An Exploratory Research on Factors Influencing Individuals' Adoption of Internet Banking in Turkey

Burak Merdenyan, Onur Cikrikcili, Orkun Kocyigit, Michelle Yeo Sook Chin, Y. Batu Salman

Abstract—Understanding the primary determinants of internet banking (IB) adoption has become crucial both for banks and clients. The factors that influence the use of this technology in Turkey were discussed within the framework of a widely used model; Technology Acceptance Model (TAM). Trust and self-efficacy were added as external variables to improve the strength of the modified model. We designed a questionnaire and used it to survey randomly selected sample of active IB users in Istanbul. It was collected 469 valid responses. The inner relationships between all variables were examined. It was found that the perceived usefulness, perceived ease of use, and self-efficacy have a positive and strong association with the intention to use IB services. This study contributes the literature by validating TAM to predict IB adoption, and the findings would encourage designing innovative marketing and management banking strategies.

Keywords—internet banking, technology acceptance model, trust, self-efficacy, adoption.

I. Introduction

Communication, information, and entertainment were all converged to assist daily activities. During the past century, adoption of computer systems has become a common method for connecting separate communities and organizations. Internet has been growing and providing various web-based applications and services to individuals and organizations [1].

The explosion of technology provided a major change in banking industry by converting paper based on-site transactions into electronic and networked banking services. The evolution of banking has been driven by improvements in the delivery channels such as automated teller machines, phone-banking, internet banking (IB), and most recently mobile banking [2]. The demands and expectations of customers were increased for the services provided by banks with the improvements in remote technologies. Financial institutions are establishing innovative solutions to meet the challenges of the changing environment [3]. Predicting new requirements have become crucial in order to dominate the highly competitive industry.

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IB uses emerging technologies such as WWW and Internet. There are significant advantages of IB both for banks and clients. IB enhances system quality, requires less staff, reduces cost, provides convenience, and speed [4, 5]. IB enables consumers to have direct access to their own financial information and let them operate their financial transactions without time and location restrictions [6]. However, IB has not taken off in Turkey as significantly as expected. 34% of the Turkish population has desktop computers, 22% has laptops or tablet PCs, 92% has mobile phones, and 1% has palms in 2011. The exact number of Internet users in Turkey was 29 million in 2010. The number of active IB users was 8.1 million in 2012. Approximately 14% of the whole population is using IB services [7]. In cyber age, the number of IB users should be increased and supportive methods to people for adoptions must be generated. Initially, clients need to be encouraged and feel secure with the use of such services.

The combination of internet and banking services is a rich and significant research context. Although many researchers conducted an investigation on the affinity between influential factors on customers and the intention to use of IB, there is limited empirical work in Turkey [4, 5, 8, 9]. Informative content and usefulness of the system are considered as two essential factors for IB adoption [4, 7, 8]. Security and trust are also significant parameters in affecting the customer's satisfaction and intention to use [10, 11]. Majority of the clients have concern about the transaction security [10]. Lack of clarity and consistency can certainly lead to loss of trust [12].

Al-Somali (2009) found that internet connection speed, attitude, subjective norm and awareness have high impact on user adoption of IB [4]. Performance expectancy, social influence, and risk were also signified as important predictors [13]. It is necessary for banks to understand that the provided financial services over the internet must be considered on a wider scale to fulfill the necessity of the future, not only the needs of present time [10].

The most well-known models at the individual level which were used to explain the association between intentions and user attitudes or behaviors are Theory of Reasoned Action (TRA) [14], Theory of Planned Behavior (TPB) [15], and Technology Acceptance Mode (TAM) [16]. TAM has become a widely used model in predicting the acceptance of a new service or application, and recently used by several researches [17, 18].

This paper examines the factors that affect the adoption of IB by Turkish financial consumers. We implemented TAM as the base model. Several significant external variables have received great interest in related researches. The model employs trust and self-efficacy, in addition to perceived usefulness and perceived ease of use, intention to use, and

actual use of IB. The data collection was conducted by an online survey and 479 valid responses were obtained. It was also clarified which factors are more influential in affecting the actual use of IB, and the inner-relationships between all variables were identified. It was found that the perceived usefulness, perceived ease of use, and self-efficacy have a positive and meaningful effect on the intention to use IB services.

