Study of Factors Influencing the Use of Internet Banking Services by the Customers of the Parsian bank in Iran

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ABSTRACT

Internet banking is one of the most important methods of conducting monetary transactions faster, at a lower cost, and in a virtual environment. This research was carried out by using the Decomposed Theory of Planned Behavior (DTPB), to which the construct of "trust" was added, with the purpose of identifying factors influencing the use of internet banking among bank customers in Iran.

In this study, the four variables of "attitude", "subjective norms", "perceived behavioral control", and "trust" were considered as the independent variables; and questionnaires were used to gather data. This research was conducted by using the "descriptive – survey" method on a sample consisting of 384 customers of the Parsian bank in the province of Tehran.

Our research findings show that there is a significant relationship between the constructs of "attitude", "perceived behavioral control", and "trust", and "the use of internet banking services", but that the relationship between the constructs of "subjective norms" and "the use of internet banking services" is not significant. Furthermore, the construct "attitude" was found to be the strongest variable in the use of internet banking.

KEY WORDS: Internet banking, information technology, attitude, trust.

INTRODUCTION

Electronic banking is one of the information technologies intended to eliminate the two constraints of time and place from banking services. The need for an efficient banking system to be present in world markets and to compete with other banks necessitates that electronic banking should be propounded as a necessity and not as a choice. Electronic banking includes all electronic channels customers use to access their accounts, to transfer cash between their accounts, or to pay bills. These channels comprise the internet, cell phones, fixed phones, digital televisions, and automatic teller machines (Lu, J.; Yu, C.S. et al., 2005, 58).

In this study, the emphasis is on conducting electronic banking through the internet. Electronic banking is a method of electronically offering banking services and products in which the internet plays the key and central role in offering banking services and products. Moreover, this banking method has caused the expansion of the use of the internet in electronic banking (Furst, 2000).
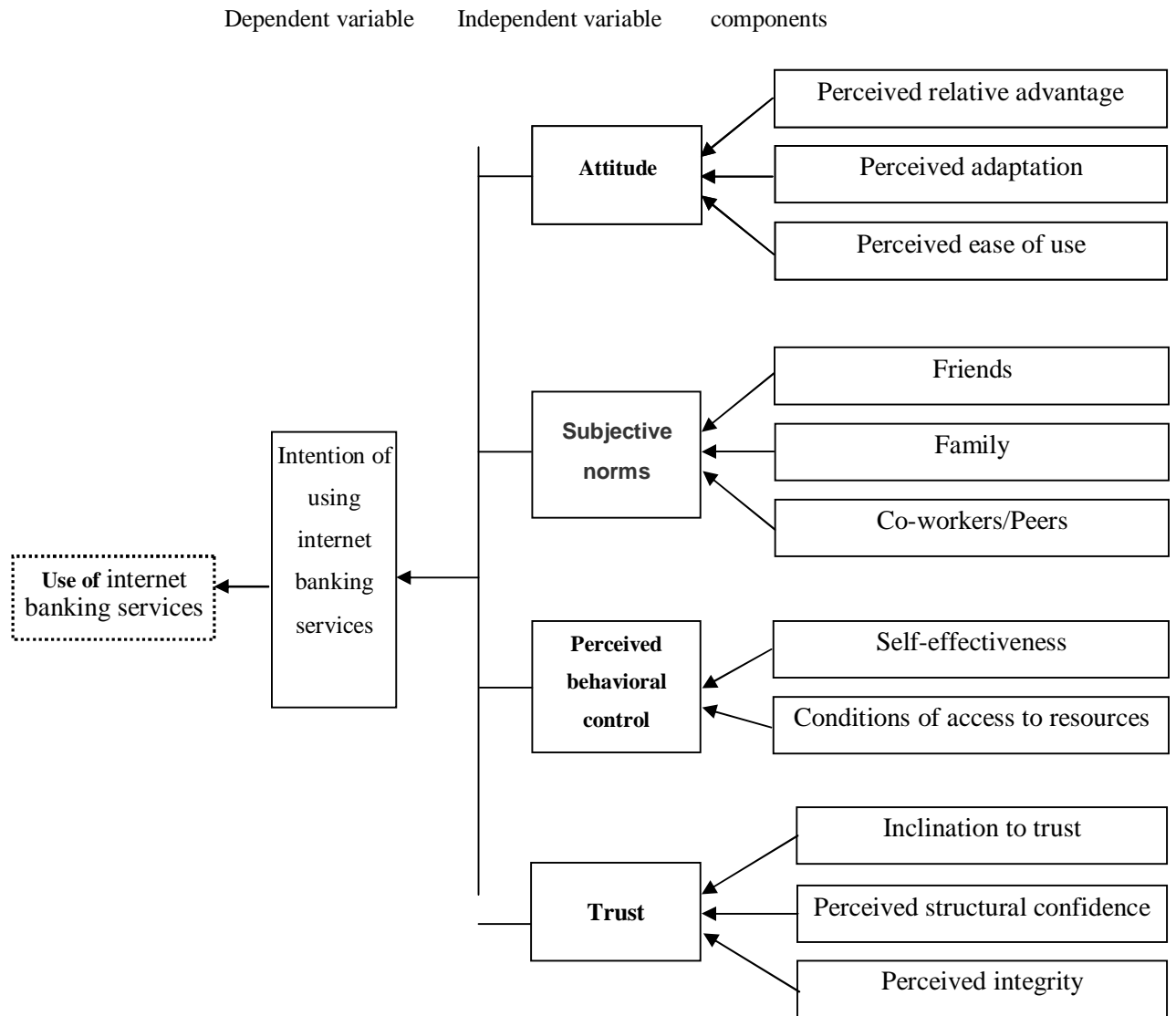
The goals of this research can be expressed as follows:
1. To study and identify the advantages and the shortcomings of the internet banking system
2. To identify and prioritize factors influencing the acceptance of internet banking among the customers of the Parsian bank
3. To help develop the ease of banking services and facilities for the customers

