

Examining Consumers' Willingness to Buy in Chinese Online Market

Shouming Chen

School of Economics and Management, Tongji University, Shanghai, China

Email: schen@tongji.edu.cn

Jie Li

School of Economics and Management, Tongji University, Shanghai, China

Email: tjlie@gmail.com

Abstract—This paper aims to examine consumers' willingness to buy from an e-commerce vendor in Chinese online market by using empirical modeling. Initially, we hypothesize that six factors influence consumers' willingness to buy significantly. Then we develop 5 structural equation models (SEM) integrated these factors to test our hypotheses with the data from Chinese online market. The results suggest that perceived reputation and perceived risk are significantly associated with the level of consumers' willingness to buy, while perceived size, perceived system assurance, and perceived privacy information protection are insignificant related with the level of consumers' willingness to buy. In addition, perceived system assurance mediates the relationship between ease of use and willingness to buy.

Index Terms—e-commerce, SEM, willingness to buy

I. INTRODUCTION

In latest two decade, Internet as an information technology makes an egregious development and became indispensable in today's world. The prosperity of internet boosts the advent and development of Electronic Commerce, and continues to fascinate practitioners and enterprisers alike to invest. More and more companies engage their business online. On the other hand, the prosperity of e-commerce denotes that consumers have more and better choices when they purchase online than before. However, we are puzzled by a question, why consumers choose you when they have a number of choices. This question is a complex issue concerning consumer behavior in e-commerce. We focus the answer on the willingness to buy (WTB), which are directly associated with consumer purchase decision [1]. In this paper, we narrowed our research object on Chinese online market.

II. LITERATURE REVIEWS

Internet exerts an increasingly strong influence on society and people's life. It provides a new space for people to communicate, entertain, study and work and so on. Online shopping, as we called e-commerce usually, is another amazing utility of Internet. With the number of

Internet users growing, e-commerce would also expand. According to China Internet Network Information Center (CNNIC) 2007 report, in china alone, the number of internet user reached 210 million, 73 million more than the number in 2006 [2]. The CNNIC 2008 report shows that the number of internet user in China reached 253 million in June 2008 [3], and ranked as the top country that has the largest number of internet user in the world.

Further, the online market becomes more profitable and appealing when the internet user base is exploding. The growth of interest and market in the Internet as a shopping and purchasing medium is fascinating for practitioners and enterprisers alike. If you get online, you will find that Internet have been filling with B2B, C2C and B2C websites. The flourish of e-commerce engenders e-commerce venders' desires to understand and analyze the process of consumer purchase decision. When come to this topic, venders would like to ask a question, why consumers choose me when they have a lot of choices. We focus the answer on WTB, which are directly associated with consumer purchase decision [1].

According to the theory of reasoned action (TRA) model [1][4], an individual's performance in a specific behavior is determined by his or her behavioral intentions, which themselves are jointly determined by individual attitudes and subjective norms [1][5]. An extended model of TRA, namely the theory of planned behavior (TPB) was derived by adding perceived behavioral control as a determinant of behavior [6][7]. TRA and TPB have been empirically validated, and both models are widely used for predicting or explaining cognitive and affective behavior using the belief → attitude → intention → behavior relationship in social psychology. Hence, WTB from an online vender, the measurement of purchase intention, is effective and appropriate to predict and explain the consumer purchase decision or behavior.

However, there is few researches study the factors that directly influenced WTB. Many researchers study WTB by making the correlation between consumer trust and WTB [8][9][10]. These researchers focus on the issues of consumer trust, setting WTB as "by-product" of consumer trust.

Gefen focus the study on Amazon.com and found that increased degrees of trust in an e-commerce vendor will increase people's intentions to purchase products on that vendor's website [8]. Gefen and Straub demonstrate that four dimensions of trust, integrity, predictability, ability and benevolence, influence the level of intention to purchase [9]. Proposing model of consumer trust in e-commerce vendors for the US, Singapore and China groups, Teo and Liu found that the positive relationships exist between consumer trust and their attitude toward a vendor and between consumers' attitude and their willingness to buy from the vendor [10].

All of these studies use the similar reasoning approach: factors (influence on trust) \rightarrow consumer trust \rightarrow WTB. After analyzing the line of reasoning, we have to point out that the factors that influence consumer trust perhaps are not the same factors that influence WTB. It is probability that some factors that significantly influence consumer trust do not affect WTB at all. In addition, definitions of trust vary from one context to another. Tan and Sutherland find that the Oxford dictionary holds 17 definitions for the word trust, that the Webster's holds 18 definitions for the word trust, and that more than 12 different definitions have been used in consumer trust researches [11]. Different definitions require different factors that affected trust [12] [13] [14] [15] [16]. Hence, it is inappropriate for an e-commerce vendor to evaluate or to improve his customers' WTB by using the factors that affect consumer trust. Therefore, it is necessary and valuable to identify the factors that influenced WTB directly. These factors are more appropriate and valid to evaluate WTB than the factors that affect consumer trust are.

