

## **Investigation of the Effect of Customers' Perceived Risk and Uncertainty on the Usage of the Internet Banking (A Case Study of Saderat Bank of Mashhad)**

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**Abstract:** One of the most influential instruments in describing customer's behavior is the perception of risk and uncertainty which can facilitate customers' attitude towards marketers. The main aim of this study is investigating the effect of customers' perception of risk and uncertainty on the rate of using Internet Banking as a new service and enhancing the knowledge scope in this area. The examined dimensions of risk and uncertainty include 13 ones which are as follows: Security, Financial, Performance, Time, Social and Psychological risks and Consequences, Information, Knowledge, Choice, Brand, Needs and Post-purchase uncertainties. Correlation analysis and multiple regression analysis have been employed to analyze the theories. Statistical tests have indicated that the components of risk and uncertainty have negative significant relationship with the rate of Internet Banking usage. Multiple regression analysis has indicated that from 13 dimensions which has been investigated, four dimensions of Choice and consequences uncertainties and psychological and performance risks could fully explain 0/709 of variations in dependent variable of rate of internet banking usage. The choice dimension alone could explain 0/535 of the Internet Banking usage variable.

**Key words:** Customer's behavior • Perceived risk • Perceived uncertainty • Internet Banking • Services • customer's satisfaction

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### **INTRODUCTION**

Various researches have indicated that customers' perceptions, interpretations and feelings at the time of purchasing can influence their rate of acceptance, usage and abandonment of a commodity/service (especially innovative commodities and services) [1]. Additionally, it has been verified that the most fundamental perceived cases are those with which customers encounter at the time of purchasing [2]. The issue of perceived risk and uncertainty has been existed in many of applied researches since four decades ago. The concept of risk and uncertainty, in the fields of economics, psychology, statistical decision theory and game theory, are related to the choice opportunities and can accompany with positive probable consequences (profit or victory) or negative ones (loss or failure). But just negative probable consequences are being focused on at the time of customer's behavior investigation; therefore, the concept

of risk in marketing is different with its concept in other fields. When we study a customer's satisfaction, the undeniable consequence of purchasing is customer's satisfaction, so positive consequences are expected. Therefore, if negative consequences have existed at the purchasing times, we may not be able to achieve the expected satisfaction level [3]. Different dimensions of risk and uncertainty situations have been recognized in accordance with examined commodities or services. In the field of Internet Banking as a new service, the recognized dimensions of risk and uncertainty are as follows: security, financial, performance, time, social and psychological risks and consequences, information, knowledge, choice, brand, needs and post-purchase uncertainties. This research intends to study the relationship between the rates of banking usage and these dimensions. Bauer introduced the concept of risk in the field of customer's behavior for the first time in 1964 [10]. He verified that customer's behavior is in relation to

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the risk in a way that every operation may have unpleasant consequences [11]. Since cognitive difficulties, people can rarely foresee the whole probable consequences. Dowling and Staelin (1994) have pointed to the situations in which there is more uncertainty than risk in the customer's behavior at the purchasing time [12]. The difference between two words of "risk" and "uncertainty" has gradually disappeared in the researches which are related to the customer's behavior and these words were exchangeable [3]. In 1994, banks commenced surfing the internet to apply Internet Banking as a suggested delivery system for their productions and services. Web Technology let the banks offer a new and person-oriented service to the customers. The most fundamental advantage of Internet Banking is reducing bank's costs and increasing accessible bank services for the customers. Until January 1995, just 24 banks had access to the internet network but during the next year, 800 banks were added to the list. At first, the banks' websites offered just the services which had been introduced in their advertising brochures but they gradually developed their sites to be able to transfer resources, statements of accounts, mortgages, automatic loans, insurance productions, business security and so on. These advantages help the banks to compete indirectly with non-bank institutions. SFNB was the first real Internet Bank which was inaugurated in 18 October 1995 to commercial operations and smoothed the path to the Internet Banking development. Most banks nowadays give internet services to the customers as an instrument for market development, improvement of services which are given to the customers, costs-cutting and promoting the productivity [13]. With the rapid development of technologies various kinds of internet applications have become popular [14]. But use of technologies especially the internet may have effect on the behavior of users [15] and managers of organizations [17]. The extent to which customer-orientation is displayed by the organization can have an impact on the level of satisfaction experienced by customers and the quality and duration of the relationship between the organization and its customer [16]. The service quality has been regarded as the key factor in order to succeed and have endurance in banking industry especially when there has been continuously

growing pressure from other institutions working in the same industry and demanding customers requirements [18]. In recent years, the service sectors have gained a greater economic and more significant presence in the business landscape [19].

