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Studying the Effect of Perceived Security on Brand Equity

Elika Amirasl[1]*, Majid Mohamadipour[2]

[1]Islamic Azad University Science and Research branch, Faculty of Economic and management, Management department, Tehran, Iran.
[2]Islamic Azad University Babol branch, faculty of Human Sciences, Business Management department, Babol, Iran.

***Corresponding Author**

Abstract: *The purpose of this study is "Studying the effect of perceived security on brand equity". The method used in this study from the point of purpose is applied research and from the point of matter is survey-descriptive research. The statistics population of this research was the students of Islamic Azad University Science and Research branch and Tehran Central branch. The number of 700 people is selected as a sample. The questions regard to the objectives of the study have been designed in Likert seven option package. For data analyzing Spss22 software in two parts, descriptive and inferential statistics and to check normality of the distribution, and the hypotheses AMOS22 software is used. Based on the results obtained from the research, all of the research hypotheses are confirmed with confidence level of 95%. The results indicate that the perceived security formed through interaction with an online banking service positively affects customer trust and satisfaction, which in turn influence loyalty and brand equity.*

Keywords: *Perceived Security, Online Banking, Trust, Satisfaction, Loyalty, Brand Equity.*

INTRODUCTION

Online banking has changed the way banks communicate with their customers (Salimon, Yusoff, & Mokhtar, 2017). Therefore, online banking has been known as an indispensable banking tool. E-service providers pay more attentions to the interactions between their customers and their services because customers do not have face-to-face interactions with the employees while they are using electronic services (Kao & Lin, 2015). Customers expect to be facilitated through provision of “anytime and anywhere service” from e-banking (Montazemi & Qahri-Saremi, 2015; Salimon, Yusoff, & Mokhtar, 2017). In this competitive world, customer’s loyalty is becoming a necessity to gain the competitive advantages for banking sector. Models of satisfaction-loyalty chains which have been presented by the previous studies, often have trouble incorporating the many satisfied consumers who eventually change the company which gives them services. It can be considered that a simple direct causal or path relationship between satisfaction and loyalty may not be sufficient and that important elements might be omitted in this simple relationship. Obviously, trust is considered important in online environments and e-banking service as the result of the related risks in such contexts, therefore it is added to this chain (Al-Debei, Akroush, & Ashouri, 2015; Gallarza, Gil Saura, & Arteaga Moreno, 2013; Kao & Lin, 2015). E-commerce security has been defined as a kind of threat that creates the ‘circumstance, condition, or event with the potential to cause economic hardship to data or network resources in the form of

destruction, disclosure, modification of data, fraud, and abuse (Salimon, Yusoff, & Mokhtar, 2017; Nasri & Charfeddine, 2012). Online services are riskier than physical product as the result of high levels of uncertainties that are associated with them. The absence of personal interaction with the service provider is making many customers be skeptical especially when they suspect that there would not be remedy if their information is compromised or funds stolen (Salimon, Yusoff, & Mokhtar, 2017). The results of some studies indicate that, security is one of the most effective factors in customers' satisfaction among other variables and it has direct impact on customers' satisfaction in e-banking (Kumbhar, 2011; Chen & Chang, 2009). Expectations about the future behavior of a person based on previous interactions could be shaped by trust. Trust has been examined in many disciplines, including social psychology, e-commerce, and e-banking and trust is particularly influenced by the security perceived by consumers regarding the handling of their private data (Roca, García, & Vega, 2008). Building a strong brand, which provides a lot of benefits to a firm, including less vulnerability in the competitive markets, larger margins, greater intermediary co-operation and support and brand extension opportunities, has become the goal of many organizations (Delgado-Ballester & Luis Munuera-Alemán, 2005)..Besides, many customers have abandoned online banking due to absence of security (Salimon, Yusoff, & Mokhtar, 2017). Moreover, from the human-computer interaction perspectives, there is also a lack of empirical studies, analyzing the effect perceived security on brand equity (Chen & Chang, 2009; Roca, García, & Vega, 2008).

The remainder of the paper is organized as follows. Section 2 discusses the literature review the conceptual framework, and establishes the hypotheses. Section 3 discusses research methodology while section 4 describes the data and analyzes the results. Section 5 is about discussions implications and concludes the paper.

