0.894, which is more than the recommended value of 0.6 for sample adequacy. Bartlett's test of sphericity is also significant at 0.1% (Bartlett, 1954). As suggested by Hair et al. (2010), only those factors with Eigen value greater than 1 and factor loading greater than 0.50 were retained for further analysis. This step resulted in 31 items forming seven factors. These seven factors were explaining 73.64 percent of the variance after varimax rotation. Following table 3 shows the factor structure identified by EFA. Identified factors were: perceived benefits, hacking and fraud, performance risk, computer self-efficacy, technology complexity, social influence, pricing concerns.

Table 3: Exploratory factor analysis result

Items	Perceived Benefits	Hacking and Fraud	Performance Risk	Computer Self-Efficacy	Technology Complexity	Social Influence	Pricing Concerns
PU1	0.807						
PU1	0.788						
PU3	0.784						
PEOU1	0.779						
PEOU2	0.769						
PEOU3	0.737						
PEOU4	0.737						
PEOU5	0.726						
FR1		0.804					
FR2		0.780					
FR3		0.776					
PRIV1		0.767					
PRIV2		0.721					
FR4		0.651					
FR5		0.631					
PRIV3		0.580					
PR1			0.743				
PR2			0.735				
PR3			0.711				
PR4			0.685				
CSE1				0.772			
CSE2				0.825			
CSE3				0.693			
TC1					0.785		
TC2					0.755		
TC3					0.683		
SI1						0.776	
SI2						0.774	
SI3						0.679	
PC1							0.616
PC2							0.603

Confirmatory factor analysis (CFA), To assess the measurement reliability and construct validity of identified factors a CFA has been done using AMOS 20.0. Measurement model reflects adequate fit with chi-square (CMIN) value of 732.7 and 413 degree of freedoms resulting in chi-square to degree of freedom ratio (CMIN/df) of 1.774, which is less than the recommended value of 3 (Anderson and Gerbing, 1988; Hair et al. 2010). Seven other generally used model-fit indexes were also estimated to judge the model's overall goodness of fit. Table 4 is presenting all eight estimated model fit indexes of first-order measurement model.

Table 4: Model fit indexes for measurement models

Model fit Index	Recommended Value*	Measurement Model
Chi-square to degree of freedom ratio (CMIN/df)	3.000 or below	1.774
Goodness of fit index (GFI)	0.900 or above	0.966
Adjusted goodness of fit index (AGFI)	0.900 or above	0.910
Normed fit index (NFI)	0.900 or above	0.982
Incremental fit index (IFI)	0.900 or above	0.970
Comparative fit index (CFI)	0.900 or above	0.982
Root mean square residual (RMSR)	0.100 or below	0.068
Root mean square of error approximate (RMSEA)	0.070 or below	0.034
*Recommended values as suggested by Anderson and Gerbing (1988) and Hair et al. (2010)		

For measurement of survey scale reliability, we have estimated Cronbach alpha value. Hair et al. (2010) and Nunnally (1978) have emphasized that the reliability coefficient above 0.70 demonstrates adequate reliability. As shown in table 5, construct perceived benefits (α = 0.920), hacking and fraud (α = 0.897), performance risk (α = 0.821), computer self-efficacy (α = 0.769), and social influence (α = 0.785) have reliability coefficient greater than 0.70. This means that these constructs holds good reliability. However, two constructs namely technology complexity (α = 0.694) and pricing concerns (α = 0.665) scores reliability coefficient value less than 0.70. As their values are comparable to 0.70 and they were retained for further analysis.

Table 5: Reliability and Validity Measures

Construct	Item	λ	SMC	CR	α	AVE
Perceived Benefit (PB)	**PU1**	0.907	0.823	0.960	0.962	0.750
	PU1	0.888	0.789			
	PU3	0.884	0.781			
	PEOU1	0.879	0.773			
	PEOU2	0.869	0.755			
	PEOU3	0.837	0.701			
	PEOU4	0.837	0.701			
	PEOU5	0.826	0.682			
Hacking and Fraud (H&F)	**FR1**	0.904	0.817	0.956	0.955	0.730
	FR2	0.884	0.781			
	FR3	0.876	0.767			
	PRIV1	0.867	0.752			
	PRIV2	0.851	0.724			
	FR4	0.821	0.674			
	FR5	0.816	0.666			
	PRIV3	0.813	0.661			
Performance Risk (PR)	**PR1**	0.896	0.803	0.922	0.922	0.746
	PR2	0.883	0.780			
	PR3	0.854	0.729			

