An Economic Model of the Consumers' Online Shopping Utility and Factors Affecting on Online Shopping

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ABSTRACT

This paper integrates extant literature on retailing and consumer choice to develop an economic model of consumer choice in which a consumer self-selects on-line shopping. Three important factors impacting consumer choice of on-line shopping: (1) the online shopping utility (2) the consumers' perceived product and service risks (Perceived Privacy Protection, Perceived Security Protection etc.) and (3) consumer and e-vendors qualities (Consumer Disposition to trust, E-vendors' Positive Reputation etc.) . Our model postulates that consumers derive utility from the online shopping experience and are affected by different factors (familiarity, disposition to trust, e-vendors' positive reputation, perceived privacy protection and perceived security protection). Consumers are also more likely to shop on-line from familiar websites and e-vendors than lesser known ones. However, they are less likely to shop on-line from e-vendors or website that does not have explicit privacy and security measures. Empirical verification of the model is carried out using a survey method approach and the results gave support to the postulations based on our theoretical model. Limitations and directions for future research are also discussed.

General Terms

Human Computer Interaction, Computer Application, World Wide Web.

Keywords

Economic model, Consumer utility, Consumer surplus, Consumer self-selection, Perceived risk, e-commerce.

1. INTRODUCTION

A combination of regulatory reform and technological innovation enabled e-commerce to evolve as it has. Although the precursor of the Internet appeared in the late 1960s, Internet e-commerce took off with the arrival of the World Wide Web and browsers in the early 1990s and the liberalization of the telecommunications sector and innovations that greatly expanded the volume and capacity of communications (optic fiber, digital subscriber line technologies, satellites) (OECD, 1999). After a healthy 12.6% increase to $176.2 billion in 2010, U.S. online retail sales are expected to reach $278.9 billion in 2015, according to the Forrester report, e-commerce growth in 2010 was driven primarily by existing online shoppers who increased their online spending in traditional categories like books and media, and also began to purchase in less popular categories like furniture and home appliances. Thirty percent of growth was attributed to the 5.5 million consumers who shopped online for the first time in 2010 (Forrester, 2011).

In the face of such escalation, we are interested to find out more about consumers' choice with regard to shopping for goods at the virtual storefront and to identify various factors that impact their choice. At the same time, however, it is also well known that there is considerable resistance among many Internet users to engage in the business-to-consumer transactions over the Web, primarily due to concerns about trust of internet and risks. An effective acceptance of e-purchasing, e-retailers need to understand the consumers' sensitivity towards the e-commerce trust and satisfaction which is totally different from brick-mortar ones (Azam et al., 2012).

We draw on the economics and the marketing literature on consumer behavior to develop a model of consumers' self-selection. In our model, the consumer chooses to shop on-line for a product/service by maximizing his/her consumer surplus arising from the shopping experience. This shopping experience takes into consideration two main factors affecting the choice of shopping context: the shopping context utility and the perceived risks of product and service failures associated with different shopping contexts. The model allows us to derive propositions that show that consumers value online shopping experience, and factors that reduce the risk to shop online for products/services. The model propositions are also tested empirically.

The rest of the paper is organized as follows. The next section contains the literature review and the development of the theoretical model. The propositions and hypotheses are derived in Section 3, and Section 4 describes the research methodology. The data analysis is presented in Section 5, and Section 6 discusses the results and concludes the paper with limitations and directions for future research. References are given in section 7. All proofs of the propositions presented and questionnaire items are contained in Appendix A and B.

2.LITERATURE REVIEW AND MODEL DEVELOPMENT

Consumers often act on information that is less than complete and far from perfect. As a result, they are often faced with at least some degree of risk or uncertainty in their purchasing decisions. However, risk is not the only factor consumers are sensitive to in the context of an Internet purchase; the perceived benefit provides consumers with an incentive for purchase behavior (Wilkie and Pessemier, 1973). Combining perceived risk and perceived

benefit, Tarpey and Peter (1975) provided a valence framework which assumes that consumers perceive products as having both positive and negative attributes, and accordingly consumers make decisions to maximize the net valence resulting from the negative and positive attributes of the decision. Recognizing this, this paper develops a theoretical model of consumers' shopping behavior to examine their preference for shopping on-line.