Literature review, hypotheses development and conceptual framework

The relationship between perceived security, trust and satisfaction

Since financial and personal information of individuals might be misused in fraudulent purposes during e-services process, security should be considered more serious in e-service than in traditional services. Customers need the feeling of being secure while doing financial transactions that is why security is still considered as one of the most important factors in electronic service quality (Roca, García, & Vega, 2008). Chen et al. argued that in e-commerce, consideration of security refers to customer perceptions of the transaction security as a whole (Chen & Chang, 2009). Perceived Web security is defined as the extent to which a customer believes that the e-commerce website is secure for transmitting sensitive information (Salisbury, Pearson, Pearson, & Miller, 2001).It means their information will not be viewed, stored, and manipulated during transit and storage by unreliable parties (Flavia´n & Guinalı´u, 2006). The relationship among perceived security, trust and satisfaction in e-commerce services has been investigated in some studies (Chellappa & Pavlou, 2002; Chen & Chang, 2009; Roca, García, & Vega, 2008; Cheung & Lee, 2006; (Chen & Barnes, 2007). It is stated that the biggest challenge in the e-banking sector is to build customer trust based on security and privacy (Nasri & Charfeddine, 2012). Risks would be created by threats to information security in e-commerce transactions. Therefore, when customers feel less risk they can trust the service more and their trust increases (Chellappa & Pavlou, 2002). On the other hand, customer beliefs toward security have positive effect on their intentions to repurchase a product or reuse a service. It has been shown by previous studies that perceived security is a significant contributor to customer satisfaction (Chen & Chang, 2009; Liao & Cheung, 2008). In keeping with the above arguments, it is reasonable to hypothesize that:

H1: Perceived security has a significant positive effect on customer trust.

H2: Perceived security has a significant positive influence on customer satisfaction.

The relationship between trust, satisfaction and loyalty

The marketplace's traditional marketing model is being shifted from product-centricity to a great focus on building long-lasting relationships with the consumers (Moriuchi & Takahashi, 2016). In Chen et al. research, customer loyalty is defined as "a customer's favorable attitude toward an e-commerce website that predisposes the customer to repeat buying behavior" (Chen & Chang, 2009). As a result of the Internet widespread usage in services, different ways through which companies can improve website loyalty and increase the consumer's intention to buy a product or use a service online, have been investigated in several researches (Flavia´n & Guinalı´u, 2006; Belanche, Casalo, & Guinalı´u, 2012). Ribbink et al. proposed trust as a major driver of loyalty, and pointed out that it is really important for building and maintaining long-term relationships (Ribbink, Riel, Liljander, & Streukens, 2004). Trust is an important factor in transactions because of the degree of uncertainty in a virtual environment. Since the perceived risk is high in online exchanges or transactions, users feel more vulnerable (Roca, García, & Vega, 2008; Ribbink, Riel, Liljander, & Streukens, 2004). Hence, building customer trust is essential for companies to increase customer loyalty when risk is high (Kao & Lin, 2015). Since the relationship between trust and loyalty in e-commerce has been confirmed in several studies (Kao & Lin, 2015; Ribbink, Riel, Liljander, & Streukens, 2004; Roca, García, & Vega, 2008), we posited that:

H3: Customer trust has a significant positive influence on loyalty

Customer satisfaction which is generally considered as an important antecedent of loyalty, is presumed by preference and favorable attitudes (Ribbink, Riel, Liljander, & Streukens, 2004). The relationship between satisfaction and loyalty has been studied in some researches, and the researches mentioned that customer loyalty is determined to a large extent by customer satisfaction (Kao & Lin, 2015; Chen & Chang, 2009; Ribbink, Riel, Liljander, & Streukens, 2004; Sivadas & Baker-Prewitt, 2000), and more importantly, they discover that the positive relationship between satisfaction and loyalty becomes even stronger in online services than offline ones (Kao & Lin, 2015). Based on the above definitions and relationships, we hypothesize that:

H4: Customer satisfaction has a significant positive influence on loyalty.