Model 1 – 1 below shows the conceptual model used in this study:

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Dependent variable   Independent variable   components

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                                                          ┌─────────────────────────────┐
                                                          │  Perceived relative advantage│
                                                          └─────────────────────────────┘
                                          ┌──────────┐    ┌─────────────────────────────┐
                                          │ Attitude │◄───│     Perceived adaptation    │
                                          └──────────┘    └─────────────────────────────┘
                                                          ┌─────────────────────────────┐
                                                          │     Perceived ease of use   │
                                                          └─────────────────────────────┘
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Diagram:

- **Intention of using internet banking services** → **Use of** internet banking services

- **Attitude** ← Perceived relative advantage, Perceived adaptation, Perceived ease of use
- **Subjective norms** ← Friends, Family, Co-workers/Peers
- **Perceived behavioral control** ← Self-effectiveness, Conditions of access to resources
- **Trust** ← Inclination to trust, Perceived structural confidence, Perceived integrity

Source: Khalil, M. D. Noor and J. Michael Pearson, 2008, 39)

The following four hypotheses are set forth in this study:

Hypothesis number 1: There is a significant relationship between attitude toward internet banking and the use of internet banking.

Hypothesis Number 2: There is a significant relationship between subjective norms and internet banking.

Hypothesis number 3: There is a significant relationship between perceived behavioral control and the use of internet banking.

Hypothesis number 4: There is a significant relationship between trust in internet banking and the use of internet banking.

TYPE AND METHODOLOGY OF RESEARCH

This is an applied study as far as its goals are concerned. In applied research, the main goal is not to make scientific discoveries but rather to test and investigate the possibility of putting knowledge into practice. For example, in education, applied research chooses its subjects from among the everyday problems and difficulties faced in education (Delavar, 2007, 31). The method used in this study is a descriptive – survey one. In other words, this research deals with an orderly and systematic description of the current situation in electronic banking, investigates the characteristics and features of electronic

banking, and studies the relationships between the related variables of internet banking as needed (Hafeznia, 2007, 58).

The theoretical bases of the research and the related literature

The acceptance of technology is specifically related to the inclination of people to accept and adopt products and services based on technology for everyday use at home and at work and, hence, it is a measure of subjective acceptance. It is important to understand that accepting technology is not a measure of technical competence: there are many people who are technically competent but still do not have any inclination to use technology.

