

Dimensions of Consumer's Perceived Risk in Online Shopping

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Abstract *Perceived risk is an important concept in consumer behavior in online shopping. It impedes the adopting online shopping. A structure model with seven factors of consumer's perceived risk in online shopping is developed in this paper. The results have the descriptive power about Chinese consumers' perceived risk in Internet shopping and provide framework for managerial use in China's e-commerce market environment.*

Key words *on-line shopping; consumer behavior; perceived risk*

The shopping through the Internet raises questions concerning customer intentions to online shopping. Web shopping involves a number of concerns of consumers, including trade fraud, product quality, monetary losses, privacy, information quality and so on. Those concerns may be the consequences of a failed purchase online. The purpose of this paper is to develop theoretically justifiable constructs for measuring Web-customer perception of risk in online shopping.

In contrast to traditional consumer behavior, on-line transactions have certain unique characteristics, such as the extensive use of technology for transactions, the distant and impersonal nature of the online market environment, and the implicit uncertainty of using open network infrastructures for transactions. More specifically, consumers must actively engage in interacting with the retailer's Web sites, the spatial and temporal separation between consumers and marketers increases fears of Web retailer opportunistic behavior arising from product and identity uncertainty, and there is concern about that third parties or hackers may threaten consumer's privacy and monetary information.

In this research we are going to explore and examine the consumer's perception of risk that impedes the adopting online shopping. We will conceptualize develop a structure model of the dimensions of consumer's perceived risk in online shopping by conducting surveys and data analysis. The

results can reveal the dimensions how Chinese consumers perceive the risks when they shop in Internet stores. The constructs from exploratory research may be used as measures of consumer's perceived risk.

1 Perceived Risk

When faced a buying situation, a consumer perceives a certain degree of risk involved in choice of a particular brand and how to buy it. Bauer first introduced the perceived risk concept to consumer behavior research in order to explain such phenomena as information seeking, brand loyalty, opinion leaders, reference groups and pre-purchase deliberations^[1]. Perceived risk is a fundamental concept in consumer behavior that implies that consumers experience pre-purchase uncertainty as to the type and degree of expected loss resulting from the purchase and use of a product.

Cunningham suggested that risk comprises two dimensions: uncertainty and consequences^[2]. Peter and Ryan have modified the original model slightly and in its simplest form can be represented as: $R=PL$, which represents the probability of bad consequences occurring and L represents the negative consequences of poor brand choice or loss^[3].

Conceptualized as the likelihood of negative consequences, perceived risk represents consumers' uncertainty about loss or gain in a particular transaction and it has six components: financial,

performance, social, psychological, safety, and time/convenience loss. Financial risk refers to the probability that a purchase results in loss of money or other resources. Performance risk refers to the probability that a product purchased results in failure to function as expected. Social risk refers to the probability that a product purchased results in disapproval by family or friends. Psychological risk refers to the probability that a product results in inconsistency with self-image. Physical risk refers to the probability that a product purchased results in personal injury and time risk refers to the probability that a purchase results in loss of time to buy or retain the product. Overall, perceived risk represents an aggregated impact of these various factors (Kaplan et al.)^[4].

2 Dimensions of Consumer's Perceived Risk in Online Shopping

Together with the existence of countless Internet vendors, the importance of perceived risk to B2C e-commerce further increases. Such a perception is likely to become a decisive factor in affecting consumers' behavior. This is because consumers perceive higher levels of risk toward B2C e-commerce when they consider security to be insufficient. E.H. Fram and D.B. Grady report that online customers are concerned with credit card fraud and are willing to purchase only products with low levels of purchasing risk^[5].

S.L. Jarvenpaa, P.A. Todd suggested there is a perceived personal risk. It is the possibility that individuals may be harmed because of their purchase behavior^[6]. For example, they are likely to suffer if their credit cards information is stolen; E.A. Nyshadham examined the perceived privacy risk that is the possibility that online businesses collect data about individuals and use them inappropriately^[7]. D.E. McCorkle shown the perceived source risk, which is the possibility, that individual suffers because the businesses from which they buy products are not trustworthy^[8]. It is a general perception regarding the reliability of vendors such as whether a company exists.