From previous consumer behavior researches, we could infer that some factors will affect consumers' willingness to buy from an e-commerce vendor. These factors include perceived reputation (PREP), perceived risk (PR), ease of use (EOU), perceived size (PS), perceived system assurance (PSA), and perceived privacy information protection (PPIP). However, few researches examine or document the significance of relationship between these factors and willingness to buy, let alone such examination in Chinese online market. China is acknowledged to be a fast growing economic entity and keep to exert an increased influence on global economy. Subsequently, Chinese business market, including Chinese online market, attracts attentions and investments from all over the world. It is undoubted that many individuals and organizations interest in the factors influencing consumers' willingness to buy that largely contributes the success of online business. Therefore, the purpose of this paper is to examine consumers' willingness to buy from an e-commerce vendor in Chinese online market.

III. CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

In order to examine consumers' willingness to buy in Chinese online market, a conceptual model was developed (shown in Fig. 1). The conceptual model shows the proposed hypotheses, the possible links

between variables: perceived reputation (PREP), perceived risk (PR), ease of use (EOU), perceived size (PS), perceived system assurance (PSA), and perceived privacy information protection (PPIP). The proposed links are hypothesized in the following.

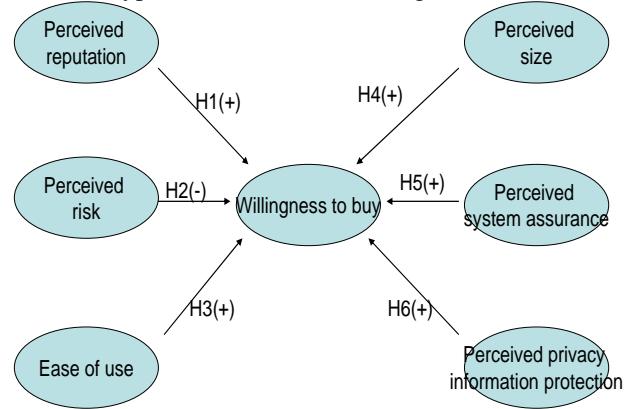


Figure 1. Conceptual model

A. Perceived reputation (PREP)

Reputation refers to the extent to which buyers believe a seller is professionally competent or honest and benevolent [12]. Researchers have recognized that a firm's reputation is a valuable intangible asset that requires a long-term investment of resources, efforts, and attention to customer relationships [10]. In the traditional marketing literature, reputation has been shown to be positively related to the buyer's positive judgment in the seller [17]. In Internet shopping, perceived reputation of a vendor has also been revealed to be significantly related to buyer's positive judgment, such as trust, in the vendor [18] [19] [20]. Jarvenpaa et al. asserted that customers' perceptions of an Internet store's reputation affect their trust in the store [20]. All of these researches show that reputation have a positive judgment of an e-commerce vendor. Therefore, we postulate that:

H1. The perceived reputation of an e-commerce vendor is positively related to the level of willingness to buy.

B. Perceived risk (PR)

Unlike consumers in the physical market, consumers may be dealing with remote vendors that they have never met and products that cannot be touched and felt. Hence, consumers tend to be reluctant to conduct businesses based only on the information provided by e-commerce vendors because such information may not be reliable. Bauer argues that once a risk has been perceived in a purchase situation, there seems to be some reasonable evidence that subsequent consumer behavior is shaped by this risk perception [21]. Perceived risk could also be regarded as a belief about situations. Mayer et al. defined risk perception as the trustor's belief about likelihoods of gains and losses outside of considerations that involve the relationships with the particular trustee [22]. Therefore, in accordance with TRA [1], consumer's perceived risk might have a negative relationship with their WTB. Ruyter et al. empirically verified that perceived risk has an impact on consumers' attitudes

toward e-service [23]. McKnight et al. stated that trusting intention is likely to be fragile if the perceived risk is high [24]. Consequently, we assume that:

H2. The perceived risk is negatively associated with the level of willingness to buy.

C. Ease of use (EOU)

Derived from the technology acceptance model (TAM) that introduced and developed by Fred Davis [25], ease of use in website was considered to be one of influence elements in our model. TAM is a model derived from a theory that addresses the issue of how users come to accept and use a technology. Perceived ease of use is one of the main variables, which are hypothesized to be fundamental determinants of user acceptance [26]. Davis and Arbor define perceived ease of use as the degree to which a person believes that using a particular technology will be free of effort [26]. Users believe that a given application is useful, but they may, at the same time, believe that the technology is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application [26]. Hence, we assume that:

H3. The ease of use in website is positively related to the level of willingness to buy.