## **MATERIALS AND METHODS**

Nowadays, considering new technologies in processing and transferring information, new methods have been introduced for offering services and new economics has been influenced by electronic revelation, computers, computer networks and internet development [4]. Various researches have suggested transactions in space-market<sup>1</sup> instead of market-place [5] and banks are not excluded from this procedure. They can even facilitate the process of transaction in the virtual space and also give services through digital data. Unfortunately, statistics show that the whole capacity of virtual space in Iran is not applied to give online services and less than 40% of the people, who possess bank cards, purchase through internet and just 5.5% of the customers of enormous banks such as Saderat Bank use internet services.<sup>2</sup> Customers' tendency, acceptance and the usage of electronic banking services such as Internet Banking have direct relationship with their perception of the characteristics of expected service [6].

There are some factors, in the field of using internet methods to receive banking services, which can produce anxiety in customers and make situations in which they feel more risk and uncertainty. These factors which can also influence the rate of giving services through internet are as follows: internet expensiveness<sup>3</sup>, taking time to do banking operations through internet [2], internet destructive attacks such as theft of billions by hackers, hacking into the banks' sites<sup>4</sup>, deficiencies of social features such as honesty, unanimity and accountability in internet space [7], disability in detecting transactions, people's inadequate knowledge and skill<sup>5</sup>, being diffident about existing document and information in virtual space in comparison with the real space [8], negative outlooks on new phenomena and being diffident about institution's brand and reputation, not having the feeling of requirement to this way of accessing services, having

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<sup>1</sup> Space-market is a virtual space in which commodities and services are given digitally and on the basis of information channels

<sup>2</sup> Banks Communications Deputy, retrieved from <http://ict.news.ir>

<sup>3</sup> Motamedi Nezhad, retrieved from <http://www.magiran.com>

<sup>4</sup> Telna, retrieved from <http://iranictnews.ir>

<sup>5</sup> Khorasani, Iran Fox News, retrieved from <http://forum.parsjoommla.com>

anxiety and diffidence about post-purchase services such as legal supports, cover and so forth [9]. Considering the development of Information Technology, Electronic Business and internet distribution throughout the world and also Iran, it is an inevitable necessity to pay more attention and program in the direction of these issues. Regarding that an accurate recognition of the problems, obstacles, resources and potentialities are required of an appropriate program, the issue of investigating the perception of risk and uncertainty in Internet Banking usage is important. Some factors which increase the necessity of recognizing the customers' perceived risk and uncertainty and their management in the direction of decreasing risk and also improve their satisfaction are as follows: the development of markets and enhancement of customers' needs on account of financial reasons and prioritizing the banks based Electronic Banking to improve the competence, market share, value added of giving these services by the banks. The positive relationship, which exists between the longevity of customer's relation and his interpretation of the rate of confidence, is another factor that increases the necessity of recognizing customers' perceived risk and uncertainty. It is presently the age of knowledge and information, so Information Technology is of great importance. One of IT's applications is in the direction of Internet Banking which is advantageous to both customers and bank. This research aims to investigate and improve the customers' perception of risk and uncertainty and its effect on their usage of Internet Banking as a new service. The present research is applied and descriptive in terms of its aim and techniques which have been applied to assemble data. It is a field research in which questionnaires have been used as the instrument for collecting information. Collected data has been regulated and described through software SPSS and descriptive statistics methods and Hypotheses have been tested through correlation analysis method and multiple regression. Pearson coefficient correlation has been applied on the grounds that dependant and independent variables are on the distance measurement level. Statistics community involves the whole customers of every branch of Saderat Bank of Mashhad, whose database has been available. In this research, we have applied stratified sampling proportionate to volume and cluster to achieve a synthetic sampling. From every nine domains of Mashhad city, two branches have been chosen randomly and questionnaires have been distributed randomly between

these 18 branches' customers (based on their customer' accumulation). Following formula has been used to determine the sample's volume.