Engel and Blackwell found that the lack of opportunity to examine the products prior to purchase

and the difficulties in returning faulty merchandise are common reasons why consumers perceived mail shopping to be riskier than store shopping^[9]. Since Internet shopping is a high technology form of non-store shopping, it also shares some of the problematic features relating to telephone and mail order shopping. Hence, it is reasonable to expect that consumers will tend to perceive a higher level of risk when purchasing products through the Internet than by in-store means.

Nena Lim examined the concept of consumers' perceived risk toward B2C e-commerce^[10]. The results of focus group discussions confirm three sources of consumer's perceived risk: technology, vendor, and product. Sandra M Forsythe and Bo Shi examined four types of perceived risk that were of concern to Internet shoppers and browsers—financial, product performance, psychological, and time/convenience loss risk^[11].

Based on the literature studies, we have assumed the online-consumer's perceived risk have the following dimensions: e-Retailer source risk; Purchasing process risk; Time loss risk; Delivery risk; Financial risk; Product performance risk; Asymmetric information risk; Privacy risk.

The above listed dimensions are our basis for measuring consumer's perceived risk in online shopping.

3 Methodology

347 students of a university in western China participate this research. All respondents come from 26 provinces of China. 43.8% of them come from Sichuan provinces. The respondents' educational background covers undergraduate students, graduate students and MBA students. All MBA students and some of graduate students have working experiences. All of the respondents are experienced Internet users, and a few of them have the experience of Internet shopping, and the most of them have the positive attitude to shop through Internet in the future.

Based on the literature review, we developed a seven Likert-scale with 36 items questionnaire. Each item was on a scale of one to seven, with ratings from "least concerned" to "most concerned". The items were randomly ordered in a questionnaire instrument. The questionnaire included asking the information about

age, gender, and education background, experience of Internet use, experience of online shopping, and intentions to Internet shopping and where they come from, to get the demographic information.

We take many class times to ask the students to score the items in the questionnaire. The items represent the concerns of respondents may have in an online shopping. In order to keep a generalization, we gave a scenario in which we did not specify the good purchased, but we set a scenario of a purchase with the value over 100 RMB Yuan in an Internet store in order to make the online buying action relatively important.

After conducting the survey, the data was collected, coded and examined. We finally obtained 336 effective questionnaires as our analyzing cases. Then, we use SPSS 11.5 to conduct exploratory factor analysis (EFA) to obtain the assumed factor structure, and use LISREL 8.54 to conduct confirmatory factor (CFA) analysis to test the validation of the model.

4 Data Analysis and Discussions

Firstly, we examined the reliability of the whole data by conducting reliability analysis and obtained the Cronbach α of 0.913. Since the α coefficient is relatively high, then data collected and the measurement are considered reliable. Then we have obtained the demographic information of the all respondent. The results of their demographic characteristics are shown in Tab.1.

Tab.1 Demographic statistics of respondent

Demographic statistics	
Sex	
Male:	195, 57.7%
Female:	143, 42.3%
Education	
Undergraduate Student:	188, 55.6%
Graduate Student:	150, 44.4%
Age	
Range:	18 ~ 45
Average:	24.54
Shopper	
Have experience of shopping online:	57, 16.9%
Have no experience of shopping online:	281, 83.1%
Attitude to Shopping Online	
Positive:	283, 83.7%
Negative:	54, 16.3%

After that, we conducted explanatory factor analysis to find the dimensions of online consumer's

perceived risk. We performed principle component analysis and used the orthogonal rotation method of Varimax with Kaiser Normalization that minimizes the number of variables that have high loadings on each factor. We obtained the rotated factor loadings as in the Tab.2. It presents the factor analysis of the PRD. The factor solution explains 63.291% of the variation. The eigenvalues of all factors exceed 1.0. We have the following explanations about those seven factors.