2.1Consumer Utility

A consumer's utility from a purchase (U(X)) is dependent on the attributes (X) of the purchase (Lancaster, 1991), which can be tangible (X_t) or intangible (X_s) in nature and which in combination defines a consumer's total shopping experience (Babin et al., 1994). In the retail context, the tangible attributes consist of the physical features that define the product retailed. The intangible attributes are made up of the various attributes that define the retail service, which include pres ale, sale and after sale services, and the shopping atmosphere. A consumer's utility from a shopping experience is therefore defined by $U(X) = U(X_t, X_s)$, which we assume is separable.

$$U(X) = U(X_t) + U(X_s) \quad (1)$$

To the extent that a consumer cannot always be certain that all of his/her buying goals will be achieved, risk is perceived in most purchase decisions (Cox, 1967). Consumers perceived financial, product performance, psychological, physical, social, and time risks when making purchases (Jacoby and Kaplan, 1972-8; Peter and Tarpey, 1975; Garner, 1986; Mitchell, 1992; Schiffman and Kanuk, 1994). In making a purchase, consumers therefore rely on their expectations of the utility of the purchase, E(U(X)). To explicitly capture a consumer's concern about purchase risks, let $U_{iH}, i = t, s$ be the consumer's utility if there are no failures in the shopping experience. This means that the product performs as promised by the seller ($U_{iH} = U_{tH}$) and that the services rendered are, or better than, as expected ($U_{iH} = U_{sH}$) . In addition, let U_{iL} be the consumer's utility in the event of failure, and let γ_i be the probability of failure. This can happen if the product fails to perform as promised by the seller ($U_{iL} = U_{tL}$), or if the services promised by the seller are not or only partially rendered ($U_{iL} = U_{sL}$). Without loss of generality, we assume that consumers are risk neutral. Hence, a consumer's expected utility from a shopping experience can be defined as $E\big(U(X_i)\big) = U_{iH} - \gamma_i(\Delta U_i)$. Substituting this into Eq. (1),

$$E\big(U(X)\big) = \sum_i E\big(U(X_i)\big) = \{U_{tH} - \gamma_t(\Delta U_t)\} + \{U_{sH} - \gamma_s(\Delta U_s)\} \quad (2)$$

For a given product, $U_{tH} = U^0$ is constant across shopping contexts. Shopping on-line is more complex than traditional shopping, where consumers select, purchase and then leave a store with their goods. The on-line shopping process involves finding an appropriate site and then navigating that site to select and make purchases. The next part of the process involves waiting for fulfillment, checking the order when it arrives, and returning it if there is a problem (Boston Consulting Group, 1998). This implies that $U_{sH} = U_{sH}(r)$, and $\Delta U_s = \Delta U_s(r), r \in \{e\}$, where electronic retailing. We rewrite $U_{sH}(e) = U_e$ to represent a consumer's shopping context utility that is derived from on-line shopping, when the product and/or services are delivered as promised by the seller. Similarly, we rewrite $\Delta U_s(r) = \Delta U_{sr}$. Hence, Eq. (2) becomes,

$$E\big(U(X)\big) = [U^0 + U_e - \{\gamma_t(\Delta U_t + \gamma_s(\Delta U_{se})\}]/r = e \quad (3)$$

In eq (3), the term $\{\gamma_t(\Delta U_t) + \gamma_s(\Delta U_{sr})\}$ represents a consumer's perceived purchase risk, which depends on his perceptions of the probability of product failure (γ_t) and retail service failure (γ_s), and the consequences of such failures as defined by ΔU_t and ΔU_{sr}, respectively. For a given product, ΔU_t is constant across shopping contexts. However, consumers' perceived failure rates (γ_t *and* γ_s) differ across shopping contexts. Past research has found that in-home shopping, such as ordering by the telephone or mail, was perceived to be of higher risks than in-store shopping (e.g., Cox and Rich, 1964; Spence et al., 1970). Since Internet shopping is a high technology form of non store shopping, consumers will tend to perceive a higher level of risk when purchasing products through the Internet than by in-store means. Taking this into account and rewriting $\gamma_i(r) = \gamma_{ir}$, eq. (3) becomes,

$$E\big(U(r)\big) = [U^0 + U_e - \{\gamma_{te}(\Delta U_t) + \gamma_{se})\}]/r = e \quad (4)$$

2.2Consumer Surplus and Self-selection

Let p be the price of a given product/service charged by the retailer. Including price in the consumers' utility function (5), we obtain the consumers' surplus function S, which explicitly recognizes that, in making a purchase, consumers are concerned with both the utility derived from the purchase as well as the cost of acquisition.