The relationship between loyalty and brand equity

Brand equity has been defined from two perspectives: consumer and financial perspectives. Most of the definitions are from customer perspective. Buil et al. defined that" from a consumer perspective, brand equity is based on the premise that the power of brands lies in the minds of consumers and from a financial perspective brand equity is considered as the monetary value of a brand to the firm" (Bui, Martı´nez, & de Chernatony, 2013). Kao et al. considered customer-based brand equity as "a set of perceptions, attitudes, knowledge, and behaviors on the part of consumers that results in increased utility and allows a brand to earn greater volume or greater margins than it could without the brand name" (Kao & Lin, 2015). According to Aaker model loyalty is the most important driver of brand equity (Tong & Hawley, 2009). Loyal consumers properly response to a brand. Thus, brand loyalty will contribute to growing brand equity. The relationship between loyalty and brand equity has been investigated in some studies (Kao & Lin, 2015; Bui, Martı´nez, & de Chernatony, 2013; Tong & Hawley, 2009). The Literature leads to the following hypothesis:

H5: Loyalty has a significant positive influence on brand equity.

Conceptual framework

Based upon the literature review and the cognition-affect-behavior (C-A-B) model, the clue of the relationships among our research constructs are provided (Kao & Lin, 2015; Chen & Chang, 2009; Sivadas & Baker-Prewitt, 2000). Based on the model of Su Wen and Hsin Hsin' s study, it is posited that customer perceptions of security formed through interaction with an e-commerce website positively affected customer

satisfaction and thus customer loyalty (Chen & Chang, 2009). Roca et al. identified that the security features of the web site along with shared values are the key antecedents of trust (Roca, García, & Vega, 2008).Without a doubt, this connection between trust and perceived security in personal data handling is plausible and worthy of examination in greater detail. Thus, we propose that perceived security is antecedent of trust developed due to the nature of the internet (Guinalı´u & Flavia´n, 2006). With the aim of testing whether this connections are widespread, five major constructs and their corresponding interrelationships are depicted in Fig. 1 as our research framework.

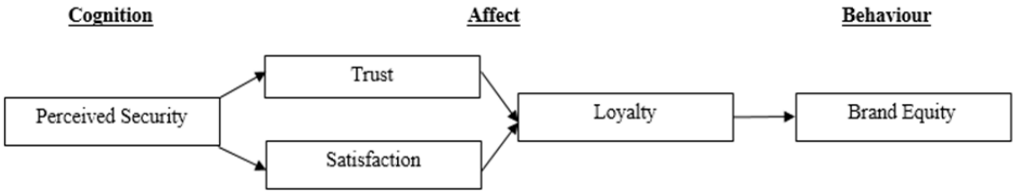

Figure 1. Conceptual framework (Chen & Chang, 2009; Roca, García, & Vega, 2008; Kao & Lin, 2015)

Research Methodology

Measurement

The measures used in this paper were mainly adapted from relevant prior studies. All items were measured using a seven-point Likert-type scale with anchors from 1 "strongly disagree" to 7 "strongly agree". Scales of perceived security were measured by the items derived from Chen et al., (2009), Roca et al., (2008) Shah et al., Nasri et al. (2013), Bressolles et al. (2014). Items for satisfaction were adapted from Kao et al. (2015), Shah et al. (2013) and Chen et al. (2009). Items for loyalty were adapted from Roca et al. (2008) and Kao et al. (2015), and the items for brand equity were adapted from prior work by Kao and Lin (Kao & Lin, 2015). First we pilot tested the questionnaire with a sample of 40. Reliability was examined using the Cronbach's α coefficient for the whole pilot test and each construct. Table 1 and 2 show Cronbach's α levels above 0.7, which demonstrates high construct reliability.

Table 1. Reliability for each construct

Construct	Symbol	No Of Questions	Cronbach's α coefficient
Perceived Security	PSSEC	7	0.881
Trust	TRU	7	0.796
Satisfaction	SAT	5	0.975
Loyalty	LOY	4	0.806
Brand Equity	BE	3	0.876

Table 2. Reliability for whole questionnaire

Whole questionnaire	Cronbach's α coefficient	No Of Questions
	0.878	26

Data collection

The sample consisted of 700 students in different levels of education at Science and Research and Center branches of Islamic Azad University in Tehran, who were internet banking users. The sampling method is based on structural equation method. According to this sampling method, for each unknown parameter, a

minimum of 10 and a maximum of 20 observations is required. The number of study factors based on hidden variables and relationships among variables is 31. In consultation with the supervisor, 700 people were selected as sample volume. The formal questionnaire was distributed among the university students. Table 3 presents sample characteristics measured in the survey. Among these respondents 55% are male and their ages range from 25 to 29 (32%). 37% of participants have more than two years of e-banking experiences and most of respondents are master's degree students (46%).