D. Perceived size (PS)

Size refers to a seller's overall size and market share position [12]. Since a large market-share firm must serve a more diverse and heterogeneous set of customers [27], a large overall size and market share suggests that the firm consistently delivers on its promises to its consumers. Otherwise, it would not have been able to maintain its position in the industry [12]. Large organizational size also indicates that the firm is likely to possess expertise and necessary support systems that encourage trust and loyalty [28]. Larger firms also tend to have more well-developed Web sites to encourage transactions [29]. Finally, in an e-commerce environment, large size suggests that the vendor is able to assume the risk of product failure or transit losses and to compensate buyers accordingly [20]. All of these advantages brought by size make us to assume that:

H4. The perceived size of an e-commerce vendor is positively related to the level of willingness to buy.

E. Perceived system assurance (PSA)

System assurance is defined as the dependability and security of a vendor's online transaction system, which enables transactions through the Internet be secure and successful [10]. Consumers will perceive risks when they perceived that the web they interacting lack sufficient security of transaction system. Risks perceived reduce the level of WTB. Ambrose and Johnson found that insufficient trust in the security and reliability of the transactions over the Internet is a commonly expressed concern of consumers [30]. In addition, Kini and Choobineh argued that the assurance properties of the system that consumers interact with are critical in developing and maintaining consumer trust [31]. Teo and

Liu found that consumer trust is significantly related to WTB [10]. Hence, it follows that:

H5. Perceived system assurance is positively related to the level of willingness to buy.

F. Perceived privacy information protection (PPIP)

It is clear that consumer concern with privacy of information has an impact on the consumer online market. Conducted by Business Week in 1998, a poll of 999 consumers revealed that privacy was the biggest obstacle preventing them from using Websites [32]. Another study by Forrester Research shows that two-thirds of consumers are worried about protecting personal information online [33]. What is more, a survey conducted by Harris in 2001 documented that consumer concerns about protecting its privacy on the Internet, as individuals who have not bought over the Internet list security of information storage and transmission and the use of personal information as the top reasons why they have not purchased [34]. All of these statistics shows that fears of privacy violations affect consumer willingness to buy online. Therefore, we postulate that:

H6. Perceived privacy information protection is positively associated with the level of willingness to buy.

IV. METHOD

In this part, we are going to introduce our research method, including data collection and measurements.

A. Data collection

Students in TONGJI University were used as subject in our study. Drennan et al. argued that university students are representative of a dominant cohort of online users [35]. The college students are experienced and regular users of the Internet, representing the most appropriate population of e-commerce user for e-commerce research.

In the survey, items of variables were developed by adapting existing measures to the research context. All items were scored on a five point Likert-type scale ranging from (1) Strongly Disagree to (5) Strongly Agree.

The survey questionnaire consisted of two sections. In the first section, respondents were asked to answer questions about basic information, such as the gender, education level, and so on. On the end of first section, we ask them to choose one of the five webs (taobao, joyo, ebay, dangdang and paipai) or to fill any other web from which they have purchased goods before. The second section consists of the questions measuring model variables. Respondents answered the questions in second section based on the web that they chose in the end of the first section.

We give out 300 survey questionnaires in TONGJI University Library. All of 300 questionnaires have been taken back. We rule out the questionnaires that were conducted incompletely and eliminate the questionnaires with no online purchase experiences. We screen out 256 valid questionnaires as our research sample. The basic information of respondents is shown in Table I.

TABLE I.
BASIC INFORMATION OF RESPONDENTS

ITEMS	FEATURES	NUMBER	PERCENTAGE
GENDER	Male	180	70. 3%
	Female	76	29. 7%
EDUCATION LEVEL	Bachelor	160	62. 5%
	Master or MBA	83	32. 4%
	PhD and above	13	5. 1%
EXPENSE PER MONTH (yuan)	<1000	201	78. 5%
	1000-3000	50	19. 5%
	>3000	5	2. 0%
ONLINE PURCHASE EXPERIENCE (years)	<1	15	5. 9%
	1-2	113	44. 1%
	2-3	89	34. 8%
	>3	39	15. 2%
ANNUAL ONLINE PURCHASE TIME	1	53	20. 7%
	2-5	119	46. 5%
	5-10	50	19. 5%
	>10	34	13. 3%
THE WEBSITE CHOSEN BY RESPONDER TO ANSWER THE SURVEY	Taobao	155	60. 5%
	Joyo	44	17. 2%
	Dangdang	38	14. 8%
	Others	19	7. 4%

B. Measurements

In this part, we will introduce the measurements in our research. The measurements contain seven latent variables and twenty three observable indicators. Each latent variable is measured by at least three observable indicators. All of the variables, indicators, descriptions are listed in Table II.

In order to figure out the most valid descriptions for observable indicators in our questionnaire, all of the descriptions are tested and adjusted repeatedly to satisfy the requirements of reliability, validity and our research purpose. There are three types of description sources. The first type refers to the descriptions cited directly from previous researches, and we consider that they are already valid without adjusting. The second type refers to the descriptions cited from previous researches after adjusting. The third type refers to the new descriptions developed by ourselves with the reason that there are no related descriptions used before, such as the descriptions of PPIP. Although some descriptions are adjusted or new, all of them are derived from previous researches. Hence, we list the related references of the descriptions in Table II.