Due to the importance of the subject of this study, an attempt has been made in this research to design and test (on the basis of the decomposed theory of planned behavior, to which the construct of trust has been added, to expand the model in mind) research hypotheses for this study, with an emphasis on the acceptance of internet banking by the customers of the Parsian bank in the province of Tehran. The decomposed theory of planned behavior is a product of the combination of two models: the innovation diffusion model and the planned behavior model.

The innovation diffusion theory (IDT)

This theory was introduced in the 1960s for the purpose of explaining the process of adaptation to technology. Further research resulted in the expansion of this model by Rogers who proposed a model for this theory in 1983.He defined innovation as an idea, experience, or anything else that is new for the people or entities using the innovation. He also defined diffusion as a process that at all times, and through special channels, establishes relationships between a society and its members. Therefore, the decomposed theory of planned behavior deals with how new ideas and concepts are widely accepted (Naimi Baraghani, S., 2007, 35).

The theory of planned behavior (TPB)

The theory of planned behavior, introduced by Ajzen in 1985, seeks to use the construct of perceived behavior control in order to predict involuntary behavior. In this theory, behavior itself is a function of intention and behavioral intention is affected by attitudes toward behavior, subjective norms, and perceived behavioral controls. The factors constituting intention (attitudes, subjective norms, and perceived behavioral controls) form a subset of (attitudinal, normative, and controlling) opinions through the use of a construct (C. Hernandez & Mazzon, 2007, 79)

The decomposed theory of planned behavior (DTPB)

The decomposed theory of planned behavior was introduced by Taylor and Todd in 1995. They showed that attitudinal opinions must be decomposed to better understand the relationships between the structure of opinions and the foregrounds of intentions (Shih, Y.; Fang, K., 2004, 216). Taylor and Todd combined constructs from Ajzen's theory of planned behavior (1991) with Roger's innovation diffusion theory (1983) and expanded the decomposed theory of planned behavior by decomposing the constructs of attitudes, subjective norms, and perceived behavioral control.

Descriptive statistics and bar graphs used for obtaining the means of the scores of indices

Table 1 – 2: Means of the scores of the indices

Indices	Lowest score	Highest score	Means of scores	Standard deviation
Attitude	1.00	5.00	4.1571	0.67126
Subjective norms	1.oo	5.00	1.9557	0.85406
Perceived behavioral control	1.20	5.00	3.3417	0.80995
Trust	1.00	4.88	2.9538	0.70848
Use of internet banking services	1.00	5.00	3.4603	1.05320

According to Table 1 – 2, the indices of attitude , use of internet banking services , perceived behavioral control , trust , and subjective norms with mean scores of 4.1571 , 3.4603 , 3.3417 , 2.9538 , and 1.9557 rank first to fifth , respectively.

Statistical analysis and investigation of research hypotheses

To study the relationships between the independent variables of attitude, subjective norms, perceived behavioral control, and trust and the dependent variable of the use of internet banking services, the parametric test (i.e., Pearson correlation coefficient) was used because the variables were normal. Multiple

linear regressions were used to investigate the effects of the independent variables of attitude, subjective norms, perceived behavioral control, and trust on the dependent variable of the use of internet banking services. In the multiple linear regression, first the ANOVA test (analysis of variance or linearity of the regression), the Durbin – Watson test (self – correlation of the perturbation terms), the Kolmogorov – Smirnov test (normality of the remainders), and the nonlinearity test were used to confirm the model. Then, nonstandard coefficients were employed to obtain the regression equation. This equation was used to predict the values of the dependent variable through using the values of the independent variables. Finally, the standard coefficients were used to calculate the effects of each of the independent variables on the dependent variable and to perform path analysis.

Pearson correlation coefficient
Hypothesis number 1: There is a significant relationship between the attitude to internet banking and the use of internet banking.
Realization condition: If the value of the significance level is less than that of the error rate of 0.05, the H_0 hypothesis is rejected; otherwise there is no reason for rejecting this hypothesis.