$$S(r) = [U^0 = U_e - \{\gamma_{te}(\Delta U_t) + \gamma_{se}(\Delta U_{se})\} - p]/r = e \quad (5)$$

We assume that a consumer maximizes surplus in deciding from which website shop, by self-selection. Hence, his/her objective function is defined by,

$$maxS(r) = max_r\{S(e) \quad (6)$$

Where

$$S(e) = [U^0 + U_e - \{\gamma_{te}(\Delta U_t) + \gamma_{se}(\Delta U_{se})\} - p]$$

3. PROPOSITIONS AND HYPOTHESES

If the market is competitive, then p = P*, the competitive market price, which is invariant across different e-vendors. From eq. (6), a consumer will therefore self-select to shop from a specific e-vendor, if the condition that $[U_{e1} - \{\gamma_{te1}\{\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\}] > [U_{e2} - \{\gamma_{te2}\{\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}]$is satisfied, where e1= first e-vendor and e2 = second e-vendor.

Proposition 1: For a given product/service, a consumer will choose to shop from a specific vendor if $[U_{e1} - \{\gamma_{te1}(\Delta U_t) - \gamma_{se1}(\Delta U_{se1})\}] > [U_{e2} - \{\gamma_{te2}(\Delta U_t) - \gamma_{se2}(\Delta U_{se2})\}]$ *where e1= first e-vendor and e2 = second e-vendor. Otherwise, he/she will choose to shop from second e-vendor.*

Proposition 1 implies that, for a consumer to shop from first e-vendor, the condition that $[(U_{e1} - U_{e2}) - (\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})) - (\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2}))] > 0$ must be satisfied. The term $(U_{e1} - U_{e2})$ captures the difference in a consumer's shopping utility in shopping from first vendor versus second vendor. While the term $\{(\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1}) - (\gamma_{te2}(\Delta U_t) + \gamma_{se1}(\Delta U_{se2}))\}$ describes a consumer's perceived risk of purchase in shopping from first e-vendor relative to second e-vendor.

E-retailers are trying to provide various services and to create the secure atmosphere to enhance the consumers' shopping experience. If first e-vendor is familiar to consumers then consumers would derive greater shopping utility from first vendor shopping experience, we would expect that $U_{e1} > U_{e2}$. A consumer's familiarity based on previous good experience with a Website and the vendor's services (e.g., ease of searching for products and information) should cause the consumer to develop concrete and favorable ideas of what to expect in the future. Consequently, to the extent that a consumer is familiar with a website, he or she is relatively more likely to expect the vendor to honor its obligations. Hence, the hypothesis follows.

Hypothesis 1: Consumers derive greater shopping context utility from familiar e-vendor shopping experience than from non-familiar e-vendor shopping experience, $U_{e1} > U_{e2}$.

Some research has reported that familiarity reduces a consumer's perceived risk, interface complexity or uncertainty because it simplifies the relationship with a selling party (Gefen, 2000; Luhmann, 1998) For example, familiarity with an e-vendor (e.g., amazon.com) would reduce uncertainly and complexity through an understanding of how to search and purchase items through the site and what the transaction procedure involved is based on previous interactions and experiences (Gefen, 2000). We hypothesize that consumers' perceived risk of product failure is higher under non-familiar e-vendor shopping than under familiar vendor shopping, $\gamma_{te2} > \gamma_{te1}$.

Hypothesis 2: Consumers' perceived risk of product failure is higher from non-familiar e-vendor shopping than from familiar e-vendor shopping, $\gamma_{te2} > \gamma_{te1}$.

We also hypothesize that consumers' perceived risk service failure is higher from non-familiar e-vendor shopping than from familiar e-vendor shopping, $\gamma_{se2} > \gamma_{se1}$. This is because the Internet has very little security and users risk disclosure of proprietary information (Pallab, 1996), which explains in part the unwillingness of credit card issuers to underwrite online commerce (Reuters, 1998).

Hypothesis 3: Consumers' perceived risk of service failure is higher from non-familiar e-vendor shopping than from familiar e-vendor shopping, $\gamma_{se2} > \gamma_{se1}$.