TABLE II.
MEASUREMENTS

Latent Variable	Observable Indicator	Descriptions	References
Willingness To Buy (WTB)	WTB1	I prefer to shop in this website.	Jarvenpaa et al. [20]; Jarvenpaa and Tractinsky [19].
	WTB2	I would return to purchase from this website again.	
	WTB3	I like shopping in this website.	
Perceived Reputation (PREP)	PREP1	This website has a good reputation.	Jarvenpaa et al. [20]; Teo and Liu [10].
	PREP2	This website has a reputation for honest.	
	PREP3	This website has a reputation for fair.	
Perceived Risk (PR)	PR1	There is great uncertainty associated with purchasing online from this website.	Houghton et al. [36]; Teo and Liu [10].
	PR2	There is great purchasing risk of this website.	
	PR3	The vendor in this website may cheat consumer.	
	PR4	The good purchased is not the same as expected.	
Ease Of Use (EOU)	EOU1	It is not hard to use this website efficiently.	Davis et al. [25]; Davis and Arbor [26].
	EOU2	It is convenient to find out the good I want to purchase.	
	EOU3	It is convenient to make a deal with the vendor in this website.	
Perceived Size (PS)	PS1	The size of this website is very large.	Jarvenpaa et al. [20]; Teo and Liu[10].
	PS2	This website is one of the biggest suppliers in industry.	
	PS3	This is a national or global website.	
Perceived System Assurance (PSA)	PSA1	The online transaction system of this website is stable.	Kini and Choobineh [31]; Teo and Liu [10].
	PSA2	It is safe to make a deal online from this website.	
	PSA3	This website has ability to accomplish online transaction successfully.	
Perceived Privacy Information Protection (PPIP)	PPIP1	This website will not give my privacy information away.	Branscum [33]; Harris [34].
	PPIP2	This website will not abuse my privacy information.	
	PPIP3	This website will protect my privacy information actively.	
	PPIP4	This website has ability to prevent my privacy information being stealing.	

V. RESULT

In this section, we use SPSS 13.0 to examine the reliability and validity and use LISREL 8.7 to conduct the Structural equation models.

A. Reliability

First, we focus on evaluating reliability. The Cronbach's alphas of willingness to buy (WTB), perceived reputation (PREP), perceived risk (PR), ease of use (EOU), perceived size (PS), perceived system assurance (PSA), and perceived privacy information protection (PPIP) are 0.851, 0.875, 0.732, 0.723, 0.806, 0.761, and 0.870, respectively. All of these Cronbach's alphas are >0.7. We conclude that all latent variables have adequate reliabilities.

B. models

According to the purpose of this paper, the latent variable, willingness to buy, is dependent variable, Y-variable, while the other six latent variables are independent variables, X-variables. After examining the

reliability, we translate the conceptual model shown in Fig. 1 into an overall structural equation model, model 1, which integrated all six independent variables. The result shows that some independent variables significantly associate with the dependent variables while other independent variables do not. However, we could not make conclusion imprudently from overall model because some insignificant independent variables are likely to influence the significance of the relationship between other independent variables and dependent variable. Therefore, in order to make a precise and suggestive result, we develop another four structural equation models to get rid of the possible influence between variables. Table III is a summery of the five models, including variables in each model, path coefficients, t-value and fix indices. Each X-variable contains two rows where the statistic number in the first row refers to its path coefficient and the statistic number bracketed in the second row refers to its t-value. The five structural equation models are demonstrated in the following.

TABLE III.
SUMMERY OF MODELS

Variables		MODELS				
		Model 1	Model 2	Model 3	Model 4	Model 5
Y-variable	Willingness to buy(WTB)	WTB	WTB	WTB	WTB	WTB
X-variable	Perceived reputation (PREP)	0.44* (4.99)	0.44* (5.42)	0.44* (4.97)	0.44* (5.38)	0.45* (5.45)
	Perceived risk (PR)	-0.20* (-2.82)	-0.20* (-2.94)	-0.20* (-2.90)	-0.20* (-2.92)	-0.20* (-2.86)
	Ease of use (EOU)	0.19 (1.61)	0.21* (2.38)	0.20* (2.12)	0.20 (1.70)	0.20* (2.14)
	Perceived size (PS)	0.01 (0.06)		0.01 (0.09)		
	Perceived system assurance (PSA)	0.01 (0.06)			0.01 (0.14)	
	Perceived privacy information protection (PPIP)	0.02 (0.25)				0.02 (0.36)
Fit indices	χ^2	419.32	109.25	166.68	186.69	229.87
	DF	209	59	94	94	109
	P-value	<0.001	<0.001	<0.001	<0.001	<0.001
	RMSEA	0.063	0.058	0.055	0.062	0.066
	CFI	0.96	0.97	0.97	0.97	0.98
	NFI	0.92	0.95	0.95	0.94	0.92
	NNFI	0.95	0.96	0.97	0.96	0.97
	GFI	0.87	0.94	0.92	0.92	0.90

Note: * means this coefficient is significant.