Graph and Table 1 – 3: Results of the coefficient correlation test of the two variables of "attitude" and "the use of internet banking services"
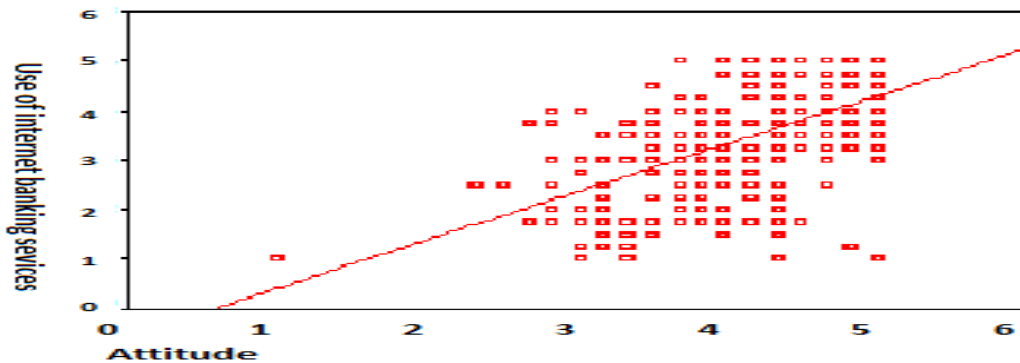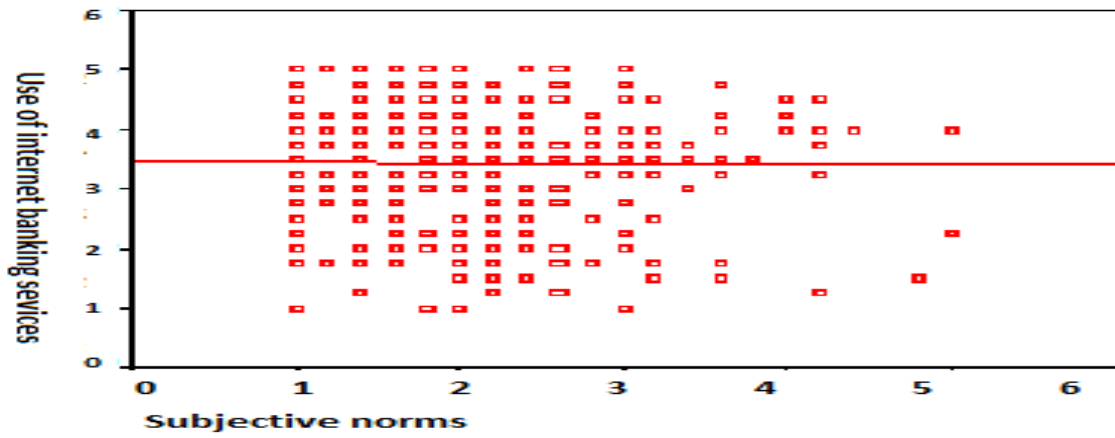

Level of significance	Error rate	Conclusion	Correlation coefficient
0.000	0.05	The two variables are related	0.614

According to Table 1 – 3, since the value of the significance level (0.000) is less than that of the error rate (0.05), we conclude that the alternative hypothesis holds true: there is a significant relationship between these two variables. The correlation coefficient is 0.614, and this shows that there is a direct (positive) correlation between attitude toward internet banking and the use of internet banking services. Therefore, hypothesis number 1 is confirmed: there is a (direct) significant relationship between attitude toward internet banking and the use of internet banking.

Hypothesis number 2: There is a significant relationship between subjective norms and the use of internet banking.
Realization condition: If the value of the level of significance is lower than that of the error rate of 0.05, the H_0 hypothesis is rejected; otherwise there is no reason for rejecting this hypothesis.