$$n = \frac{Z_{\alpha/2}^2 \cdot p \cdot (1-p)}{e^2}$$

In this formula, if confidence level is 95%, z represents the standard distribution statistics which is 1.96, p represents success probability, (1-p) represents failure probability and e, standard error level. In this research, on the basis of prudential method, success and failure probabilities have been considered 50% and e, 7%. Therefore, sample volume equals 196.

$$n = \frac{1.96^2 \cdot 0.5 \cdot (1-0.5)}{0.07^2} = 196$$

300 questionnaires have been distributed among customers but just 236 ones have been completed. After eliminating the incorrect ones, 200 questionnaires remained to be investigated for the research. To validate the research, questionnaires have been given to some lecturers, marketing experts of new banking services and operating managers to be studied. This pluralism helps the research validity. Cronbach's alpha technique has been applied to measure the research's consistency. Every variable's Cronbach's alpha has been summarized in Table 2. The total- Cronbach's alpha of the research is 0.949 which indicates high internal validity of the questionnaire.

### Research Hypotheses

**Hypothesis 1:** There is a significant negative relationship between the customers' perceived financial risk and Internet Banking usage.

**Hypothesis 2:** There is a significant negative relationship between the customers' perceived operational risk and Internet Banking usage.

**Hypothesis 3:** There is a significant negative relationship between the customers' perceived social risk and Internet Banking usage.

**Hypothesis 4:** There is a significant negative relationship between the customers' perceived time risk and Internet Banking usage.

Table 1: The obtained coefficients of every variable's Cronbach's alpha

Variable	Alpha	Variable	Alpha	Variable	Alpha	Variable	Alpha	Variable	Alpha
Financial	0.87	Social	0.747	psychological	0.768	Knowledge	0.86	Needs	0.769
Operational	0.808	Time	0.809	Security	0.869	information	0.836	brand	0.822
Choice	0.82	consequences	0.872	Post-purchase	0.816				

Table 2: Correlation coefficient between the dimensions of perceived risk and uncertainty and Internet Banking usage

Dimensions	Internet Banking Correlation coefficient	Dimensions	Internet Banking Correlation coefficient
Financial	-0.633	Knowledge	-0.700
Security	-0.558	Information	-0.656
Social	-0.382	Post-purchase	-0.681
Psychological	-0.708	Needs	-0.493
Operational	-0.510	choice	-0.726
Time	-0.628	Consequences	-0.711
Brand	-0.388		

**Hypothesis 5:** There is a significant negative relationship between the customers' perceived psychological risk and Internet Banking usage.

**Hypothesis 6:** There is a significant negative relationship between the customers' perceived security risk and Internet Banking usage.

**Hypothesis 7:** There is a significant negative relationship between the customers' perceived knowledge uncertainty and Internet Banking usage.

**Hypothesis 8:** There is a significant negative relationship between the customers' perceived information uncertainty and Internet Banking usage.

**Hypothesis 9:** There is a significant negative relationship between the customers' perceived needs uncertainty and Internet Banking usage.

**Hypothesis 10:** There is a significant negative relationship between the customers' perceived brand uncertainty and Internet Banking usage.

**Hypothesis 11:** There is a significant negative relationship between the customers' perceived post-purchase uncertainty and Internet Banking usage.

**Hypothesis 12:** There is a significant negative relationship between the customers' perceived consequences uncertainty and Internet Banking usage.

**Hypothesis 13:** There is a significant negative relationship between the customers' perceived choice uncertainty and Internet Banking usage.

## RESULTS AND DISCUSSIONS

First of all, we have had a general outlook on the sample's essential features. 200 questionnaires have been distributed between 41 females and 159 males. In terms of education, 15.5% did not have high school diploma, 25.5% had high school diploma, 18.5% two-years college diploma, 33.5% BA, 4.5% MA and 2.5% Ph. D. and beyond. In terms of their type of business, 22.5% had been involved in financial services jobs (such as insurance company or bank), 20.5% in other services, 6% in production, 7% in architecture and engineering, 22.5% in wholesale and retail, 4.5% in legal jobs, 3% in transportation, 2.5% in medical positions, 2% in import and export and 9.5% in other businesses. In terms of job ranking, 13% were laborers, 30% staffs, 4.5% experts, 20.5% managers, 2% pensioners, 19.5% sellers, 2.5% house keepers and 8% other jobs. The distribution of dependant variable has indicated that 60% of these people do not or rarely use the facility of Internet Banking and its services. 21% of the customers sometimes and 19% often use Internet Banking to be given the mentioned services. Table 3 shows the result of Pearson correlation test between the dimensions of perceived risk and uncertainty and Internet Banking usage.