● Model 1

Model 1 is an overall structural equation model integrated all six independent variables (PREP, PR, EOU, PS, PSA and PPIP) to evaluate willingness to buy.

First, we test validity using PCA (Principle Component Analysis). The value of KMO is 0.828. The significance of Bartlett's Test is less than 0.001. KMO and Bartlett's Test indicates that all the factors are

suitable for PCA. We use Varimax Rotation method to rotate factors. The rotated component matrix is shown in Table IV.

TABLE IV.
ROTATED COMPONENT MATRIX OF MODEL 1

	WTB	PREP	PR	EOU	PS	PSA	PPIP
WTB1	0.837	0.137	-0.096	0.137	0.145	0.019	0.092
WTB2	0.825	0.302	-0.057	0.119	0.068	0.054	0.093
WTB3	0.789	0.120	-0.244	0.142	0.127	0.144	0.057
PREP1	0.295	0.793	-0.092	0.055	0.242	0.160	0.125
PREP2	0.320	0.747	-0.038	0.212	0.275	0.195	0.008
PREP3	0.114	0.773	-0.136	0.248	0.166	0.166	0.081
PR1	-0.107	-0.067	0.763	0.109	0.004	-0.004	-0.086
PR2	-0.086	0.105	0.738	-0.054	0.008	-0.281	-0.138
PR3	-0.008	-0.277	0.675	-0.051	-0.030	0.169	0.017
PR4	-0.142	-0.018	0.735	-0.186	0.005	-0.031	-0.017
EOU1	0.122	0.274	-0.034	0.756	0.038	0.119	0.060
EOU2	0.074	0.103	-0.058	0.636	0.387	0.135	0.151
EOU3	0.211	0.070	-0.089	0.750	0.123	0.184	0.162
PS1	0.047	0.159	0.104	0.110	0.824	0.034	0.118
PS2	0.160	0.190	0.025	0.133	0.817	0.216	0.038
PS3	0.127	0.149	-0.128	0.117	0.747	0.145	0.028
PSA1	0.132	0.197	-0.031	0.284	0.182	0.676	0.216
PSA2	0.209	0.070	0.083	0.321	0.248	0.648	0.266
PSA3	-0.014	0.206	-0.117	0.043	0.111	0.769	0.156
PPIP1	0.012	0.068	0.041	0.060	0.055	0.230	0.831
PPIP2	-0.002	0.036	-0.086	-0.078	0.130	0.230	0.859
PPIP3	0.140	-0.055	-0.204	0.260	0.068	0.063	0.730
PPIP4	0.125	0.145	-0.030	0.170	-0.012	0.008	0.859

The rotated component matrix indicates that all the indicator items loaded very high (above 0.636) on their respective factors and below 0.40 all the other factors, suggesting good convergent validity and discriminant validity for each latent variable. Then we use Lisrel 8.7 to conduct SEM. The path diagram is shown in Fig 2. The fit indices of model 1 shown in Table III indicate a good model fit. The standardized structural coefficients and t-value are shown in Table III. Generally, when the absolute value of $t > 2$, the coefficient is significant. Hence, the result of model 1 supports H1 and H2, but does not support H3, H4, H5 and H6.

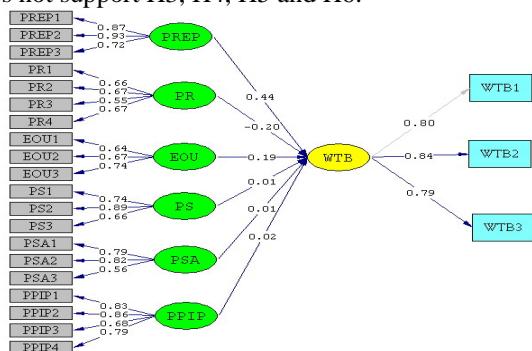


Figure 2. Path Diagram of Model 1

● Model 2

As we discussed before, model 1 did not rule out the possible influence between independent variables. Hence, we develop model 2 where three variables (PREP, PR and EOU) are integrated to evaluate WTB. First, we test validity using PCA (Principle Component Analysis). The value of KMO is 0.816. The significance of Bartlett's Test is less than 0.001. KMO and Bartlett's Test indicates that all the factors are suitable for PCA. We use Varimax Rotation method to rotate factors. The rotated component matrix is shown in Table V.