Tab.2 Cronbach α of seven factors from EFA

Factors from EFA	α
Factor 1: e-Store source risk	0.7990
Factor 2: Delivery risk	0.8399
Factor 3: Financial risk	0.7526
Factor 4: Product performance risk	0.6803
Factor 5: Shopping Process risk	0.6793
Factor 6: Privacy risk	0.6282
Factor 7: Asymmetric information risk	0.6334

Factor 1: Fraud Risk. This factor measures a consumer's concerns about seller's reliability in online shopping. Items loading on this factor measure an individual's concern to the opportunistic behavior of the online retailer. It includes seller's reliability and post-services and so on. The highest loading of the item T1 measures the perception to the web store's fraud behavior.

Factor 2: Delivery risk. This factor measures a consumer's concern about product delivery. It covers the concerns about the loss and damage of product, and wrong destination of delivery. The highest loading measures a consumer's concern about the loss of online purchased product.

Factor 3: Financial risk. This factor measures a consumer's concern about monetary loss when shopping through the Internet. It relates to lower discount in online shopping comparing to traditional shopping and extra charges of delivery and online payment.

Factor 4: Process and time loss risk. This factor measures the easy and convenience of a consumer's perception about Internet shopping. The highest loading of the item PS1 measures a consumer's perceived complexity and inconvenience exceeding the expected process of online shopping.

Factor 5: Product risk. This factor measures a

consumer’s concern about the product quality, performance, falseness of a product, and product related problem. The highest loading measures a consumer’s perceived quality.

Factor 6: Privacy risk. This factor measures a consumer’s concern about the security of personal information. It includes a consumer’s home address, telephone number, e-mail address, and account number

of credit or debit cards. The highest loading of the item measures a consumer’s concern about the misuse of home address and telephone number.

Factor 7: Information risk. This factor measures a consumer’s perception of asymmetric information about both of sellers and products. The highest loading of the item measures the concern of a consumer about the lack of information about sellers.

Tab.3 Factor loadings of EFA and Coefficients of Determination of CFA

Factors and Underlying items	Loadings (EFA)	Standardized Coefficients of Determination (CFA)	T (CFA)	R ² (CFA)
Fraud Risk				
T1: Online information about product is not true.	0.784	0.577	10.813	0.333
T2: It is difficult to get support when product fails.	0.716	0.647	12.464	0.419
T3: Can’t find the place where to settle disputes.	0.669	0.735	14.737	0.540
T4: Web store could disappear after running business in short time.	0.585	0.585	10.987	0.342
T5: Fail to keep the promise of post-services.	0.559	0.764	15.526	0.583
Delivery Risk				
D1: The delivered product could be lost.	0.798	0.811	16.861	0.658
D2: Delivered the product to a wrong place.	0.774	0.794	16.379	0.631
D3: The product is damaged during the delivering.	0.751	0.789	16.229	0.622
Financial Risk				
F1: Traditional stores offer more discount than online store.	0.755	0.450	8.019	0.203
F2: Online stores offer discount price but the total cost is not lower.	0.673	0.638	12.081	0.407
F3: Online payment will charge extra fees.	0.642	0.780	15.678	0.609
F4: Delivering to the home will charge relatively higher fees.	0.572	0.761	15.177	0.580
Process and Time Loss Risk				
PS1: The process of online shopping is complex and inconvenient.	0.788	0.519	8.838	0.296
PS2: To deal with PC for accessing Internet will take too much time.	0.687	0.721	12.636	0.514
PS3: Information transformation is too slow during online shopping.	0.668	0.710	12.497	0.504
Product Risk				
PT1: The quality of the product is not accepted.	0.797	0.583	10.120	0.340
PT2: The product performance is not consistent with the expectation.	0.659	0.620	10.858	0.385
PT3: The product may be false and the quality will be poor.	0.567	0.500	8.497	0.250
PT4: It is difficult to return when the product is not satisfied.	0.553	0.651	11.473	0.424
Privacy Risk				
PY1: Worrying about that the personal address, telephone number could be misused by others.	0.727	0.583	10.088	0.340
PY2: My e-mail address could be misused by others.	0.718	0.795	13.716	0.632
PY3: The account number of my credit or debit card could be misused by others.	0.591	0.454	7.666	0.207
Information Risk				
IN2: The information about online suppliers is not sufficient.	0.809	0.715	10.365	0.497
IN1: The information about product to be purchased is not sufficient.	0.788	0.658	9.901	0.432

The presented seven factors structure model has the descriptive power about the dimensions of consumer's perceived risk in online shopping. The model consists of seven factors extracted from selected 24 variables. The Cronbach α coefficient for the 24 variables is 0.8819. That provides the evidence for the reliability of the items measures

Each factor keeps also a relatively higher Cronbach α coefficient (for attitude survey) for the model. Tab.2 lists the Cronbach α coefficients for the seven factor structure model.