	PR4	0.821	0.674			
Computer Self-Efficacy (CSE)	**CSE1**	0.872	0.760	0.918	0.918	0.789
	CSE2	0.925	0.856			
	CSE3	0.866	0.750			
Technology Complexity (TC)	**TC1**	0.885	0.783	0.896	0.902	0.742
	TC2	0.855	0.731			
	TC3	0.843	0.711			
Social Influence (SI)	**SI1**	0.876	0.767	0.909	0.907	0.768
	SI2	0.874	0.764			
	SI3	0.879	0.773			
Pricing Concerns (PC)	**PC1**	0.816	0.666	0.792	0.796	0.655
	PC2	0.803	0.645			
Note: *S.D. = Standard Deviation, λ = Standardized Factor Loading, SMC = Squared Multiple Correlation, CR = Composite Reliability, α = Cronbach Alpha, AVE= Average Variance Explained*						

Hair et al. (2010) have suggested that convergent validity can be assessed by three ways: (i) each factor loading should be greater than 0.50; (ii) value of average variance explained (AVE) should be greater than 0.50; and (iii) value of composite reliability should be greater than 0.70.

Table 5 shows that the minimum factor loading value is 0.803, which is greater than acceptable cut-off of 0.50. As shown in table 5, all factors have AVE value greater than 0.50. Moreover, composite reliability value is also more than 0.70 cut-off value. Technology complexity has been considered to be reflecting convergent validity as its AVE value is more than cutoff 0.50 and its composite reliability value at 0.697 is almost equal to cutoff 0.70. Hence, except pricing concerns, all factors are showing adequate convergent validity.

Measurement reliability

Fornell and Larcker (1981) have emphasized on both the reliability of each measurement item (indicator) and the reliability of each construct. The measurement reliability of measurement model was assessed through Cronbach alpha (α) and squared multiple correlations (SMC). Cronbach alpha is a measure to estimate construct reliability, while SMC is a measure to estimate indicator reliability. As mentioned in Table 5 above, Cronbach alpha values are greater than cut-off values of 0.70 (Hair et al. 2010), and all SMC values are greater than 0.30 (Baggozi and Yi, 1988).

Convergent validity

Convergent validity is defined as the degrees to which items of measurement instrument correlate with items in the measurement instrument that are intended to measure the same construct. Hair et al. (2010) suggested three criterions to ensure convergent validity: standardized factor loading of each individual indicator should be greater than 0.50, the average variance explained value for each construct should be greater than 0.50, and composite reliability (CR) value for each construct should be greater than 0.70. As shown in table 5 above, identified factor structure (i.e. measurement model) satisfies all three requirements. Therefore, this measurement model shows adequate convergent validity.

Discriminant validity

It is a measure to test that the constructs intended to measure different theoretical concepts do not highly correlate with each other. There are two ways to ensure discriminant validity: Pair-wise construct comparison method (Bagozzi and Philips, 1982;

Anderson and Gerbing, 1988; Bagozzi and Yi, 1988) and comparison of shared variance between factors with the square root of average variance explained by individual factors (Fornell and Larcker, 1981). In pair wise comparison method, we compare all 21 possible pairs for the 7 factors separately. For each pair, the chi-square value of the full model was compared with the chi-square value of the collapsed model (one pair of constructs was collapsed). More precisely, in the collapsed model, the model is same as the full model except that one pair of target factors were constrained to have a correlation of 1 (Figure 1). Anderson and Gerbing (1988) have suggested that if the collapsed model is significant and its chi-square value is more than the values of the full model by four or more, then the free model reflects a better fit than the collapsed one. This indicates that collapsed factors are not measuring the same concept and hence increasing chi-square value i.e. collapsed factors are discriminant from each other.

