APPLYING THE THEORY OF INNOVATION RESISTANCE TO UNDERSTAND WHY CUSTOMERS RESIST TO ADOPT ELECTRONIC BILLS ─ THE MODERATING EFFECTS OF PREMIUM, SELF-EFFICACY, AND ENVIRONMENTAL CONSCIOUSNESS

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ABSTRACT

Given the promise electronic bill presentment and payment offers, the expectations were that this technology should receive widespread acceptance. Nevertheless, the statistics show that electronic bills have not found favor with Taiwanese, a sign that past research embraced with the perspective of positive thinking has not been instructive to the popularity of innovative products, at least ineffective for the promotion of electronic bills. Drawing on the theory of innovation resistance along with the moderating effects of premium, self-efficacy, and environmenal consciousness, this study uncovers underlying relationship among relevant factors in order to improve current unsatisfied achievement in propagating electronic bills.

INTRODUCTION

Although the research based on the theory of innovation resistance abounds ([5][6][7][10]), most of which focus on the direct effect of adoption barriers on resistance behaviors, few has taken moderating variables into account.

In our daily life, people would resist innovation to a smaller degree once they have confidence to face them. For example, computer engineers with more computer knowledge than average users will be less unlikely to refuse having a shot at new software while the public would lower down their faith in use due to unfamiliarity, which explains the basic concept of self-efficacy. [11] contended that salespersons with high self-efficacy would be more confident to achieve better personal performance while carrying out an innovative system. In other words, the degree in which they resist innovation would be slight

because they assure that the ability of their own is able to fully eliminate negative perceptions and doubts brought by the innovation. [2] pointed out that innovation resistance is a subjective concept , including three dimensions of cognition, emotion, and behavior. They advocated that high perceived self-efficacy can reduce the degree of innovation resistance.

In addition, people with high environmental sense would have low resistance because they believe that the persistence to environmental protection is sufficient to weed out possible negative effects. Furthermore, premium is usually a measure to reduce resistance while consumers face innovative merchanise. [3] also considered that consumer behaviors would be affected by message collected before consumption, and one of such message is something about premium. Thus, it is possible to level down people's doubts regarding innovation if firms offer attractive premiums along with innovation.

Based on the above statement, this research extends the Theory of Innovation Resistance proposed by [9] to take self-efficacy, environmental consciousness, and premium as moderators into account in order to examine if users' resistance behaviors caused by functional and psychological barriers from adopting innovative products (ex: e-billing) differ depending on perceived self-efficacy, environmental consciousness, and premium.

METHODOLOGY

From a thorough review of the related literature, this research proposes the following framework:

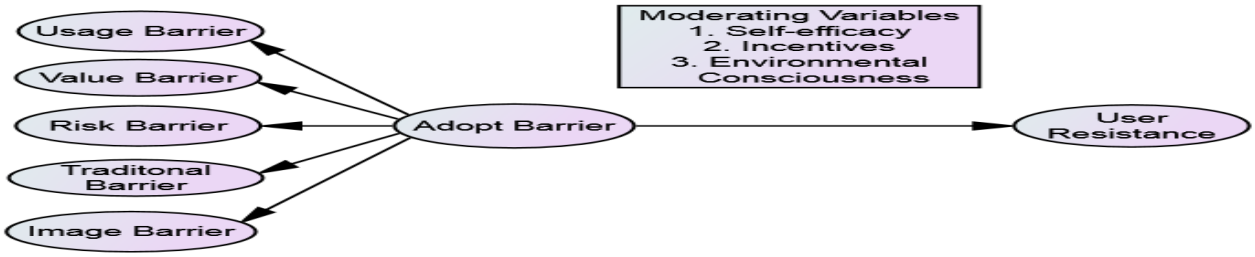

Fig. Research framework

Consequently, the following hypotheses were posited:

H1: The higher the adoption barriers perceived by the users of electronic bills are, the higher the resistance.

H2: Self-efficacy will moderate the positive relationship between the adoption barriers and users' resistance. That is, the relationship for users with low self-efficacy is stronger than that for those with high self-efficacy.

H3: Premium will moderate the positive relationship between the adoption barriers and users' resistance. That is, the relationship for low levels of premium is stronger than that for high levels of premium.

H4: Environmental consciousness will moderate the positive relationship between the adoption barriers and users' resistance. That is, the relationship for users with low environmental consciousness is stronger than that for high environmental consciousness.

The survey instrument was designed in the form of an on-line questionnaire and put on Mysurvey (http://www.mysurvey.tw). Then the website address of the questionnaire was posted in the Q_ary board of PTT, a quite welcomed Bulletin Board System among youngsters in Taiwan, to appeal to qualified netusers to participate. In addition, Mysurvey provides researchers with IP address-check functions to avoid double-logging its questionnaire website. In addition, paper questionnaires were distributed in the metro Taipei area in the form of convenience sampling. By items reversed, arbitrary questionnaires would be eliminated as well. The distribution of questionnaires was conducted from March 31 to the April 30, 2014, with approximately one month to collect the required data.

DATA ANALYSIS AND RESULTS

A total of 298 questionnaires were returned in a one-month period of data collection, and 36 surveys were unusable due to incomplete responses. The valid questionnaires were 262, including 110 ones from Mysurvey and 152 ones from paper, and the percent of valid response rate of questionnaires was 87.92%.

According to the collected sample, females (n = 156) outnumbered males (n = 106) by 19%. Most of the respondents centered on the age range of 20-24 (53.8%). In occupation, students are the majority (85.9%), people in the banking industry next. Those who own more than college diplomas are 75.6% of the sample. Finally, 50.8% of respondents have experience of under one year in electronic bills.