Consumer disposition to trust (CDT) refers to a customer's individual traits that lead to expectations about trustworthiness, a consumer-specific antecedent of trust. If a consumer has a high tendency to trust others in general, this disposition is likely to positively affect his or her trust in a specific selling party, whereas a consumer with a low tendency to trust others in general is likely to develop a relatively lower trust in a specific selling party (McKnight et al., 1998).To extend eq. 4 to consumer disposition to trust, let $R(U)$ be a consumer's utility as a result of purchase risk level (ΔU). Compared to $E(U)$, which is linear in ΔU, $R(U)$ is nonlinear in ΔU. For consumer disposition to trust, $E(\Delta U)$ is strictly decreasing and concave in (ΔU) such that for a given purchase risk level $(\Delta U)^0, R((\Delta U)^0) < E((\Delta U)^0)$. Let $R_H((\Delta U)^0)$ and $R_L((\Delta U)^0)$ be the utility for a high disposition to trust and a low disposition to trust consumer, respectively, for a given purchase risk level$(\Delta U)^0$. Hence, we hypothesize that:

Hypothesis 4: Consumers with high disposition to trust would be more likely to shop from e-vendor than consumers with low disposition to trust: $R_H((\Delta U)^0) < R_L((\Delta U)^0)$.

Positive reputation of e-vendor has been considered a key factor for reducing risk (Antony et al., 2006) because it provides information that the selling party has honored or met its obligations toward other consumers in the past. Reputation refers to the degree of esteem in which consumers hold a selling party. If consumers perceived on-line shopping to be of higher risks, $\gamma_{ie} > 0$, then their decision on whether to shop on-line would depend on the reputation of e-vendor as defined by its risk levels $\Delta U_t$and ΔU_{sr}. If ΔU_t and ΔU_{sr} are sufficiently small, then the condition that $0 < \gamma_{te}(\Delta U_t) + \gamma_{se}(\Delta U_{se})$, where e1 is the first e-vendor with positive reputation and e2 is e-vendor with negative reputation.

Proposition 2: If $\gamma_{ie1} > \gamma_{ie2}$*, then for values of* ΔU_t *and* ΔU_{sr} *are sufficiently small because of e-vendor positive reputation,* $0 < \{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\} < \gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})$ *where e1 is the first e-vendor with positive reputation and e2 is e-vendor with negative reputation.*

Proposition 2 implies that consumers are more likely to shop from e-vendors that have positive reputation(ΔU_{PR}), and are less likely to from e-vendors that have negative reputation(ΔU_{NR}). Hence, the hypothesis follows.

Hypothesis 5: Consumers are more likely to shop from e-vendors that have positive reputation (ΔU_{PR}) *than those that have negative reputation*(ΔU_{NR}).

Studies have shown that the illegal collection and sale of personal information could harm legitimate consumers in a variety of ways, ranging from simple spamming to fraudulent credit card charges and identity theft (Ratnasingham. 1998).For e-vendors with reputation to protect consumer's confidential information , consumers' perceived risk of purchase from such e-vendor is invariant, $\gamma_{te1} = 0$. Consumers' perceived purchase risk in shopping from e-vendors therefore amounts to $\gamma_{se1}(\Delta U_{se1}) - \gamma_{se2}(\Delta U_{se2})$, which is less than that when $\gamma_{ie1} > \gamma_{ie2}$.

Proposition 3: Consumers' perceived risk of purchase from e-vendors is lower when $\gamma_{te1} = 0$ *, compared to that when* $\gamma_{te1} > \gamma_{te2}$, $\{(\gamma_{te1}(\Delta U_{se1}) - (\gamma_{te2}(\Delta U_{se2}))\} < \{(\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})) - (\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}$.

Proposition 3 implies that consumers are more likely to shop from e-vendors if the e-vendor will ensure to protect consumer's confidential information collected during electronic transactions from unauthorized use or disclosure (PPP) ($\gamma_{te} = 0$) than if the e-vendors can not ensure the consumer of perceived privacy protection (PPP) ($\gamma_{te} < 0$). Consumers often perceive that one of the obligations of a

seller is that the seller should not share or distribute the buyer's private information. Consequently, if buyers perceive that the seller is unlikely to protect their privacy, they will perceive greater risk concerning the transaction with the seller. Therefore, for many online consumers, loss of privacy is a main concern, and the protection of transaction information is crucial. Hence, we hypothesize that:

Hypothesis 6: Consumers are more likely to shop from e-vendor that ensures the consumers' perceived privacy protection (PPP) than from e-vendor that unlikely to ensure them.