Inasmuch as the dimensions of perceived risk and uncertainty have been considered in a perceptual unit, multiple regression analysis has been applied to make the dimensions more clear. On the basis of this method, variables have been measured with each other to make the dependent variables more clear and therefore, through measuring coefficient correlations, just the variables which had a pure significant effect on elucidating the variance of dependant variable, have been determined. Table 4 indicates the result of multiple regression analysis.

Table 3: Principal elements of multi-variable analysis based on multiple regression method

Model	Entered variables	R	R <sup>2</sup>	Reformed R <sup>2</sup>	Error standard of test
1	Choice uncertainty	0.732	0.535	0.530	3.634
2	Psychological risk	0.811	0.658	0.650	3.136
3	Consequences uncertainty	0.831	0.690	0.680	2.999
4	Operational risk	0.842	0.709	0.696	2.924

Table 4: ANOVA results from regression to test the research significance

Model	Squares	Degrees of freedom	Squares' average	F	Sig
1	Regression	1430.888	1	1430.888	108.331
	residual	1241.602	94	13.209	
	Total	95	2672.490		
2	Regression	1757.777	2	878.889	89.358
	residual	914.712	93	9.836	
	Total	2672.490	95		
3	Regression	1844.978	3	614.993	68.373
	residual	827.511	92	8.995	
	Total	2672.490	95		
4	Regression	1894.252	4	473.563	55.374
	residual	778.237	91		
	Total	2672.490	95	8.558	

Table 5: Parameters' estimations (principal elements of regression equation)

Model		Non-standard coefficients		standard coefficients		Sig
		B	B's standard error	Beta	T	
1	Fixed coefficient (â)	22.015	1.025		21.484	0.000
	Choice uncertainty	-1.267	0.122	-0.732	-10.408	0.000
2	Fixed coefficient (â)	23.703	0.931		25.447	0.000
	Choice uncertainty	-0.899	0.123	-0.519	-7.312	0.000
	Psychological risk	-0.475	0.082	-0.409	-5.765	0.000
3	Fixed coefficient (â)	24.218	0.906		26.731	0.000
	Choice uncertainty	-0.621	0.148	-0.359	-4.210	0.000
	Psychological risk	-0.384	0.084	-0.330	-4.561	0.000
	Consequences uncertainty	-0.488	0.157	-0.279	-3.114	0.002
4	Fixed coefficient (â)	25.362	1.004		25.267	0.000
	Choice uncertainty	-0.551	0.147	-0.318	-3.748	0.000
	Psychological risk	-0.339	0.084	-0.292	-4.028	0.000
	Consequences uncertainty	-0.451	0.153	0.258	-2.942	0.004
	Operational risk	-0.290	0.121	-0.161	-2.400	0.018

Multi-variable regression, as a method of elucidating the rates of Internet Banking usage, has indicated that of total 13 variables, 4 variables of choice, psychological and consequences risks and uncertainties could respectively enter the contracts and elucidate 0.709 of changes in the dependant variables. The choice dimension alone could elucidate 0.535 of variable of Internet Banking usage. Considering that 70.9% of the variance of Internet Banking usage have been determined through these variables; therefore, 1- R<sup>2</sup>=29.7% of the variance of dependant variable have not been analyzed through our variables. By and large, the obtained coefficient indicates that regression equation is an appropriate method to predict the dependant variable. Table 5 shows the significance of square amount of multiple correlation

coefficient of R<sup>2</sup> which has been put in ANOVA table and has been acknowledged through F test.

Table 6 shows the principal elements of regression equation, statistics indexes for the variables of the equation like regression coefficient (b) for raw grades and â for standard grades and also T test.

