

“Empirical Assessment of a Modified Technology Acceptance Model in Emerging Economy: An Assessment from the Perspective of Indian Consumers”

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Abstract. Information technology Services is considered as the key driver for the changes taking place around the world. The shift from the formal banking to e-banking has been a 'leap' change. This study determines the factors influencing the consumer's adoption of e-banking in India and hence investigates the influence of perceived usefulness, perceived ease of use and perceived risk on use of e-banking. It is an essential part of a bank's strategy formulation process in an emerging economy like India. Survey based questionnaire design with empirical test was carried out. The results have supported the hypothesis that banks need to highlight the benefits of e-banking, make it easy to use, and enhance its security to improve consumers' trust.

Keywords: e-banking, perceived usefulness, ease of use, perceived risk

1. Introduction

Revolutionary development in Information and Communication Technology (ICT) in the past 20 years has impacted individuals as well as businesses in a profound way. It is an invaluable and powerful tool driving development, supporting growth, promoting innovation and enhancing competitiveness [11, 17]. Banks and other businesses alike are turning to Information Technology to improve business efficiency, service quality and attract new customers [13, 17]. E-banking is thus emerging as a radical technological innovation with potential to change the structure and nature of banking by speeding up communication and transactions for clients. Despite the growth in e-banking services, there is not enough evidence of its acceptance amongst consumers. Customer satisfaction and customer retention are increasingly developing into key success factors in e-banking [1]. Though customer acceptance is a key driver determining the rate of change in the financial sector, empirical studies on what is holding customers from acceptance of e-banking services have been few. Not enough is known regarding how customers perceive and evaluate electronically delivered services which have also highlighted the need for further research to measure the influence of e-service on customer perceived service quality and satisfaction.

One of the most utilized model in studying information system acceptance is the technology acceptance model (TAM) in which system use (actual behavior) is determined by perceived usefulness (PU) and perceived ease of use (PEU) relating to the attitude toward use that relates to intention and finally to behavior. For studying the acceptance of e-banking, the original TAM is inadequate because the technology used and the transaction environment in e-banking are different from that of conventional IT and the normal business environment. Before accepting e-banking services, users should be aware about benefits, security issues and the risk associated with it. In this regard, an extended TAM model with the addition of an extra variable (perceived risks) to the model to provide a more comprehensive theoretical perspective of user technology acceptance in the context of e-banking services becomes imperative.

Prior research has empirically found positive relationship between PU and PEU as critical factors on the use of e-banking [19]. It is suggested that perceived risk is more powerful at explaining consumers'

behavior since consumers are more often motivated to avoid mistakes than to maximize utility in purchasing [15]. Previous study suggests that perceived risk is an important ingredient in consumer decision making process regarding the adoption of information technology [5, 14]. The present study aims at examining the impact of PU, PEU and perceived risk (PR) on the acceptance of e-banking by the consumers.

2. E-BANKING IN INDIA

Banks boost technology investment spending strongly to address revenue, cost and competitiveness concerns. The purpose of present study is to analyze such effects of e-banking in India, since only few rigorous attempts have been undertaken to understand this aspect of the banking business. A study on the Internet users, conducted by Internet and Mobile Association of India (IAMAI), found that about 23% of the online users prefer internet banking as the banking channel in India, second to ATM which is preferred by 53%. In the study by IAMAI, it was found that the people are not doing financial transactions on the banks' Internet sites in India because of reasons such as security concerns (43%), preference for face-to-face transactions (39%), lack of knowledge about transferring online (22%), lack of user friendliness (10%), or lack of the facility in the current bank (2%). Hence there is a need to understand the reasons for not favouring e- banking services.

3. RESEARCH MODEL AND HYPOTHESES

PU and PEU is significant factors affecting acceptance of an information system or new technologies and previous research has empirically found positive relationship between PEU and PU as critical factors on the use of e-banking [2, 19].. Hence it was hypothesized:

H1: Perceived usefulness has a positive effect on use of e-banking.

H2: Perceived ease of use has a positive effect on use of e-banking.

Perceptions of risk is a powerful explanatory factor in consumer behavior as individuals appear to be more motivated to avoid mistakes than to maximize purchasing benefits [15]. Services are inherently more risky than products and the major reason for this is the higher levels of uncertainty which are associated with services [15]. PR usually arises from uncertainty. Hence it was hypothesized:

H3: Perceived risks have a negative impact on use of e-banking.