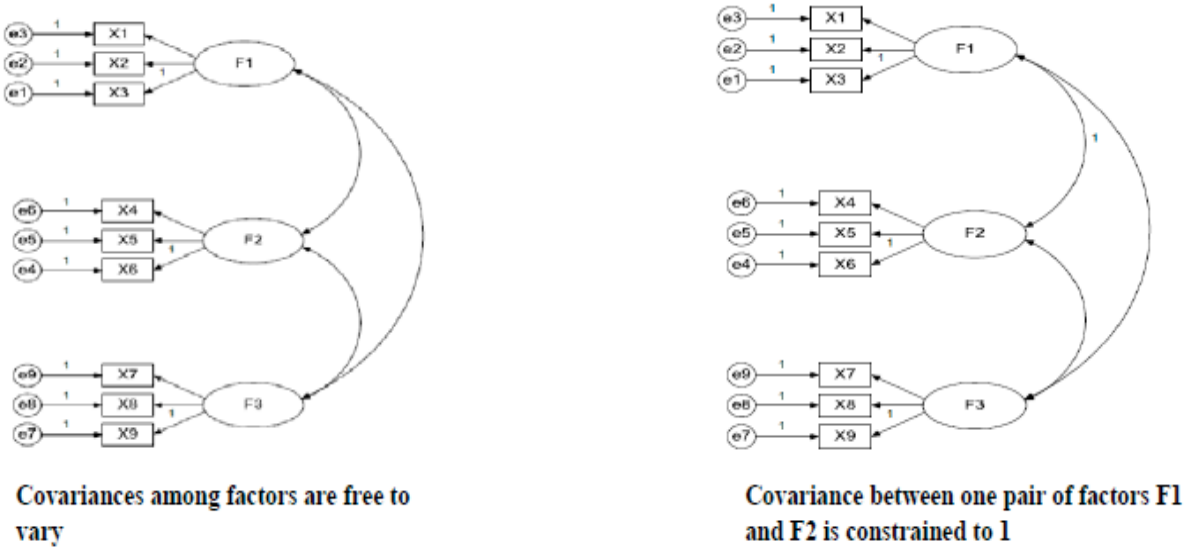

Figure 1: Full model vs. collapsed model comparison for assessing discriminant validity

As shown in table 6 for each possible combination of 21 collapsed models chi-square value has increased by more than four and hence all factors are discriminant from each other.

Table 6: Pair-wise Construct Comparison for Discriminant Validity

Model	χ^2 Value (df)	Model	χ^2 Value (df)
Original full model	732.7 (413)	H&F and PC	771.2 (414)
PB and H&F	788.9 (414)	PR and CSE	753.5 (414)
PB and PR	763.7 (414)	PR and TC	760.4 (414)
PB and CSE	779.3 (414)	PR and SI	749.7 (414)
PB and TC	769.1 (414)	PR and PC	748.6 (414)
PB and SI	775.3 (414)	CSE and TC	761.7 (414)
PB and PC	754.4 (414)	CSE and SI	760.8 (414)
H&F and PR	765.7 (414)	CSE and PC	761.8 (414)
H&F and CSE	763.2 (414)	TC and SI	763.9 (414)
H&F and TC	770.4 (414)	TC and PC	750.9 (414)
H&F and SI	766.4 (414)	SI and PC	773.5 (414)
Note: PB= Perceived benefit, H&F = Hacking and fraud, PR = Performance risk, CSE= Computer self-efficacy, TC= Technology complexity, SI= Social Influence, PC = Pricing concerns			

Besides, to ensure discriminant validity, Fornell and Larcker (1981) have recommended the comparison of correlations among constructs with the square-root value of average

variance explained. They suggested that to achieve discriminant validity the diagonal value should be greater than the non-diagonal values. As Table 7 clearly shows, all eight factors are different from each other.

Table 7: Comparison of inter-construct correlation for discriminant validity

Construct	PB	H&F	PR	CSE	TC	SI	PC
PB	**0.866**						
H&F	0.286	**0.855**					
PR	0.351	0.631	**0.864**				
CSE	0.489	0.524	0.497	**0.888**			
TC	0.520	0.398	0.355	0.636	**0.861**		
SI	0.282	0.279	0.325	0.455	0.364	**0.876**	
PC	0.176	0.273	0.278	0.127	0.190	0.259	**0.810**
Note: PB= Perceived benefit, H&F = Hacking and fraud, PR = Performance risk, CSE= Computer self-efficacy, TC= Technology complexity, SI= Social Influence, PC = Pricing concerns							

Findings

Once the psychometric properties of the constructs have been assessed, the factor structure was discussed next. First factor is 'perceived benefit' of using internet banking usage containing the motivating factors such as perceived ease of use and perceived usefulness. This is consistent with most of the previous findings in diffusion of innovation literature (Venkatesh 2000; Venkatesh and Davis, 2000; Davis, 1986). This means that customers have found internet banking services easier to put into practice and also found it helpful in reducing time and effort that an individual need to invest in banking transactions. Perceived usefulness, in this context, could be services such as online request for cheque/demand draft, sending monthly e-statements, online payments, etc. Previous research has shown that users often form favorable attitude and behavioral intention to adopt technology if they have positive perception of ease of use and perceived usefulness (Gerrard *et al.* 2006; Guriting and Ndubisi 2006; Fusilier and Durlabhji 2005; Wang *et al.* 2003; Wang *et al.* 2003; Karjaluoto *et al.* 2002; Philip *et al.* 1994).

The second factor is hacking and fraud risk. This factor combines the two dimensions of risk: privacy risk and security risk, associated with internet banking usage. Findings show that customers' perceived risk about leakage of their personal information and account details would have an impact on internet banking usage. Security risk is concerned with the consumers' fear about safety of their financial transaction through internet. The central theme of internet banking relies on to keep transactions safe from serious security vulnerability. Online security is threatened by more than hacking and phishing attempts. Some researchers such as Pikkarainen *et al.* (2004) and Mukherjee and Nath (2003) have also extended the TAM by integrating perceived risk concept.