For well established retailers who possess a reputation to fulfill security requirements such as authentication, integrity, encryption, and non-repudiation, consumers' perceived risk of security in buying from such retailers becomes invariant, $\gamma_{e1} = 0$ and service failure in buying from such e-vendor would be less $\gamma_{se1} = 0$. E-vendors with such reputation would also serve as a signal of the quality of the products they carry, which implies that $\gamma_{te} \to 0$. Given that $\gamma_{se} = 0$ and $\gamma_{te} \to 0$, consumers' perceived security protection (PSP) and purchase risk in shopping from e-vendor is therefore $\gamma_{se2}(\Delta U_{se1} - \Delta U_{se2})$, where $se_2$is e-vendor with partial security features, which is less than that when $\gamma_{te1} > \gamma_{te2}$ and $\gamma_{se1} > \gamma_{se2}$, , or when $\gamma_{te1} = \gamma_{te2}$ and $\gamma_{se1} = \gamma_{se2}$.

Proposition 4: Consumers' perceived risk of purchase in shopping from e-vendor when $\gamma_{se1} = 0$ *and* $\gamma_{te1} \to 0$, *is lower than that when* $\gamma_{te1} > \gamma_{te2}$ *and* $\gamma_{se1} > \gamma_{se2}$, *or when* $\gamma_{te1} = \gamma_{te2}$ *and* $\gamma_{se1} = \gamma_{se2}$, *and is such that* $\{\gamma_{se2}(\Delta U_{se1} - \Delta U_{se2})\} < \{\gamma_{se1}(\Delta U_{se1}) - \gamma_{se2}(\Delta U_{se2})\} < \{(\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})) - (\gamma_{te2}(\Delta U_{te2}) + \gamma_{se2}(\Delta U_{se2}))\}$.

Proposition 4 implies that consumers are more likely to shop from a specific e-vendor if it implement the security measures ($\gamma_{se} = 0$ and$\gamma_{te} \to 0$) than by those having no security measures on web site ($\gamma_{te1} > \gamma_{te2}$ and$\gamma_{se1} > \gamma_{se2}$). We therefore hypothesize that:

Hypothesis 7: Consumers are more likely to from e-vendor that ensures the consumers' perceived security protection (PSP) than from e-vendor that unlikely to ensure them.

All proofs of the propositions presented are contained in Appendix A.

4. RESEARCH METHOD

In this section, a description of the data and methods utilized in the analysis are provided.

4.1Survey instrument

A survey questionnaire was developed based on the characteristics of the selected factors referred to in the previous sections. The factors are related to the consumers' value online shopping experience and factors that reduce the risk to shop online for products/services, all elicited by using a seven point Likert scale ranging from 1 "strongly disagree" through to 7 "strongly agree". A diverse range of variables relating to these factors was identified from a review of the literature, and was modified and incorporated into a new questionnaire. The questionnaire was confirmed through discussion with two university professors and PhD candidates. Two preliminary tests of the questionnaire were conducted. In the first test, understanding of the description of variables was tested on 8 participants, and in the second, construct validity of the questionnaire was examined with data from 20 MBA students in a business school. Reliability was examined using Cronbach's α values for each construct. The findings showed that the Cronbach's α value of all of constructs were 0.81 to 0.90, demonstrating a good reliability. The questionnaire was finalized after refinement of the variables and the clarification of ambiguities identified in the test (appendix B).

4.2Survey and data collection

In this study, two groups of respondents were selected on the grounds of their being frequent purchasers in electronic commerce or having knowledge of product and service characteristics in electronic commerce. The groups were white-collar employees and university students who attended relevant classes. These three groups are the frequent customers in electronic commerce. The sampling strategy was to select respondents belonging to these specialized customer groups from broader target populations and to sample specifically from the customer groups in provincial cities, where there is an obvious need to consider the customer needs of geographical accessibility when purchasing goods and services in electronic commerce. White-collar employees were chosen from the students of several MBA classes at the College of Economy and Business Administration, Chongqing University to which the author is affiliated and the university students from various undergraduate classes. Surveys were conducted in different classrooms for diverse respondent groups. A total 219 respondents attended. For final analysis, 135 respondents out of 185 questionnaires (male 65, female 70) were used. Thirty four questionnaires were excluded owing to having numerous missing answers.