A confirmatory factor analysis using AMOS 21 was conducted to test the measurement model. Six common model-fit measures were used to assess the model's overall goodness of fit: the ratio of χ 2 to degrees-of-freedom (CMIN/DF), goodness-of-fit index (GFI), incremental fit index (IFI), Tucker-Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). As shown in Table 1, all the model-fit indices exceeded their respective acceptance levels recommended by [4] and [8], thus demonstrating that the measurement model exhibited a fairly good fit with the data collected. Therefore, this study could proceed to evaluate the psychometric properties of the measurement model in terms of reliability as well as convergent and discriminant validity.

Table 1

Model-fit Indices	Threshold Value	Measurement Model	Structural Model	Results
CMIN/DF	<3	1.518	1.433	good
GFI	>0.9	0.841	0.891	fair
IFI	>0.9	0.959	0.979	good
TLI	>0.8	0.959	0.979	good
CFI	>0.9	0.959	0.979	good
RMSEA	<0.08	0.045	0.041	good

Reliability and convergent validity of the factors were estimated by composite reliability and average variance extracted (AVE) (see Table 2). Composite reliability for all the factors in the measurement model is above 0.8, exceeding the acceptance level of 0.7 suggested by [1]. As can be seen from Table 2,

all the factor loadings are more than 0.7 and are statistically significant (t-value>1.96, p<0.05). The average extracted variances are all above the recommended 0.5 level ([4]), which means that more than half of the variances observed in the items are accounted for by their hypothesized factors. Therefore, all factors in the measurement model have adequate reliability and convergent validity.

Table 2

Dimension	Item	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Usage barrier	Use1	0.867	0.913	0.723
	Use2	0.884		
	Use3	0.843		
	Use4	0.805		
Value barrier	Value1	0.821	0.886	0.662
	Value2	0.847		
	Value3	0.858		
	Value4	0.721		
Risk barrier	Risk1	0.780	0.903	0.650
	Risk3	0.824		
	Risk4	0.808		
	Risk5	0.833		
	Risk6	0.786		
Traditional barrier	Trad1	0.851	0.912	0.676
	Trad2	0.846		
	Trad3	0.868		
	Trad4	0.792		
	Trad5	0.749		
Image barrier	Image1	0.872	0.899	0.691
	Image2	0.856		
	Image3	0.787		
	Image4	0.807		
Adoption barrier	usage	0.953	0.987	0.939
	value	0.976		
	risk	0.969		
	traditional	0.976		
	image	0.973		
Premium	Disc1	0.783	0.897	0.686
	Disc2	0.898		
	Disc3	0.816		
	Disc5	0.811		
Self-efficacy	Self2	0.823	0.890	0.670
	Self3	0.810		
	Self4	0.870		
	Self5	0.768		
Environmental consciousness	Green1	0.663	0.847	0.583
	Green2	0.868		
	Green3	0.758		

Dimension	Item	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
	Green4	0.752		
User resistance	Rej1	0.778	0.898	0.688
	Rej2	0.860		
	Rej3	0.849		
	Rej4	0.828		

The discriminant validity was tested by comparing the square root of AVE and its correlation coefficients with other factors for every construct. Table 3 shows that all square roots of the AVEs (listed in the diagonal) are larger than the correlation coefficients. Thus, the discriminant validity was established.

Table 3 The Square Roots of AVEs (Shown in Diagonal) and Correlation Coefficients

	Adoption barriers	User resistance	Environmental consciousness	Premium	Self-efficacy
Adoption barriers	**0.939**				
User resistance	0.637	**0.688**			
Environmental consciousness	0.010	0.050	**0.583**		
Premium	0.100	0.090	0.182	**0.686**	
Self-efficacy	0.130	0.100	0.176	0.330	**0.670**

AMOS 21 was adopted to estimate the structural model and test model hypotheses. The fit indices of the model are listed in Table 1. From path analysis, it can be found that adoption barrier does significantly affect user resistance (β =0.859, P<0.001). Thus, H_1 is supported. As for moderating effects, two structural models, constraint and unconstraint, were established to test if significant chi-square difference exists. The results showed that obvious difference existed between adoption barrier and user resistance only moderated by environmental consciousness ($\Delta\chi^2$=5.055>χ^2 (1,0.05)=3.841), but not for premium ($\Delta\chi^2$=0.814<χ^2 (1,0.05)=3.841) and self-efficacy ($\Delta\chi^2$=0.337<χ^2 (1,0.05)=3.841). Thus, H_4 is supported, but H_2 and H_3 is not supported.

DISCUSSIONS

According to the results, users' perceived barriers (usage barrier, value barrier, risk barrier, traditional barrier, image barrier) on electronic bills positively result in their resistance. Such consequences signal that the electronic bills service consumers encounter would be affected by previous experience in use, consumers would pay attention to the difference between adopting electronic bills and paper bills, and the relative advantage being substantial to entice consumers changing usage habits, etc. Firms have to do more efforts in functional and psychological perspectives for promoting electronic bills, and transform

consumers' traditional thought regarding electronic bills. Thus, two practical suggestions are provided: (1) taking advantage of the strategy of experience and word of mouth marketing to shorten the user's unfamiliarity towards electronic bills, and (2) reducing the positive impact between the adoption barriers and user resistance by means of upgrading users' environmental awareness. Finally, the future research may take the following directions into account: (1) variables that affect user's resistance (such as switching cost) should be discussed to have more extensive understanding, (2) some respondents' characteristics may affect on the results of path analysis of structural equation modeling, for example, gender, education, and level of electronic bills usage. These variables may consider as control variables to modify their effects, and (3) due to the limitation of time, cross-sectional data collection method was adopted. Thus, follow-up studies can collect longitudinal data to reverify the proposed model or find out whether there is any difference.

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