II. Theoretical Framework

TRA and TPB are two well-known models which are used to describe and predict the attitude of individuals accurately in various fields [15]. TAM is inherited from TRA in understanding the acceptance of information technologies [16]. It was proposed that an application or service can be adopted by people primarily because of the functions it performs, and secondarily of the ease related with making the system performs these functions [16]. Perceived usefulness and perceived ease of use are two fundamental determinants of system use.

The research constructs were determined based on TAM and incorporated two additional elements: trust and self-efficacy. The framework is grounded in four core principles, (i) perceived usefulness, (ii) perceived ease of use, (iii) trust, (iv) self-efficacy. Each measure's effect on the intention to use of IB was tested by analyzing the correlations.

The conceptualization and understanding of trust varies with disciplines, such economist defines it as an economic choice mechanism, physiologists see it as a personal trait, and sociologists consider it as a social parameter [19]. The trust of the customer in IB context is very important and it has a crucial role in spreading this service [20]. Banks should develop effective solutions and strategies in order to improve the trust of customers to online transactions [21]. Gefen (2003) concluded that trust positively influences the intentional use of internet shopping [22]. Also Suh and Han (2002) proposed that trust is the most significant variable in the adoption of IB, and individuals' intention to use is highly correlated with the attitude, perceived ease of use, and trust [23].

Self-efficacy was introduced to the IT literature in 1977. It is the belief of individuals to complete a task successfully under specific circumstances [24]. There are four main elements of self-efficacy, (i) performance, (ii) experience, (iii) persuasion, and finally (iv) emotion. Chan and Lu (2004) proposed that people with higher self-efficacy feel the use of IB easier; it has a significant effect on the continuity of use and acceptance of any new system [9].

III. Research Design

This study is targeting to identify the influential factors on IB adoption by Turkish electronic consumers. TAM was used as the base model with additional external variables. Figure 1 below shows the modified TAM model with the inclusion of trust and self-efficacy.
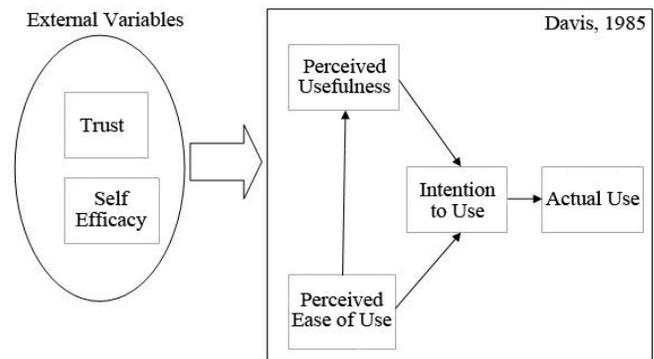

Figure 1. The adoption model used in this study.

Perceived usefulness is an individual's subjective assessment of performance. It is also defined as people's belief in which adoption of a particular system would enhance their performance in specific job [16]. Perceived ease of use is an individual's belief in which adoption of a particular system would be free of effort and difficulty [16]. Trust plays a direct and important role on satisfaction of IB users. Trusting to a system leads consumers to accept suggestion, information or services with less concern.

Hypotheses were constructed and tested for each of the four variables of the analysis based on the modified model. The more likely the users will be to adopt IB, the easier they think it is to use. Therefore the first hypothesis is for testing the relationship between perceived ease of use and the adoption of IB. It would be very convenient to use IB services for financial and non-financial transactions for the customers without time and location restrictions. The second hypothesis is testing the relationship with the perceived usefulness and the adoption of the system. The third and fourth hypotheses are to test the effect of trust and self-efficacy on the adoption of IB respectively.

H1. Perceived ease of use has a positive effect on users' intentions towards internet banking use.

H2. Perceived usefulness has a positive effect on users' intentions towards internet banking use.

H3. Trust has a positive effect on users' intentions towards internet banking use.

H4. Self-efficacy has a positive effect on users' intentional towards internet banking use.

Additionally the inner relationships between all variables were investigated and presented in the results part.