Graph and Table 1 -4: Results of the correlation coefficient test of the two variables of "subjective norms" and "the use of internet banking"
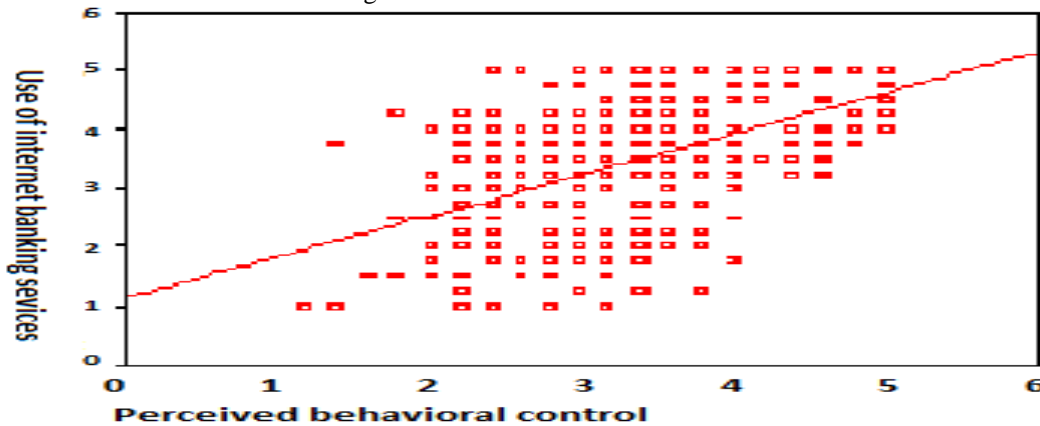
Level of significance	Error rate	Conclusion	Correlation coefficient
0.942	0.05	The two variables are not related	-0.004

According to Table 1 -4, since the value of the level of significance is 0.942, which is higher than that of the error rate of 0.05, we conclude that there is no significant relationship between these two variables. Therefore hypothesis number 2 is rejected: there is no (direct) significant relationship between subjective norms and the use of internet banking services.

Hypothesis number 3: There is a significant relationship between perceived behavioral control and the use of internet banking services.

Realization condition: If the value of the level of significance is less than that of the error rate of 0.05, the H_0 hypothesis is rejected; otherwise there is no reason for rejecting this hypothesis.

Graph and Table 1 – 5: Results of the correlation coefficient test of the two variables "perceived behavioral control" and "the use of internet banking services"
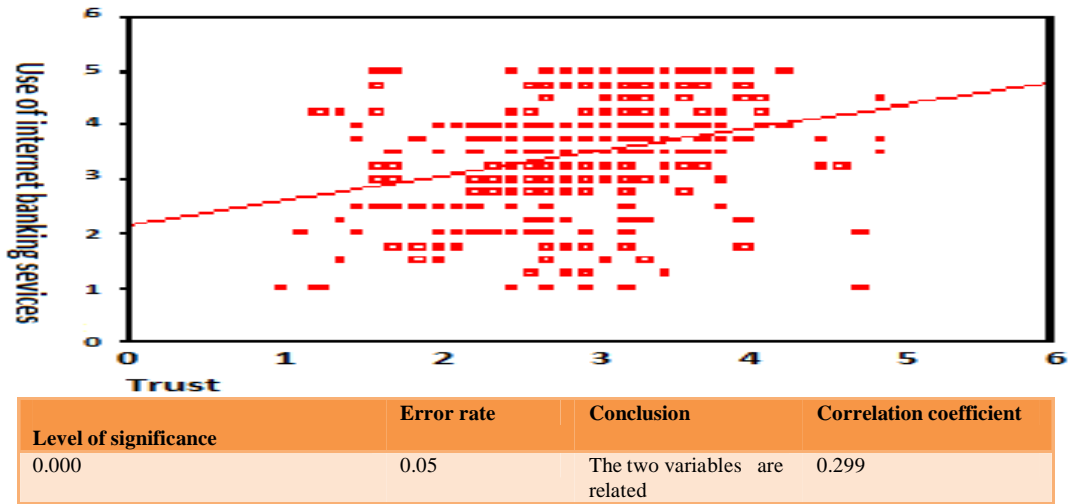

Level of significance	Error rate	Conclusion	Correlation coefficient
0.000	0.05	The two variables are related	0.534

According to Table 1 – 5, since the value of the level of significance (0.000) is less than that of the error rate (0.05), the alternative hypothesis holds true: there is a significant relationship between these two variables. The correlation coefficient is 0.534, and this indicates there is a direct (positive) correlation between perceived behavioral control and the use of internet banking services. Therefore, hypothesis number 3 is confirmed: there is a (direct) significant relationship between perceived behavioral control and the use of internet banking services

Hypothesis number 4: There is a significant relationship between trust in internet banking and the use of internet banking services.