4. METHODOLOGY

Data were collected through an interview schedule administered to 200 bank customers belonging to 19 public sector banks in the city of Coimbatore, India during April- June 2011. Convenience sampling method was used in the selection of the sample respondents. A total of 200 questionnaires were distributed to the bank customers who use e-banking services. Each questionnaire item was scored on a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree). Factor analysis was performed to assess the validity of the construct and regression analysis was employed to analyze the data. Statistical Package for Social Sciences (SPSS) version16 was used has the analysis tool.

5. RESEARCH FINDINGS

Reliability is determined by Cronbach's coefficient alpha (α), a popular method for measuring reliability [16]; Nunnally [18] suggests that for any research at its early stage, a reliability score or alpha that is 0.60 or above is sufficient. As shown in Table 1, the reliability scores of all the constructs were found to exceed the threshold; all measures demonstrated good levels of reliability (greater than 0.80).

Table 1 Reliability Statistics

Determinants	No. of items	Reliability for this sample
PU	5	0.802
PEU	5	0.853
PR	5	0.832

To determine the underlying structure, the correlation matrix was initially examined to determine how appropriate it was for factor analysis. The Kaiser- Meyer-Oklin (KMO) value was .774, which is higher than the recommended minimum of 0.6 [10] indicating that the sample size was adequate for applying factor analysis. In addition, the value of the test statistic for sphericity [3] on the basis of a Chi-squared transformation of the determinant of the correlation matrix was large (1.417E3). Bartlett's test of sphericity was significant, supporting the factorability of the correlation matrix and the associated significance level was extremely small (0.000). For factor extraction, principal component method was used, under the restriction that the eigen value of each generated factor was more than one. A factor analysis was conducted to develop constructs that will help to evaluate factors that will influence customer's usage of e-banking. Three factors were generated, which explained 70.59% of the variability of the data. The extracted factors were then rotated using variance maximizing method (Varimax). These rotated factors with their variable constituents and factor loadings are given in Table 2.

Table 2 Rotated Component Matrix

	Components		
	PEU	PR	PU
Ease of use	.589		
Ease of use	.763		
Ease of use	.654		
Ease of use	.650		
Ease of use	.534		
Risk		.607	
Risk		.734	
Risk		.726	
Risk		.735	
Risk		.645	
Usefulness			.787
Usefulness			.904
Usefulness			.822
Usefulness			.693
Usefulness			.594

The factors identified were PU, PEU and PR. The dependent variable was formed by referring to the customers' usage of e-banking services. The regression analysis was conducted to reveal how different factors affect the use of online banking. Regression results are shown in tables 3 and 4.

Table 3: Model Summary

R	R Square	Adjusted R	F	Sig.
.590	.348	.338	34.845	.000

Table 4: Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std Error	Beta		
PEU	.072	.031	.136	2.356	.019
PR	-.077	.032	-.140	-2.426	.016
PU	.304	.032	.554	9.605	.000

The results of the regression analysis conducted on the factors indicate that PR, PU and PEU were found to be the most influential factors explaining the use of e-banking services. The variables PR (t =

-2.426, $p < 0.05$), PU ($t = 9.605$, $p < 0.01$) and PEU ($t = 2.356$, $p < 0.05$) are statistically significant, the overall model was also statistically significant ($R^2 = .348$, $p < 0.001$). The adjusted R square value of 0.338 signifies that the model accounted for 33.8% of the variance in the dependent variable. The F value is 34.845 ($p < 0.000$) which is highly significant. The regression result shows that PR is negatively related to the adoption of e-banking which supports the hypothesis and is in line with the previous studies [4, 5, 9]. Also it shows that PU and PEU have positive relation with e-banking usage supporting the hypotheses. This finding refers to the fact that consumers use e-banking for the benefits and also due to its easiness in use provides. This finding is in line with other studies [6, 7, 8, 13].