TABLE V.
ROTATED COMPONENT MATRIX OF MODEL 2

	WTB	PREP	PR	EOU
WTB1	0.846	0.178	-0.087	0.145
WTB2	0.823	0.319	-0.068	0.110
WTB3	0.804	0.141	-0.234	0.226
PREP1	0.289	0.851	-0.094	0.127
PREP2	0.307	0.815	-0.028	0.273
PREP3	0.104	0.803	-0.141	0.274
PR1	-0.098	-0.071	0.774	0.070
PR2	-0.086	0.051	0.754	-0.151
PR3	-0.024	-0.243	0.669	0.056
PR4	-0.141	-0.013	0.736	-0.181
EOU1	0.132	0.244	-0.026	0.733
EOU2	0.087	0.197	-0.044	0.751
EOU3	0.208	0.100	-0.098	0.801

The rotated component matrix indicates that all the indicator items loaded highly (above 0.669) on their respective factors and below 0.40 all the other factors, suggesting good convergent validity and discriminant validity for each latent variable. Then we use Lisrel 8.7 to conduct SEM. The path diagram is shown in Fig 3. The fit indices of model 2 shown in Table III indicate a good model fit. The standardized structural coefficients and t-value are shown in Table III. According to the t-value, the result of model 2 supports H1, H2 and H3.

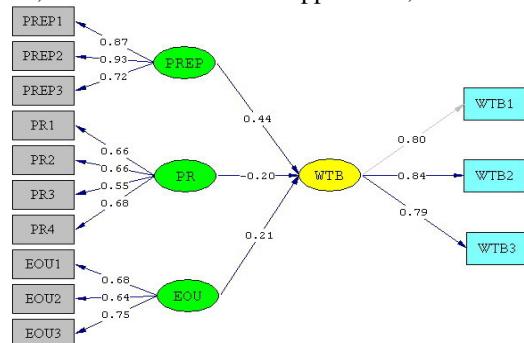


Figure 3. Path Diagram of Model 2

● Model 3

In model 3, we add model 2 with another X-variable, perceived size (PS), to evaluate WTB. The value of KMO is 0.831. The significance of Bartlett's Test is less than 0.001. KMO and Bartlett's Test indicates that all the

factors are suitable for PCA. We use Varimax Rotation to rotate factors. We use Varimax Rotation method to rotate factors. The rotated component matrix is shown in Table VI.

TABLE VI.
ROTATED COMPONENT MATRIX OF MODEL 3

	WTB	PREP	PR	EOU	PS
WTB1	0.843	0.150	-0.092	0.122	0.146
WTB2	0.822	0.324	-0.064	0.112	0.066
WTB3	0.800	0.114	-0.242	0.206	0.143
PREP1	0.289	0.809	-0.101	0.085	0.259
PREP2	0.305	0.774	-0.037	0.234	0.283
PREP3	0.107	0.789	-0.143	0.256	0.180
PR1	-0.104	-0.056	0.778	0.082	-0.009
PR2	-0.082	0.063	0.757	-0.136	-0.043
PR3	-0.016	-0.269	0.660	0.046	0.018
PR4	-0.141	-0.025	0.734	-0.187	0.016
EOU1	0.126	0.292	-0.017	0.766	0.029
EOU2	0.082	0.103	-0.066	0.665	0.398
EOU3	0.207	0.095	-0.100	0.792	0.141
PS1	0.050	0.168	0.099	0.089	0.830
PS2	0.153	0.222	0.017	0.153	0.828
PS3	0.134	0.152	-0.121	0.158	0.749

The rotated component matrix indicates that all the indicator items loaded very high (above 0.660) on their respective factors and below 0.40 all the other factors, suggesting good convergent validity and discriminant validity for each latent variable. Then we use Lisrel 8.7 to conduct SEM. The path diagram is shown in Fig 4. The fit indices of model 3 shown in Table III indicate a good model fit. The standardized structural coefficients and t-value are shown in Table III. According to the t-value, the result of model 3 supports H1, H2 and H3 but does not support H4.

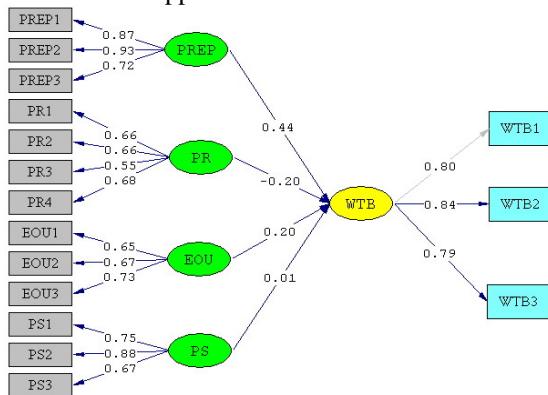


Figure 4. Path Diagram of Model 3

● Model 4

Model 4 was also developed from model 2 by adding another X-variable, perceived system assurance (PSA). The value of KMO is 0.822. The significance of Bartlett's Test is less than 0.001. KMO and Bartlett's Test indicates that all the factors are suitable for PCA. We use

Varimax Rotation to rotate factors. The rotated component matrix is shown in Table VII.