Table 1. Demographic characteristic of respondents

	No. of Responden-ts		**No. of Responden t-s**
Gender		**Internet use**	
Male	65	1-3 years	3
Female	70	3-7 years	57
		Over 7 years	75
Age distributio n		**Group**	
		Employees	60
		Students	75
21-30 years old	65		
31-40	45		
41-50	20		
Over 50	5		
Mean age	33		
Education		**Purchasing experience in EC**	
University students	63		
University graduates	72	Yes	133
		No	2

In addition, Table 1 shows the demographic characteristics of the respondents.

The number of questionnaires used in the analysis is considered to be appropriate when maximum likelihood estimation is employed for structural equation modeling as in this study. Hair et al. (2006) suggests that the model

containing five or fewer constructs, each with more than three items (observed variables), and with high item communalities (.6 or higher), can be adequately estimated with samples as small as 100–150. Furthermore, 100–150 is the minimum recommended sample size when employing the maximum likelihood estimation method (Ding et al., 1995).

5. DATA ANALYSIS

Our data was analyzed by partial least squares (PLS), a structural equation modeling (SEM) technique. PLS employs a component-based approach for estimation purposes (Lohmoller, 1988). Typically, PLS is better suited for explaining complex relationships. PLS Graph, version 3.0, was used for our analysis. The bootstrap re-sampling method (500 re-samples) was employed to determine the significance of the paths within the structural model. We investigated the common method bias by employing Harman's one-factor test (Podsakoff et al., 2003). This test found no significant bias in our dataset that were due to the survey methodology.

5.1Measurement Validation

We assessed reliability using internal consistency scores, calculated by the composite reliability scores. Internal consistencies of all variables are acceptable because they all exceed 0.90 (descriptive statistics and composite reliability are shown in Table 2). Convergent and discriminant validity is adequate (i) when the PLS indicators load much higher on their hypothesized factor than on other factors (own loadings are higher than cross loadings) and (ii) when the square root of each factor's average variance extracted (AVE) is larger than its correlations with other factors (Chin, 1998).

The first test was performed by the use of the PLS confirmatory factor analysis procedure where all items loaded well on their respective factors. All loadings are much higher than all cross loadings. Factor loadings and cross-loadings for the multi-item measures are omitted for brevity. Second, as shown in Table 2, the square root of all AVEs is much larger than all other cross correlations. Jointly, these findings suggest adequate convergent and discriminant validity.

5.2Testing the structure model

Our overall analysis results are shown in table 3. The standardized PLS path coefficients and R2 values are shown in the table.

As assumed, familiarity significantly affects online shopping utility, accounting for 50% of the variance. Overall online shopping utility (path = 0.26), risk of product failure (path = 0.29) and the risk of service failure (path= 0.42) are all significantly related to familiarity and collectively explains 50% of its variance. Disposition to trust is significantly effects online shopping (path = 0.39), which explains 44% of the dependent variable's variance.

Table 2 Descriptive statistics and Correlation matrix

Construct	FA	DTT	PR	PPP	PSP
Familiarity (FA)	0.91				
Disposition to Trust (DTT)	0.57	0.90			
Positive Reputation (PR)	0.62	0.68	0.89		
Perceived Privacy Protection (PPP)	0.58	0.66	0.70	0.95	
Perceived Security Protection (PSP)	0.56	0.61	0.65	0.68	0.97
Mean	4.81	4.56	4.80	4.77	4.42
Std. dev.	1.21	1.07	1.35	1.00	1.15
Construct reliability	0.94	0.95	0.91	0.96	0.94

Note: Values on the diagonal are the square-root of the average variance extracted for each construct (AVE).

Online shopping is significantly influenced by positive reputation of e-vendors (path = 0.19), which accounts for 39% of the dependent variable's variance. Similarly, online shopping is also significantly affected by perceived privacy protection (PPP) (path = 0.35) and perceived security protection (PSP) (path = 0.47), which accounts for 42% and 51% of the variance respectfully.