Table 3. Sample characteristics (N=700).

Variable		Percentage (%)
Gender	Male	55%
	Female	45%
Age	Under 20	4%
	21-24	22%
	25-29	32%
	30-34	24%
	35-39	12%
	Over 40	6%
Education	Bachelor's degree	42%
	Master's degree	46%
	PHD	10%
	Other	2%
Salary (Rials per month)	Under 10000000	20%
	10000000-20000000	37%
	20000000-30000000	34%
	Over 30000000	9%
The length of using e-banking services	Under 6 months	17%
	6 months-1 year	23%
	1 year-2 years	23%
	Over 2 years	37%

One of the main sections of the structural equation model (SEM) is to measure the model, because in this section the relationships between manifest and latent variables are being analyzed in order to judge the validity of the measured manifest variables. The evidence from the measurement section has supported the capabilities of the items in the measurement of the latent variables. The factor loadings of the items are positive and their values range from 0.727 to 0.928. In other words, the standard factor loadings of all items is larger than the required value of 0.4. The critical ratio (CR) calculated for the relationship between items with related structures is between 12.513 and 31.726, which in all cases is greater than 1.96 and 2.58. It shows the positive relationship between manifest and latent variables in questions. Table 4 contains standard factor loading estimates, critical ratio (CR) and coefficient of determination.

Table 4. Results of factor loading coefficient test of latent variables with manifest variables in research model.

Manifest variable	Latent variable	Standard Loading	CR	coefficient of determination
Security	PSEC1: The website has adequate security features.	0.872	-	0.760
	PSEC2: I am not worried about the security of an online bank.	0.850	30.748	0.723
	PSEC3: I have confidence that the site will not use my personal information for undesirable purposes.	0.871	32.268	0.759
		0.874	32.461	0.763
	PSEC4: I think my personal details are safe on this site.	0.863	31.684	0.745

	PSEC5: Using an online bank is financially secure. PSEC6: I would feel totally safe providing sensitive information about myself through this website. PSEC7: Overall, this website is a safe place to transmit sensitive information.	0.867 0.841	31.970 30.136	0.752 0.708
Trust	TRU1: Based on my experience with internet banking in the past, I know it is honest. TRU2: Based on my experience with internet banking in the past, I know the bank cares about customers. TRU3: Based on my experience with internet banking in the past, I know the bank is not opportunistic. TRU4: Based on my experience with internet banking in the past, I know the bank provides good service. TRU5: Based on my experience with internet banking in the past, I know it is predictable. TRU6: Based on my experience with internet banking in the past, I know it is trustworthy. TRU7: Based on my experience with internet banking in the past, I know it knows its market.	0.797 0.783 0.801 0.896 0.866 0.800 0.727	- 23.260 23.946 28.039 26.721 23.916 21.093	0.635 0.614 0.641 0.803 0.751 0.640 0.528
Satisfaction	SAT1: My choice to purchase from this website was a wise one. SAT2: I feel that the quality of service offered by Internet Banking is good. SAT3: In general I (am/was) happy with the service experience. SAT4: In general, I was pleased with the quality of the service that this internet bank provided. SAT5: I was satisfied with the service this internet bank provided.	0.876 0.864 0.854 0.847 0.828	- 31.426 30.714 30.233 28.989	0.767 0.746 0.729 0.717 0.686
Loyalty	LOY1: I will strongly recommend others to use this internet bank. LOY2: I consider myself to be loyal to this internet bank. LOY3: This internet bank would be my first choice. LOY4: I will not use other bank brands if this internet bank is available.	0.915 0.918 0.885 0.866	- 41.225 37.171 35.194	0.837 0.844 0.783 0.750
B.Equity	BE1: It makes sense to use this internet bank instead of any other brand, even if they are the same. BE2: Even if another brand has same features as this internet bank, I would prefer to use this internet bank. BE4: If another brand is not different from this internet bank in any way; it seems smarter to use this.	0.904 0.928 0.904	- 40.245 37.698	0.817 0.862 0.818

Analysis of the measurement model

We first developed the measurement model by conducting confirmatory factor analysis (CFA) and estimate the SEM for hypotheses testing.