Realization condition: If the value of the level of significance is less than that of the error rate of 0.05, the H_0 hypothesis is rejected; otherwise there is no reason for rejecting this hypothesis.

Graph and Table 1 – 6: Results of the correlation coefficient test of the two variables "trust" and "the use of internet banking services"

Level of significance	Error rate	Conclusion	Correlation coefficient
0.000	0.05	The two variables are related	0.299

     According to Table 1 – 6, as the value of the level of significance (0.000) is less than that of the error rate (0.05) , we conclude there is a significant relationship between these two variables. The correlation coefficient is 0.299, which shows there is a direct (positive) correlation between trust in internet banking and the use of internet banking services. Therefore, hypothesis number 4 is confirmed: there is a (direct) significant relationship between trust in internet banking and the use of internet banking services.

Tolerance and multiple common linear relationships
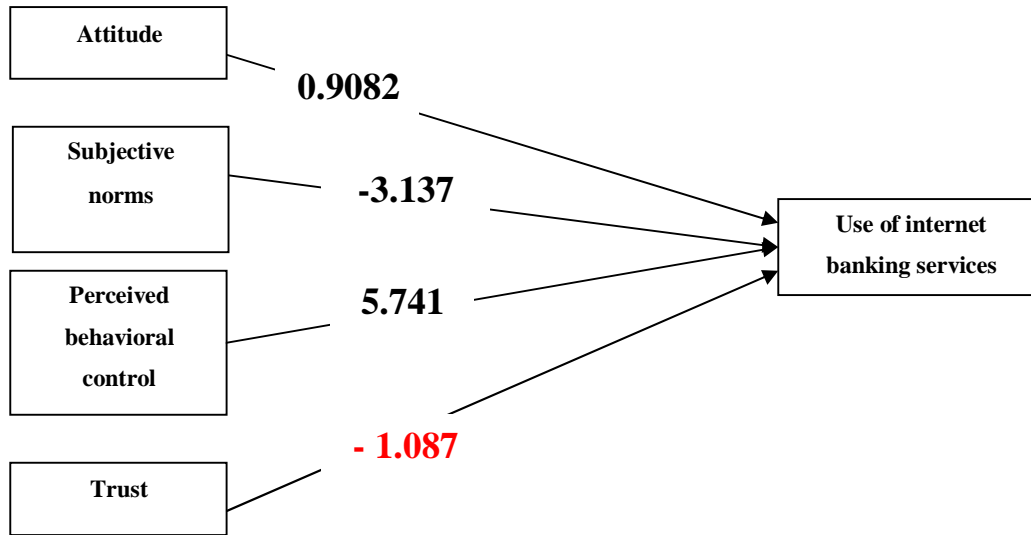   If all the tolerances are small, the presence of a common linear relationship may pose a problem for the data; and if the tolerances are close to one, we will have a very appropriate situation in the model. The value of tolerance must be larger than 0.1 and the value of VIF must be less than 10. One of the methods of recognizing the presence of collinearity is the use of the variance inflation factor (VIF). The value of the variance inflation factor for independent variables is often used as an index for measuring the degree of collinearity in the model.