IV. Research Methods

People often hesitate to share personal information with the others, especially in banking industry. Direct contact with the third person may result some deficient information. An online survey, consisting twenty-one items was prepared in order to achieve the goal of the study. Items associated with each variable were determined by a detailed literature review. The demographic information of each subject was collected

including gender, age, the duration of computer, and internet use. 469 meaningful data sets were gathered. The survey was reachable for twenty days.

The participants were selected from IB users in Istanbul. 238 (50.7%) female and 231 (49.3%) male subjects attended the experiment. Considering the age, it is ranged from 21 to 54. The majority of the participants are between the ages of 25 – 30 (39%) and 31 – 35 (33.9%). 18.9% are aged over 35. All subjects have been using the internet and computers for at least 5 years. 402 subjects (85.7%) have computer experience over 10 years, and 322 subjects (68.7%) have been also using the internet over 10 years. 27% of the participants declared that they are also currently using mobile banking services.

Five points scale was used in the survey. The collected data was transferred to a software package which is commonly used for statistical calculations in Windows environment. Descriptive statistics, reliability by Cronbach's alpha, and Spearman's correlation were used to test the given hypotheses.

v. **Results**

The measures that we included to this study are perceived usefulness (4-items), perceived ease of use (4-items), IB intention to use (4-items), trust (4-items), and self-efficacy (4-items). The estimated reliability; α coefficients for the factors were .94, .89, .92, .91, and .64 respectively. The estimated reliability, α coefficient for the whole questionnaire was .94. Compared to the acceptance level of .60 for empirical research, the obtained scale reliabilities were relatively high, and indicated that the items for each scale were internally consistent and reliable.

The distribution and homogeneity of the data were evaluated by Kolmogorov Smirnov (Samples K-S) test. The collected data was not normally distributed. Histograms were generated to see how the data was distributed. A nonparametric test was required to apply for analysis. Therefore, Spearman's correlations were used to evaluate the relationships between the variables and test the assumptions.

TABLE1. KOLMOGOROV SMIRNOV (SAMPLES K-S) TEST

		PU	PEU	USE	TRU	SEF
N		469	469	469	469	469
Normal Parameters (a,b)	Mean	4.6199	4.191	4.568	3.583	4.396
	STD	.6456	.6646	.6282	.8432	.675
Most Extreme Differences	Absolute	.315	.165	.246	0,137	.230
	Positive	.278	.112	.246	0,119	.186
	Negative	-.315	-.165	-.231	-.137	-.230
Kolmogorov-Smirnov Z		6.816	3.566	5.332	2.967	4.983
Asymp. Sig. (2-tailed)		.000	.000	.000	.000	.000

a. Test distribution is Normal.

b. Calculated from data.

The mean values and standard deviations are 4.61 and .64 for perceived usefulness (PU); 4.19 and .66 for perceived ease of use (PEU); 4.56 and .62 for intention to use (USE); 3.58 and .84 for trust (TRU); 4.39 and .67 for self-efficacy (SEF).

Sampling was done by the IB users who are familiar with the computer systems. This might be the primary reason of relatively high mean values for each variable. Table 2 shows mean values and standard deviations for the collected data of all variables.

A Spearman's coefficient was run to determine the relationship between intention to use IB and perceived ease of use. There was a strong positive monotonic correlation between those variables (r_s = .596, p < .001). This indicates that perceived ease of use has a positive effect on users' intentions towards IB use. We can confirm that ease of use is a critical factor in the development and delivery of IB services. Simply, H1 is accepted.

The Spearman's coefficient indicating the association between perceived usefulness and intention to use is .732, p < .001. This indicates a positive and strong relationship between usefulness and the IB adoption. So, H2 is accepted too.

TABLE 2. DESCRIPTIVE STATISTICS FOR FACTORS

Factors	Sample Size	Mod	Mean	Standard Deviation
PU	469	5	4.61	.64
PEU	469	4	4.19	.66
USE	469	5	4.56	.62
TRU	469	4	3.58	.84
SEF	469	5	4.39	.67

The correlation between trust and intention to use IB is relatively weaker but significant. The Spearman's coefficient is 0.364, p < .001. Thus, H3 is accepted as well.

The results indicate that IB adoption has a positive and significant relationship with the self-efficacy (Spearman's ρ coefficient is .656, p < .001). We can therefore confirm that self-efficacy is a critical factor in the development and delivery of IB services. Therefore, H4 is accepted.