TABLE VII.
ROTATED COMPONENT MATRIX OF MODEL 4

	WTB	PREP	PR	EOU	PSA
WTB1	0.842	0.171	-0.088	0.146	0.067
WTB2	0.827	0.302	-0.061	0.128	0.070
WTB3	0.794	0.135	-0.241	0.176	0.139
PREP1	0.299	0.824	-0.084	0.089	0.212
PREP2	0.317	0.790	-0.020	0.240	0.200
PREP3	0.112	0.781	-0.133	0.258	0.193
PR1	-0.113	-0.061	0.770	0.104	-0.045
PR2	-0.090	0.097	0.743	-0.030	-0.320
PR3	-0.010	-0.284	0.674	-0.065	0.182
PR4	-0.139	-0.021	0.738	-0.212	0.013
EOU1	0.121	0.252	-0.036	0.752	0.083
EOU2	0.091	0.166	-0.043	0.701	0.241
EOU3	0.216	0.064	-0.094	0.766	0.222
PSA1	0.135	0.215	-0.035	0.287	0.734
PSA2	0.220	0.099	0.077	0.356	0.731
PSA3	-0.018	0.222	-0.120	0.057	0.761

The rotated component matrix indicates that all the indicator items loaded very high (above 0.674) on their respective factors and below 0.40 all the other factors, suggesting good convergent validity and discriminant validity for each latent variable. Then we use Lisrel 8.7 to conduct SEM. The path diagram is shown in Fig 5. The fit indices of model 4 shown in Table III indicate a good model fit. The standardized structural coefficients and t-value are shown in Table III. According to the t-value, the result of model 4 supports H1 and H2 but does not support H3 and H5.

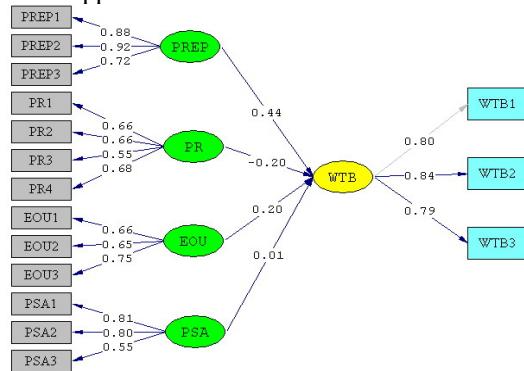


Figure 5. Path Diagram of Model 4

● Model 5

Model 5 was also developed from model 2 by adding another X-variable, perceived privacy information protection (PPIP). The value of KMO is 0.810. The significance of Bartlett's Test is less than 0.001. KMO and Bartlett's Test indicates that all the factors are suitable for PCA. We use Varimax Rotation to rotate factors. The rotated component matrix is shown in Table VIII.

TABLE VIII.
ROTATED COMPONENT MATRIX OF MODEL 5

	WTB	PREP	PR	EOU	PPIP
WTB1	0.848	0.163	-0.089	0.147	0.087
WTB2	0.821	0.313	-0.067	0.105	0.086
WTB3	0.797	0.155	-0.228	0.203	0.080
PREP1	0.284	0.849	-0.093	0.105	0.142
PREP2	0.309	0.813	-0.036	0.274	0.035
PREP3	0.104	0.798	-0.143	0.269	0.092
PR1	-0.093	-0.078	0.763	0.099	-0.088
PR2	-0.080	0.063	0.745	-0.117	-0.189
PR3	-0.032	-0.225	0.681	0.012	0.066
PR4	-0.138	-0.016	0.737	-0.184	-0.015
EOU1	0.136	0.232	-0.033	0.752	0.056
EOU2	0.081	0.204	-0.035	0.721	0.165
EOU3	0.203	0.100	-0.088	0.778	0.176
PPIP1	0.016	0.095	0.044	0.105	0.859
PPIP2	0.004	0.087	-0.080	-0.019	0.895
PPIP3	0.152	-0.054	-0.205	0.262	0.722
PPIP4	0.124	0.119	-0.035	0.148	0.835

The rotated component matrix indicates that all the indicator items loaded very high (above 0.681) on their respective factors and below 0.40 all the other factors, suggesting good convergent validity and discriminant validity for each latent variable. Then we use Lisrel 8.7 to conduct SEM. The path diagram is shown in Fig 6. The fit indices of model 5 shown in Table III indicate a good model fit. The standardized structural coefficients and t-value are shown in Table III. According to the t-value, the result of model 5 supports H1, H2 and H3 but does not support H6.