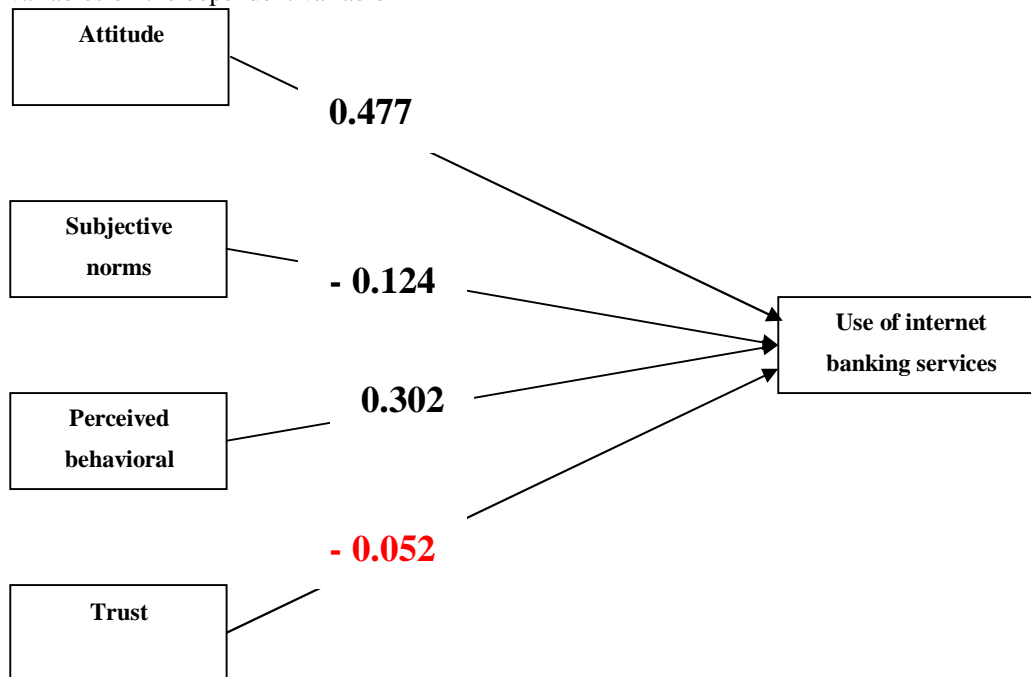Table 1 – 7: Determining the degree of tolerance of the variables

Independent variables	Tolerance	VIF
Attitude	0.628	1.593
Subjective norms	0.940	1.063
Perceived behavioral control	0.535	1.869
Trust	0.654	1.529

According to Table 1 – 7, the values of tolerance for all three independent variables are larger than 0.1, and the values of VIF are less than 10. Therefore the present situation is very desirable and there is no collinearity.

Graph 1 – 8: The use of the t – statistic in investigating the significance of the effects of the independent variables on the dependent variable

```
Attitude
                    0.9082
Subjective
  norms            -3.137
                                    Use of internet
                                   banking services
Perceived
behavioral          5.741
 control
                  - 1.087
Trust
```

Graph 1 – 9: The use of the standard coefficient to show the extent of the effects of the independent variables on the dependent variable

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Attitude
                    0.477
Subjective
  norms            - 0.124
                                    Use of internet
                                   banking services
Perceived
behavioral          0.302

                  - 0.052
Trust
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To study the present situation with regard to the variables of the use of internet banking services , attitude , subjective norms , perceived behavioral control , and trust (in internet banking) , the single sample parametric t – test is used because the variables are normal. Finally, the Friedman test is employed to rank the four indices (of the independent variables) of attitude, subjective norms, perceived behavioral control, and trust in internet banking.

The single- sample t – test

This test is used to investigate the present situation of the indices of internet banking services, attitude, subjective norms, perceived behavioral control, and trust.

$$H_0: \mu = 3$$

$$H_1: \mu \neq 3$$

Table 1 – 10: Results of the single – sample t – test

Indices	t statistic	Mean	Level of significance	95% confidence interval for difference		Conclusion
				Lower limit	Upper limit	
The use of internet banking services	8.564	3.4603	0.000	0.3546	0.5660	High
Attitude	33.779	4.1571	0.000	1.0898	1.2245	High
Subjective norms	-23.960	1.9557	0.000	-1.1300	-0.9586	Low
Perceived behavioral control	8.266	3.3417	0.000	0.2604	0.4229	High
Trust	-1.279	2.9538	0.202	-0.1173	0.0249	Average

According to Table 1 – 10, since the value of the levels of significance for the indices of the use of internet banking, attitude, perceived behavioral control, and trust in internet banking are smaller than that of the error rate of 0.05, the lower and the upper limits are positive. Therefore, all three indices enjoy a relatively high position. However, the level of significance for the index trust in internet banking is greater than 0.05; and, hence, this index possesses an average position and its population mean is identical to the middle term. Furthermore, since the value of the level of significance for the index of subjective norms is lower than that of the error rate of 0.05, the lower and the upper limits are negative; and, hence, this index enjoys a relatively low position.