Third factor, performance risk**,** represents the consumers' perception regarding the capability of IT as well as availability of resources to perform banking services effectively and better than traditional banking services. This risk is concerned with the customer's skeptical perception that wheatear technology is capable enough to perform their financial transaction through internet successfully and efficiently. This type of risk is mostly manifested in the banking users who have less belief in information technology as a whole. Usually they have lesser computer knowledge as well as less exposure to internet based services.

Fourth factor, computer self-efficacy, reflects the individual perception about his/her knowledge and capability to perform internet banking services accurately without making

error. As Bandura (1997) mentioned that self efficacy is a perception, different customers having the same skills, may have different self-efficacy. Gist and Mitchell (1992) have pointed out that self-efficacy has three aspects: First, self-efficacy is an individual's judgment about his/her capability to perform a particular job. Second, the individual's opinion on self-efficacy adjusts as the individual acquires direct experiences. Third, a decision of self-efficacy also demands an intrinsic motivation that guides the individual's behavior. Oliver and Shapiro (1993) suggest that stronger the individual self-efficacy beliefs, the greater the possibility that he or she will attain the desired goal. Ajzen (2002) has extended theory of reasoned action (Ajzen, 1991) by including self-efficacy beliefs under 'perceived behavioral control' variable to deal with situations in which people may lack complete capability to exercise control over their behavior. For exploring e-banking usage, this addition is significant as it relates the causal link between internet self-efficacy and behavioral intention to use e-banking services (Howcraft, Hamilton and Hewer, 2007; Hirunyawipada and Paswan, 2006). Thus, understanding the usage pattern and role of computer self-efficacy in e-banking usage constitutes an important research issue.

Fifth factor, technological complexity, represents an individual perception that use of internet banking services are very difficult to understand and requires a lot of expertise and concentration to perform a successful transaction. According to Rogers (1962), one of the essential attribute of a successful technology is that it should be less complex than contemporary technology. Findings also show that the most of the bank customers are not accepting and using internet banking services because they find that technology used is very complex to understand and difficult to operate (Ndubisi and Sinti 2006; Lu *et al.* 2003). Sixth factor, social influence, reflects the importance of reference group including family and friends on internet banking acceptance. Lastly factor seven, pricing concerns, represents the individual avoidance of internet banking services because they think that use of internet banking services are costlier than traditional banking services (internet subscription charge, PC, etc.).

DISCUSSION AND CONCLUSION

Though internet banking is an emerging phenomenon, key individual factors driving and inhibiting its acceptance and continuous usage have not been considerably researched. This paper hypothesized that apart from perceived ease of use and perceived usefulness; there could be other factors that can affect internet banking adoption in India. Perceived risk is a function of customers' general perception of security and privacy issues, social influences (image of service in society, effect of news and media), and performance (perception about compatibility with banking transactions). Several studies such as Gerrard *et al.* (2006) and Wang *et al.* (2003) have pointed out that perceived risk can also affect the usage behavior of internet banking customers. This implies that all possibilities of interaction with current as well as potential customers need to be carefully managed so that there would be minimum risk in whole transaction process.

Meanwhile, banks should also aware the customers about its advantages, like customers can avoid crowd or long waiting lines in brick-and-mortar banks and also promote the comfort of doing banking transactions at home.

Current study has several advantages over previous research. Table 8 compared the present research findings with two seminal studies in innovation adoption research namely Roger's diffusion of innovation theory and technology acceptance model. Present study has identified that perceived risk had not been captured in any of these two

studies. Further, it has discovered two factors performance risk had not been addressed in technology acceptance model before.

Table 8: Comparison of Findings with Previous Research

Current Study	Roger's Diffusion of Innovation	Technology Acceptance Model
Perceived benefit	Relative Advantage	Perceived Ease of Use, Perceived Usefulness
Perceived Risk	----Not addressed----	----Not addressed----
Performance Risk	Observability	----Not addressed----
Computer Self-Efficacy	Trialability, Compatibility	Computer Self-Efficacy
Technological Complexity	Complexity	Perceived Ease of Use

As key findings of this study are that perceived risk and performance risk as inhibitor of internet banking use. Therefore, we advocate that banks should exercise huge investment to provide the resources required to enhance the accurate functioning of the banking related jobs to ensure that online banking customers experience greater proficiency in the e-banking services. Also, to control the negative word of mouth, use of happy and satisfied customers' testimonials is also recommended. Here, inhibitor has been modeled as a formative construct, and it is important to assess the relative importance of each inhibitor dimension as opposed to dealing inhibitors altogether. The findings of this study can be concern to both banks as well as to policy makers as it may helpful to them in circularizing their strategic alignment of e-banking strategies, planning and implementation of e-banking initiatives and managing gains along with facilitating development of e-banking services in emerging economies like India.

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