Table 3 PLS results for causal paths (n=135)

Hypotheses	Causal Paths	R^2	t-value
H1	$U_{e1} > U_{e2}$.	0.50	0.26***
H2	$\gamma_{te2} > \gamma_{te1}$	0.50	0.29***
H3	$\gamma_{se2} > \gamma_{se1}$	0.50	0.42***
H4	$R_H((\Delta U)^0) < R_L((\Delta U)^0)$	0.44	0.39***
H5	$(\Delta U_{PR}) \longrightarrow (\Delta U_{NR})$	0.39	0.19***
H6	PPP $\longrightarrow \gamma_{te}$	0.42	0.35***
H7	PSP $\longrightarrow \gamma_{te}, \gamma_{se}$	0.51	0.47***

**p < 0.05; **p < 0.01; ***p < 0.001*

6. DISCUSSION AND CONCLUSION

Support for 1, 2, 3, 4, 5, 6 and 7 provide empirical verifications for our economic model of consumer adoption about the online shopping context. The result for Hypothesis 1, 2, 3 confirms that familiarity (FA) had a strong direct influence on consumers' online shopping utility, risk of product failure and risk of service failure. One possible reason for this significant effect could be that when a consumer has developed a pattern of purchasing from a given e-vendor website, due to the familiarity the consumer has developed with the website the consumer may simply purchase again due to habit (simply returning to a website without really taking the time to consider alternate websites or vendors) or utility (returning to a website simply because one can quickly and easily navigate the search and purchase protocols). Considering the relationship between familiarity and product/service failure risk, we argue that familiarity by its nature deals with complexity or uncertainty related to interfaces or procedures (e.g., searching and ordering products and/or services) which can reflect a vendor's competence and therefore its ability to honor its obligations (i.e., its trustworthiness).

We found that a consumer's disposition to trust (DDT) had a significant effect on consumer online shopping. This is consistent with previous studies on the relationship between

trust and consumer disposition to trust (McKnight et al., 1998). Since consumers have different developmental experiences, personality types, and cultural backgrounds, they differ in their inherent propensity to trust.

Support of Hypothesis 5, about e-vendor positive reputation and online shopping, shows that consumers are likely to conclude that it is inherently risky to transact with a vendor who has a history of failing to honor its obligations, whereas it is relatively less risky to transact with a vendor who has a history of honoring its obligations. Based on its reputation, a consumer is likely to infer that the selling party is likely to continue its behavior in the present transaction.

Support for Hypotheses 6 and 7 imply that consumer's perceptions of privacy protection (PPP) and security protection (PSP) both had strong influences on online shopping from a specific e-e-vendor. This suggests that both privacy and security are important for consumers as they shop online. That is, although logically it might seem that privacy superfluous when security is present and security is superfluous when privacy is present, our results suggest that consumers independently value privacy and security. In sum, our findings provide strong support for our arguments that consumer's perceptions of privacy protection (PPP) and security protection (PSP) increase a consumer's trust as well as decrease a consumer's perceived risk in completing an e-commerce transaction.

6.1 Limitations and directions for future research

Future research will be needed to assess the generalizability of our findings. While our research participants reflect a fairly typical band of actual and potential Internet consumers, they may not be representative of all consumers. For example, older consumers may be even less comfortable with online purchasing due to their lack of familiarity with computers and the Internet. It is likely that for these consumers, risk will loom even larger than for younger, more experienced individuals, therefore our model may be equally if not more predictive of purchase decisions for such consumers. Yet research is needed to consider whether this is so. Although our model received strong empirical support, we would also like to recognize the possibility of alternative models for understanding the relationships among the constructs examined in our study.

Given the early stage of research on the topic of utility and consumers' perceived risk in internet transactions, our aim in the present study was only to test the theoretical framework of the study, not advocate one particular model or framework over another. Thus, future research may fruitfully consider how these alternative models of the relationships among utility and consumers' perceived risk, and their antecedents, may complement or contradict each other, the various conditions under which the models may or may not hold, and ways in which the models might potentially be integrated.

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APPENDIX A

Proof of Proposition 1: $S(e1) > S(e2) \Rightarrow [U^0 + U_{e1} - \{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\} - p] > [U^0 + U_{e2} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\} - p] \Rightarrow [U_{e1} - \{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\}] > [U_{e2} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}], given\ p = P^*$. Q.E.D.

Proof of Proposition 2: From Proposition 1,
$S(e1) > S(e2) \Rightarrow [U_{e1} - \{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\}] > [U_{e2} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}] \Rightarrow [(U_{e1} - U_{e2}) - \{\{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}\}] > 0$. hence, if $U_{e1} > U_{e2} \Rightarrow (U_{e2} - U_{e1}) < 0$, then ∃ interior solutions in $\gamma_{ie1}, \gamma_{ie2}, \Delta U_t$, and ΔU_{sr}, such that $S(e1) > S(e2)$. Hence, if $\gamma_{ie1} > \gamma_{ie2}$, then ΔU_t, and ΔU_{sr} must be sufficiently small so that $S(e1) > S(e2)$S. Q.E.D.