Practical implication of these results is that banks need to highlight the benefits of e-banking, make it easy to use, and enhance its security to improve consumers' trust. They also need to make the consumers aware about the system by providing them about the details of the benefits associated with it and also ensuring security of the system. Banks also need to engage in security enhancement activities such as encryption, firewall, and user protection and authenticity. Trust is one of the more influential factors, implying that controlling the risk of e-banking is more important than providing benefits. This finding is particularly important for managers as they decide how to allocate resources to retain and expand their current customer base. However, building a risk-free e-banking transaction environment is much more difficult than providing benefits to customers. Therefore, e-banking companies need to search for risk-reducing strategies that might assist in inspiring high confidence in potential customers. In addition, this study suggests that banks should develop trust-building mechanisms to attract customers, such as statements of guarantee, increased familiarity through advertising, and long-term customer service.

6. CONCLUSION

The result of the study shows that PU, PEU and PR are the important determinants of e-banking adoption. This study meets the desired objective; but it suffers from one setback. The relatively small size of the sample limits generalization of the outcome of the study. By using a longitudinal study in the future, one could investigate the research model in different time periods and make comparisons, thus providing more insight into the phenomenon of e-banking adoption.

7. REFERENCES

- [1] Agarwal, R, Rastogi, S & Mehrotra, A. Customers' perspectives regarding e-banking in an emerging economy. *Journal of Retailing and Consumer Services*. 2009, 16: 340–351.
- [2] Amin, H. Internet Banking Adoption among Young Intellectuals. *Journal of Internet Banking and Commerce*. 2007, 12(3).
- [3] Barlett, M. A note on the multiplying factors for various chi square approximations. *Journal of the Royal Statistical Society*. 1954, 16: 296-298.
- [4] Bauer, KJ. Perceived Risk and Internet Banking. 2002.
- [5] Belkhamza, Z & Wafa, S. The Effect of Perceived Risk on the Intention to Use Ecommerce: The Case of Algeria. *Journal of Internet Banking and Commerce*. 2009, 14 (1).
- [6] Davis, FD. *A Technology Acceptance Model for Empirically Testing New End-Use Information Systems: Theory and Results*. MIT. Boston. 1986.
- [7] Hua, G. An Experimental Investigation of Online Banking Adoption in China. *Journal of Internet Banking and Commerce*. 2009, 14 (1).
- [8] Jane, M, Hogarth, J & Hilgert, M. The Adoption of Electronic Banking Technologies by US Consumers. *International Journal of Bank Marketing*. 2004, 22 (4): 238-359.
- [9] Jih, W, Wong, S & Chang, T. Effects of Perceived Risks on Adoption of Internet Banking Services: An Empirical Investigation in Taiwan. *International Journal of E-Business Research*. 2005, 1(1):70-88.
- [10] Kaiser, H. An index of factorial simplicity. *Psychometrika*. 1974, 39(1): 31-36.
- [11] Kamel S. The use of information Technology to Transform the Banking sector in Developing Nations. Information

Technology for Development. 2005, 11(4): 305-312.

- [12] Kannabira G. and Narayan. Deploying internet Banking and e-commerce- Case Study of a Private Sector Bank in India. *Information Technology for Development*. 2005,11(4): 363-379
- [13] Lee, M. Factors Influencing the Adoption of Internet Banking: An Integration of Tam and Tpb with Perceived Risk and Perceived Benefit. *Electronic Commerce Research and Applications*. 2009, 8: 130–141.
- [14] Liebermann, Y & Stashevsky, S. Perceived risks as barriers to internet and e-commerce usage. *Qualitative Market Research: An International Journal*. 2002, 5(4): 291-300.
- [15] Mitchell, V. Consumer perceived risk: conceptualizations and models. *European Journal of Marketing*. 199933(1/2): 163-195.
- [16] Mukherjee, A & Nath, P. A Model of Trust in Online Relationship Banking. *International Journal of Bank Marketing*. 2003, 21(1): 5-15.
- [17] Nath R. and Shrick P. and Parzinger M. Bankers Perspectives on Internet Banking. *E- Service Journal*. Indiana University Press. 2001.
- [18] Nunnally, JC. *Psychometric Theory*, McGraw-Hill. New York. 1978.
- [19] Pavlou, P. Consumer acceptance of electronic commerce: Integrating trust and risk with the Technology Acceptance Model. *International Journal of Electronic Commerce*. 2003, 7(3): 101-134.