To examine the validities of the developed constructs of the model, we also used the results from the EFA to conduct confirmatory factor analysis. We obtained the Coefficients of Confirmation from CFA. The results are shown in the Tab.3.

The purpose CFA is to examine the validity of the model. We used the results of the EFA as our hypnotized model to confirm the validity of the item measures. We use 24 variables as measures and seven factors as latent variables to build a hypothesized measurement model. Then we set the variance of each linear equation to 1 to get the complete standardized estimations of the model. We obtained standardized coefficient estimations and R^2 as listed in the Tab.3. The CFA results show that all coefficients are significant to represent the linear relationship between variables and the related factors. Some R^2 values are acceptable and some of them are relatively low, that represents that those measures still need to improve. CFA is basically involved specification of a hypothesized model and confirm whether this model is confirmed by the underlying data.

CFA is basically involved specification of a hypothesized model and confirm whether this model is confirmed by the underlying data. The better the measures of fit, the more accurate the data in relation to the proposed theory. According to recommendations of some researchers (Hair et al., 1998), X^2 should not be significant, X^2/df is recommend between 1.0~2.0, GFI is better closed to 1, $AGFI$ is recommend more than 0.8, $RMSR$ is recommend closed to 0; $RMSEA$ is also recommend closed to 0, NFI is recommend more than 0.9, CFI is better closed to 1^[12].

Tab.4 lists the results of the goodness of fit from confirmatory factor analysis. All indexes of goodness of fit are acceptable except the X^2 -test. The X^2 -test was highly significant at $p=0.00$. However, X^2 -tests are sample size dependent and favor complex models than simple ones. When it is adjusted for degrees of freedom, these and other measures of fit are acceptable.

Tab.4 Goodness of Fit

Goodness of Fit	
X^2	430.601 ($P = 0.00$)
X^2/df	1.864
Goodness of Fit Index (GFI)	0.907
Adjusted Goodness of Fit Index (AGFI)	0.879
Root Mean Square Residual (RMSR)	0.143
Root Mean Square Error of Approximation (RMSEA)	0.049
Comparative Fit Index (CFI)	0.969

df: Degrees of Freedom (= 231)

5 Implications

Although the primary purpose of this research was to substantiate electronic commerce theory, some managerial implications both for e-commerce researchers and managers can be derived from the resulting research work. Firstly, the research draws attention to consumer's perception of risk in Internet shopping. Some researches focused on the consumer's intentions to buy through retailer's web site, but failed to identify the consumer's perceived risk in online shopping (George Banabanis and Stefanos Vassileiou, 1999)^[13]. This research may raise the interests in consumer's perceived risk about online shopping and motivate managers take account into consumer's concern when make e-commerce strategies.

Perceived risk can be used as overall factor to explain the risk perception and risk deduction strategy used by consumers. Because outcomes of an exchange are uncertain, consumers desire to reduce their risk in purchasing. The dimensions of perceived risk developed in this research are provided for managers when they design their e-commerce strategies to satisfy the consumer's risk reduction need.

Our research has developed a structure model for measuring consumer's perceived risk in online shopping. The 24 variables are identified as measures of consumer's perceived risk. In the structure model, we find out seven factors as dimensions of the consumer's perceived risk in China's Internet shopping context. The factor one is e-store source risk, factor two is delivery risk; the factor three is financial risk; the factor four is purchasing process and time loss risk; the factor five is product performance risk; the factor six is privacy risk; and the factor seven is asymmetric information risk.

research draws attention to consumer's perception of risk in Internet shopping and provides the specifications about the dimensions of Chinese consumer's preserved risk in the online context. It may motivate managers take account into consumer's concern and provide more chances for managers to use our findings for their managerial practice in an e-commerce market environment.

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Brief Introduction to Author(s)

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