Proof of Proposition 3: When$\gamma_{te1} = 0$, $[\{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}] = \{\gamma_{se1}(\Delta U_{se1}) - \gamma_{se2}(\Delta U_{se2})\} < \{(\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})) - (\gamma_{te2}(\Delta U_t + \gamma_{se2}(\Delta U_{se2}))\}$ since $\{\gamma_{te1}(\Delta U_t) - \gamma_{te2}(\Delta U_t)\} > 0$ if $\gamma_{ie1} > \gamma_{ie2}$. Q.E.D.

Proof of Proposition 4: When $\gamma_{se1} = 0$ and $\gamma_{te1} \to 0$, $[\{\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})\} - \{\gamma_{te2}(\Delta U_t) + \gamma_{se2}(\Delta U_{se2})\}] = \{\gamma_{se1}(\Delta U_{se1} - \Delta U_{se2})\} = \{\gamma_{se2}(\Delta U_{se1} - \Delta U_{se2})\} < \{\gamma_{se1}(\Delta U_{se1}) - \gamma_{se2}(\Delta U_{se2})\}$ since $\gamma_{se2}(\Delta U_{se2}) < \gamma_{se1}(\Delta U_{se1})$ if $\gamma_{se1} > \gamma_{se2}$. From proposition 3, $\{\gamma_{se1}(\Delta U_{se1}) - \gamma_{se2}(\Delta U_{se2})\} < \{(\gamma_{te1}(\Delta U_t) + \gamma_{se1}(\Delta U_{se1})) - (\gamma_{te2}(\Delta U_t + \gamma_{se2}(\Delta U_{se2}))\}$ if $\gamma_{te2} > \gamma_{te1}$ and $\gamma_{se2} > \gamma_{se1}$. hence, result follows. Q.E.D.

APPENDIX B

Constructs	Measurement items	loading
Familiarity (FA) adopted from Gefen (2000-29).	• Overall, I am familiar with this site.	0.917
	• I am familiar with searching for items on this site.	0.925
	• I am familiar with the process of purchasing from this site.	0.956
	• I am familiar with buying products from this site.	
	• I am familiar with the product delivering process of this website.	0.931
	• I am familiar with product fulfillment because price shown on the site is the actual amount billed.	0.942
	• I am familiar with the product reliability of this website as the products I looked at were available.	0.911
	• I have experienced the service quality of this website.	0.960
		0.954
		Eigen value 3.54

		% of explained variance 81.62
Disposition to trust (DTT) adopted from Gefen (2000).	• I generally trust other people. • I generally have faith in humanity. • I feel that people are generally reliable • I generally trust other people unless they give me reasons not to.	0.849 0.901 0.868 0.885 Eigen value 2.82 % of explained variance 65.29
Positive Reputation (PR) adopted from Jarvenpaa, Tractinsky, Vitale (2000) and Gefen (2000).	• This Website is well known. • This Website has a good reputation. • This Website vendor has a reputation for being honest. • I am familiar with the name of this Website.	0.870 0.921 0.811 0.789 Eigen value 2.15 % of explained variance 74.15
Perceived Privacy Protection (PPP) adopted from Chen, Han andYu (1996).	I am concerned that • This Website is collecting too much personal information from me. • This e-vendor will use my personal information for other purposes without my authorization. • This e-vendor will share my personal information with other entities without my authorization. • Unauthorized persons (i.e. hackers) have access to my personal information. • I am concerned about the privacy of my personal information during a transaction. • This e-vendor will sell my personal information to others without my permission.	 0.875 0.901 0.823 0.853 0.799 0.793 Eigen value 3.43 % of explained variance 75.01
Perceived Security Protection (PSP) adopted from Chen, Han andYu (1996) and Gefen (2000).	• This Web vendor implements security measures to protect Internet shoppers. • This Web vendor usually ensures that transactional information is protected from accidentally being altered or destroyed during a transmission on the Internet. • I feel secure about the electronic payment system of this Web vendor. • I am willing to use my credit card on this site to make a purchase. • I feel safe in making transactions on this Website. • In general, providing credit card information through this site is riskier than providing it over the phone to an offline vendor.	0.821 0.768 0.790 0.856 0.839 0.873 Eigen value 4.10 % of explained variance 69.51