Model fit indices results

The model was assessed by the maximum likelihood method using AMOS 22. To evaluate the fit of the model, a chi-square with degrees of freedom (CMIN/DF), goodness of fit index (GIF), normed fit index (NFI), incremental fit index (IFI), comparative fit index (CFI), parsimony normed fit index (PNFI), parsimony goodness of fit index (PGFI), root mean square error of approximation (RMSEA) and root mean square residuals (PMR) were employed. Table 5 contains good fit values and also the evaluated model fit values of the research are mentioned. As it is showed in the table 5 all indices satisfied the recommended values. Therefore, there was a reasonable overall fit between the model and the observed data.

Table 5: model fit values of the research

fit index	good fit values	evaluated model fit values
X2/df	Between 1.0 and 5.0	3.405
RMSEA	Value≤.08	0.059
NFI	Value>0.9	0.948
CFI	Value>0.9	0.962
PNFI	Value>0.5	0.857
PGFI	Value>0.5	0.751
GFI	Value>0.8	0.896
IFI	Value>0.9	0.962
PMR	Value<0.08	0.072

(Structural Equation Modelling, 2013)

Structural model results

There are two endogenous variables and three exogenous variables in the model. The critical ratios (CR) of each path between the variables are greater than 1.96 which indicates the significant positive influence relationship variables as follows:

In hypothesis H1, CR is 20.939 which proved that perceived security has a significant positive influence on customer trust. CR =23.820 in hypothesis H2 which indicates that V has a significant positive influence on customer satisfaction. The evaluated CR for hypothesis H3 is 12.513 which proves the significant positive effect of trust on customer loyalty. CR of hypothesis H4 is 14.226 which means satisfaction has a significant positive influence on customer loyalty. In hypothesis H5, CR is 31.726 which proved that customer loyalty has a significant positive influence on brand equity. Table 6 shows the structural model estimates, where the estimate parameters were standardized path coefficients, and all path coefficients were significant at the 95% level.

Table 6. The results of the structural equation model

	Hypothesized relationship			Estimate	Critical ratio	R^2	Conclusion
H1	Perceived Security	→	trust	0.797	20.939	0.653	Supported
H2	Perceived Security	→	Satisfaction	0.815	23.820	0.665	Supported
H3	trust	→	Loyalty	0.441	12.513	0.718	Supported
H4	Satisfaction	→	Loyalty	0.492	14.226		Supported
H5	Loyalty	→	Brand Equity	0.909	31.726	0.826	Supported

Discussions, conclusions and limitations

Discussions and implications

Since the relationships between perceived security and brand equity in the online banking sector, are examined in this study. Our study provided support for the research model and for the hypotheses regarding the linkages between the constructs. First, our study demonstrated that perceived security had a positive effect on customer trust and satisfaction, which indicated that banks should precise all the rules against cybercrime and internet fraud, and determine its responsibility about this crime. On the other hand, website security should be improved by the newest technology and some training about privacy and password management and different types of cybercrime. Second, trust and satisfaction positively affected loyalty. Banks ought to keep in touch with the customers using complaint services, conducting surveys to improve their services after e-banking usage process. Finally, it was demonstrated in our study that loyalty had a positive effect on brand equity. Based on the effective impact of loyalty on brand equity, banks marketing managers should conduct more researches about ways through which they can attract customer and keep

them as loyal ones in order to improve brand equity because not only can loyal customers attract more people to a special brand but also, they can improve brand equity by using all kinds of services of that brand.

Conclusions

Our study examined the influence of perceived security on brand equity, as well as the mediating roles of customer trust, satisfaction and loyalty based on the cognition–affect–behavior model. Our empirical results confirmed that perceived security positively affected customer trust and satisfaction. Satisfaction and trust consequently effected customer loyalty and customer loyalty effected brand equity.

Building brand equity in e-banking is really difficult. When it comes to e-banking customer perception of security becomes more significant. Hence, banks should care about the security as one of the main factors which can help them satisfy the customers and build trust. Based on satisfaction, trust and loyalty chain, satisfied customers who can trust the e-services are loyal to a special bank. All in all, banks should consider perceived security as one of the main factors which can help them improve brand equity.

Limitation

First, the statistics population of this research was the students of Islamic Azad University Science and Research branch and Tehran Central branch. According to the statistics population, customers who use Internet banking services and are not students are not included in this population. Therefore our sample does not represent the general online e-banking population.

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