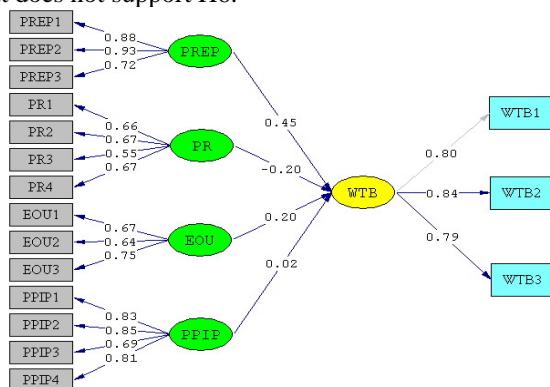


Figure 6. Path Diagram of Model 5

VI. DISCUSSION

This paper develops five structural equation models to demonstrate the hypotheses we proposed. The result supports some of them and denies the others.

H1 refers that the perceived reputation (PREP) of an e-commerce vendor is positively related to the level of willingness to buy (WTB). All of five models support H1. Accordingly, perceived reputation has a significantly positive relationship with WTB. This result is consistent with the findings of Teo and Liu [10] and Jarvenpaa et al.

[20]. Both researches show that perceived reputation affects WTB. In e-commerce world, this result also predicts that higher vendor's reputation improve consumers' willingness to buy from the vendor.

H2 refers that the perceived risk (PR) is negatively associated with the level of willingness to buy (WTB). All five models support this hypothesis. The result provides empirical evidence to TRA [1] (Ajzen and Fishbein, 1980). Hence, high perceived risk will reduce the consumers' willingness to buy.

H3 refers that the ease of use (EOU) in website is positively related to the level of willingness to buy (WTB). Model 1 and model 3 both involving perceived system assurance (PSA) variable do not support H3. The models that do not involve perceived system assurance (PSA), such as model 2, model 3 and model 5, show that EOU is significantly link with WTB. Hence, we find that PSA is a modulator in the relationship between EOU and WTB. Here, we try to give possible explanations. In accordance with TAM, EOU is an effective factor that affects WTB. People increase the willingness to buy when they perceived that the website is ease to use. But, if they consider ease of use and system assurance together, they realize that system assurance play a more important role than the ease of use in shopping. Therefore, PSA affect the significance of the relationship between EOU and WTB, as shown in model 1 and model 3.

H4 refers that the perceived size (PS) of an e-commerce vendor is positively related to the level of willingness to buy (WTB). Model 3 shows that H4 is insignificant. This result is consistent with the findings of Teo and Liu [10] and Jarvenpaa et al. [20]. One possible reason is that size of an online vendor is less easily perceived on the Web than size of a physical store. Unlike size of a vendor in physical world, size of a vendor in the online world cannot be easily and correctly judged through its website. Hence, consumers may not care much about the size of an ecommerce vendor.

H5 refers that perceived system assurance (PSA) is positively related to the level of willingness to buy (WTB). Model 4 shows that H5 is insignificant. However, Teo and Liu argue that PSA significantly affects consumers' trust and then affects willingness to buy [10]. In addition, we find that PSA affect the significance of the relationship between EOU and WTB when we discuss H3, it is possible that PSA is correlate with EOU. Therefore, we could not conclude hastily that the relationship between PSA and WTB is insignificant. Further researches are required if we get a more precise conclusion.

H6 refers that perceived privacy information protection (PPIP) is positively associated with the level of willingness to buy (WTB). Model 5 shows that H6 is insignificant. This result is not consistent with the findings of Green et al. [32] and Branscum [33]. Although foreign survey and study reveal that privacy is an element influence consumers' willingness to buy. Perhaps Chinese people do not perceive privacy as important as foreign people do. The reason for such

difference may derive from social and cultural background between two countries. We ask some respondents face to face that answer our questionnaire in TONGJI University Library. When come to privacy information protection, some of them feel that most e-commerce vendors will not protect customers' privacy information actively. They said that they care about privacy information protection, but it is impossible to prohibit their privacy information from being leaked. Accordingly, PPIP seems not to affect consumers' willingness to buy significantly. However, we would not suggest the conclusion that PPIP do not affect WTB. We need further researches to examine H6.

VII. CONCLUSION

This paper focuses on examining consumers' willingness to buy in Chinese online market. We review the previous literatures and pick out six variables, including perceived reputation, perceived risk, ease of use, perceived size, perceived system assurance, and perceived privacy information protection. Then we develop 5 models to test our hypotheses. The main conclusions from this paper are shown in the following. Perceived reputation of an e-commerce vendor is positively related to the level of willingness to buy. Perceived risk is negatively associated with the level of willingness to buy. However, perceived size, perceived system assurance, and perceived privacy information protection are insignificant related with the level of consumers' willingness to buy. Additionally, the relationship between ease of use and willingness to buy is mediated by perceived system assurance.

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Shouming Chen is an associate professor at School of Economics and Management, Tongji University. He received his Ph.D. in management from Fudan University in 2001. His research interests include strategic management and service management.

Jie Li was born in 1983. He received B.S degree from Tongji University in 2004. Currently, he is a graduate student at School of Economics and Management in Tongji University. He specializes in marketing management.