Considering the above table, the obtained multivariable regression equation, which is required to predict the dependant variable and consist of four principal variables, will be as following:

$$y = 25.362 - (0.290) - x_1 (0.451) - x_2 (0.339) - x_3 (0.0551) - 25.362 = x_4$$

in which

Table 6: Elements which were out of the equation in the fourth stage

Fourth stage model	Beta	T	Sig	Slight correlation
Financial risk	-0.027	-0.0386	0.0700	-0.041
Security risk	-0.050	-0.615	0.540	-0.065
Social risk	-0.110	-1.898	0.061	-0.196
Time risk	-0.076	-1.081	0.283	-0.113
Brand uncertainty	-0.108	-1.579	0.118	0.164
Knowledge uncertainty	-0.063	-0.798	0.427	-0.084
Information uncertainty	-0.100	-1.309	0.194	-0.137
Post-purchase uncertainty	0.039	0.445	0.658	0.047
Needs uncertainty	-0.105	-1.510	0.135	0.157

- Represents the predicted grade of the rates of Internet Banking usage
- $x_1$  Represents choice uncertainty
- $x_2$  Represents psychological risk
- $x_3$  Represents consequences uncertainty
- Represents operational risk

Table 7 indicates the independent variables which have not been entered to the regression equation in the fourth stage.

T test, which has been applied for the slight correlation of variables out of the equation with the dependant variable (Internet Banking usage), makes it clear that none of the variables could add any significant rate to the  $R^2$ . In other words, added rates were not significant and did not enter to the equation.

### CONCLUSION

Internet Banking usage has a weaker negative relationship with some dimensions such as brand and needs uncertainties and social risk. It has a strong negative relationship with some other dimensions like choice, consequences and knowledge uncertainties and psychological risk. From the weak relationship between brand dimension and Internet Banking usage, we can conclude that although the studied institution could not remove this anxiety, it succeeded in offering new services to its customers. Additionally, the weak negative relationship between social risk and Internet Banking usage is an indication of customers' high social class among their families, friends, colleagues and so on. Weak relationship between needs uncertainty and Internet Banking usage shows the first customers' acceptance of this channel of giving services. Customers have felt the necessity of using Internet Banking but the strong relationship between choice uncertainty and Internet Banking is a sign of their doubt to choose it. There are many factors which make them doubtful such as inclination to traditionalism or some substitute methods,

little knowledge and so forth. The elements, which increase this doubt and make customers to choose other methods except Internet Banking, are consequences, knowledge and information uncertainties and psychological risk which have high positive correlation with choice uncertainty. We may conclude the above findings from investigating the factors independently, but the positive relationship, which exists between risk's and uncertainty's dimensions, is an undeniable indication of a significant relationship and interaction between the perceived dimensions of risk and uncertainty. Multiple regression analysis has been applied to prove this relationship. To amplify the dependant variable of Internet Banking usage, the perceived dimensions of risk and uncertainty have been entered simultaneously and it has indicated that among 13 independent variables of research model, 4 variables of choice uncertainty, psychological risk, consequences uncertainty and operational risk have been entered the equation respectively and could surely elucidate 0.709 of changes in the dependant variable of Internet Banking usage. Among these 4 variables, choice dimension alone could elucidate 0.535 of changes in Internet Banking usage variable. Choice uncertainty as the most influential variable in using Internet Banking indicates that changes in technology and customers' needs challenge their thoughts and inaugurate their mental conflicts about choosing the channel of receiving banking services and Internet Banking as a self-service facility. Considering the significant negative relationship between risk's and uncertainty's dimensions and Internet Banking usage, it is proposed to pay more attention to this perceptual obstacle besides other barriers of accepting and using new services. Regarding that the most stressful factor about which customers are worried is choice uncertainty, it is suggested that the process of choosing new services by customers needs special attention and noticing that psychological risk has an important role in the rates of Internet Banking usage and it has complicated dimensions on its own which affect both directly and indirectly on the dimensions of risk and

uncertainty, it is offered that in addition to investigating people's degree of risk acceptance, particular programs should be planned to decrease this risk. Seeing the strong relationship between knowledge and choice uncertainties, it is proposed to provide training courses consisting of computer knowledge, banking and economical knowledge, internet communications knowledge and etc. (inside the institution, customers or society) to reduce this anxiety.

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