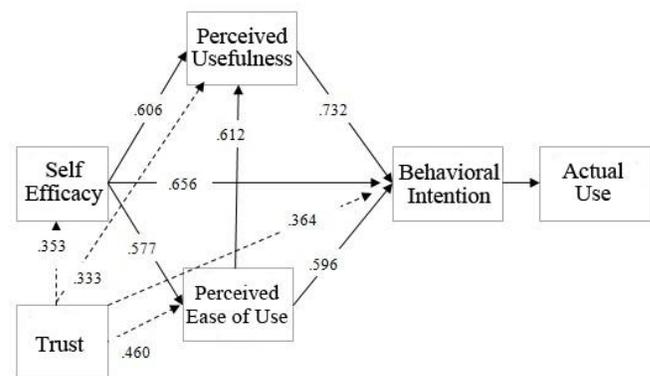Figure 2 below shows the inner relationships between all factors.

Figure 2. Correlation between factors.

Additionally, the correlation between perceived ease of use and perceived usefulness (Spearman's ρ coefficient is .612, p < .001); self-efficacy and perceived ease of use (Spearman's ρ coefficient is .577, p < .001); self-efficacy and perceived usefulness (Spearman's ρ coefficient is .606, p < .001); trust and perceived ease of use (Spearman's ρ coefficient is 0.460, p

< .001); trust and perceived usefulness (Spearman's ρ coefficient is .333, p < .001); trust and self-efficacy (Spearman's ρ coefficient is .353, p < .001); trust and were all significant. Some of the proposed relationships showed weaker correlations but all were significant.

VI. **Discussions**

The demands and expectations of the customers are increased for the services of financial operations. Customer transactions can be delivered on-line at reduced cost, easier, and more reliable with an increased satisfaction. Financial institutes can also reduce the cost and time of operations and administrations.

The results of this research have contributions for both practice and theory. The model that we designed represents significant improvements for TAM by including two more constructs as trust and self-efficacy. The results show that intention to adopt IB in Turkey can be predicted by attitude including perceived ease of use, perceived usefulness, and trust, and behavior such as self-efficacy.

The empirical results prove that trust and self-efficacy have positive and strong influence on the adoption of IB. The findings are beneficial for the management in resource allocation processes, and proposing up-to-date marketing strategies. The advantages of IB should be highlighted and advertised by comparing it with the traditional banking activities in Turkey. Electronic consumers should be assured that their private information and operated transactions will be kept safely. The use of a secure delivery channel from the personal computers to the bank server and starting sessions with key encryption are two significant issues that the users should be aware.

In order to improve the self-efficacy of the clients, the user-friendliness of the system should be explained careful by using multimedia tools. Even in branch, while they are performing tasks by traditional methods, they should be informed about how easy, time and effort saving, and advantageous IB is. The familiarity through IB should be assured in supporting the users to the adoption.

VII. **Conclusion**

IT adoption is one of the most studied fields in the literature. This research has also focused on the nature of IB and identifying the factors influencing the adoption of it in Turkey. The findings of this empirical study support theoretical model based on TAM and the external constructs, trust and self-efficacy. All suggested hypothesis were accepted with strong associations except trust had weaker relationship. The variables in our comprehensive model showed correlations between each other.

It was determined that especially the perceived usefulness, perceived ease of use, and self-efficacy have a positive and strong influence on the intention to IB use. Customers can be encouraged with new solutions and the identified factors can be used as a guideline to improve the efficiency and effectiveness of IB both for organizations and individuals.

This study contributes the literature by validating TAM to predict IB adoption, and the findings would benefit designing innovative marketing and management banking strategies.

While our study adds implications to practice and theory, we also acknowledge the limitations. We primarily concerned on the sampling, such the majority of the respondents are younger, and familiar with internet related applications. They were all active IB users. Naturally, they are more familiar with new technologies. The model can be tested on the elderly or less educated people as well. Also the number of factors included in our model is limited.

As a further study, the influence of some other factors such as risk, social influence, facilitating conditions, and effort expectancy can be added to our model. A cross-cultural research with the similar research questions in internet/mobile banking context might be conducted.

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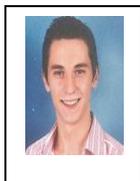
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