The Friedman test

Table 1 – 11: Results of the Friedman test for ranking the four indices

Index	Average rank
Attitude	3.82
Subjective norms	1.26
Perceived behavioral control	2.69
Trust	2.23

H_0 : There are no significant differences among the four indices (of attitude, subjective norms, perceived behavioral control, and trust)

H_1 : There are significant differences among the four indices (of attitude, subjective norms, perceived behavioral control, and trust)

Table 1 – 12: Results of the Friedman test on the indices

Level of significance	Error rate	Confirmation of the hypothesis	Conclusion
0.000	0.05	H_1	There are significant differences

According to Table 1 – 12, the value of the level of significance (0.000) is lower than the error rate (0.05), and we conclude that the H_1 hypothesis holds true: there are significant differences among the four indices.

Therefore, taking the results of the Friedman test and the means of the rankings of the indices into account, we rank these four indices.

Table 1 – 13: Ranking the factors influencing the acceptance of internet banking

Rank	Variable
First	Attitude
Second	Perceived behavioral control
Third	Trust
Fourth	Subjective norms

Conclusions and analysis

The first finding (Hypothesis number 1): The value of the correlation coefficient is 0.614, and this indicates that there is a direct (positive) correlation between the attitude to internet banking and the use of internet banking services. Therefore, hypothesis number 1 is confirmed.

The second finding (Hypothesis number 2): The correlation coefficient of testing hypothesis number 2 at the confidence level of five percent is -0.004. Therefore, we conclude that there is no significant relationship between these two variables: hypothesis number 2 is not confirmed.

The third finding (Hypothesis number 3): The correlation coefficient of testing hypothesis number 3 at the 5 percent confidence level is 0.534.Therefore; there is a significant relationship between these two variables. The value of the correlation coefficient shows there is a direct (positive) correlation between the perceived behavioral control and the use of internet banking services. Therefore, hypothesis number 3 is confirmed.

The fourth finding (Hypothesis number 4): The correlation coefficient of testing hypothesis number 4 at the 5 percent confidence level is 0.299. Therefore, we conclude that there is a significant relationship between these two variables. The value of the correlation coefficient indicates a direct (positive) correlation between the trust in internet banking and the use of internet banking services. Therefore, hypothesis number 4 is confirmed.

The fifth finding: The use of the Friedman test showed that, for the respondents, the variables attitude and subjective norms are the most and the least important variables, respectively.

Suggestions

1. Greater attention should be paid to using advertisements and to informing the public through various media, such as broadcasting prime – time advertisements on television. In these advertisements, it is better to emphasize the advantages and the usefulness of these services for the customers, and to show them how they can improve their performance and productivity through using this technology. The construct of attitude, as the most powerful variable, indicates that the customers of this bank (The Parsian bank in the province of Tehran) are widely influenced by their perception of the performance of internet banking and of the advantages of using internet banking services.
2. Based on the results obtained from hypothesis number 3, the provision of technical constructs required for internet banking, and creating confidence in customers that they can easily access the tools and technology required for using these services, are a suitable method for encouraging people to use internet banking services.
3. Based on the results obtained from hypothesis number 4, the following strategies are recommended for increasing the confidence of customers in internet banking:
- The conditions and regulations concerning agreements involving internet banking services offered to customers be reviewed.
- Granting low – interest facilities or interest – free loans to people who have incurred losses due to the weakness of security systems of such exchanges, or compensating the very losses they have suffered in case there is sufficient evidence in this regard.
- Taking effective actions with the purpose of increasing the security level of internet banking web sites and with the goal of providing information concerning security and web security certificates such as the International Security Certificate 10 SLL.
- Customers should be given sufficient confidence and assurance that in internet banking, as in traditional banking, personal information and privacy of customers are protected, and that there is enough security in internet banking for carrying out exchanges and for making cash transfers.
- Customers be given practical confidence that processes carried out in this bank(The Parsian bank of the province of Tehran) in traditional and internet banking enjoy the necessary transparency , and that this bank considers itself bound to be accountable to its customers and to obviate their concerns.

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