

Like a Glittering Prize: The impact of Perceived Risk and Trust as Determinants of Online Purchasing Behaviour in the Gemstone Industry

**Steven Ward, Antonia Girardi and Leela Tiangsoongnern, Murdoch Business School,
Murdoch University.**

Abstract

Findings on the impact of perceived risk and trust in online purchasing are usually based on evidence obtained from the purchase of inexpensive, uncomplicated, and hence low risk products such as books, compact disks (CD's, DVD's), or clothing. Antecedents of perceived risk and trust are also not usually addressed in these studies. This study shows that the type of Internet marketing strategy (the place strategy), the buyer's privacy and security concerns influence a buyer's perceived risk to purchase gemstones online. Findings also show that perceived risk reduces trust and trust was positively associated with the amount purchased online.

Introduction

Pierre Omidayr, the founder of eBay back in 1995 identified some of the main obstacles to the development of online retailing.

"The whole idea was just to help people do business with one another on the Internet. And people thought this is impossible, because how could people on the Internet- remember this was 1995- how could they trust each other? How could they get to know each other"? (cited in Goldsmith and Wu 2006, p. 129).

Even today, some 12 years later, with estimated sales of online purchased expected to reach US\$316 billion by 2010 (Shop.org, 2006a), the main drivers of e-commerce remain, including the notion of building trust (Belanger, Hiller, and Smith, 2002; Dillon and Reif, 2004; Fung and Lee, 1999; Gefen, 2000; Shim, Slyke, Jiang, and Johnson, 2004; Vijayasarathy and Jones, 2000) and reducing the risk of purchase (Kim and Montalto, 2002; Heijden et al., 2003; Chellappa and Pavlou, 2002).

To compensate for concerns about risk and to find sources of trust, online consumers rely on the information provided to them by sellers or the trader's policies which secure their personal information and protect their privacy (Heijden et al., 2003). While protection from fraud may be difficult, guarantees provided by online retailers are seen as an important means of gaining the trust of consumers (Chellappa, 2003 and Wind and Mahajan, 2001). This paper examines these set of factors as shown in the conceptual/results model in figure 1, for a particularly risky, and more expensive product, gemstones. Discussion is centred on each of the parts of the model. The model contains both managerial actionable antecedents as well as consumer evaluations. Actual amounts purchased online were used to evaluate the model.

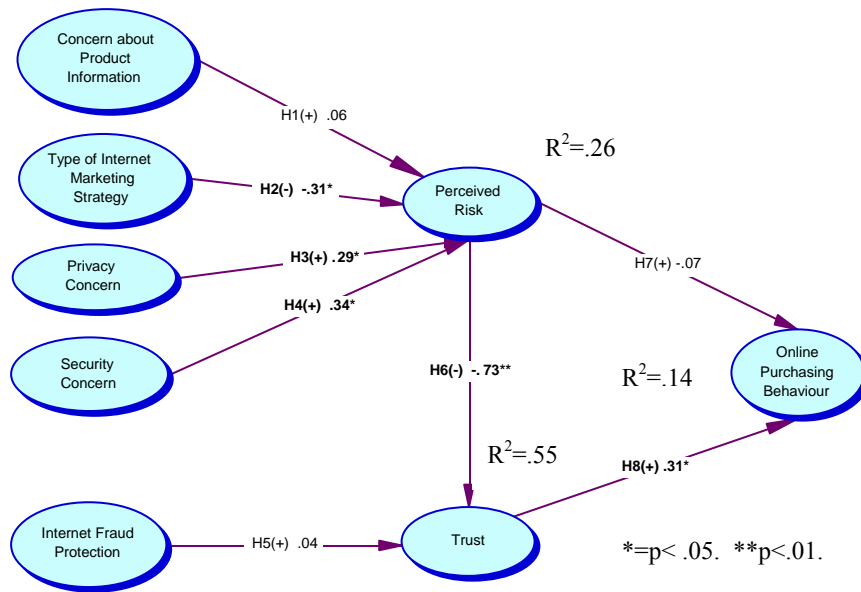


Figure 1 Conceptual Model with Partial Least Squares Results

Literature Review

Concern about Product Information and Perceived Risk

Perceived risk in online purchases can be defined as negative consequences that may occur as part of a transaction (Jarvenpaa, Tactinsky and Vitale 1999 and Miyazaki and Fernandez, 2000 and 2001). As perceived risk is an uncomfortable state of affairs, consumers will look for means to reduce it. A buyer could use several product characteristics, such as performance and price to assess the risk before purchasing the physical products (Ueltschy, Krampf, and Yannopoulos, 2004; Zikmund and Scott, 1977). This is supported by research on online consumer behaviour (Mitchell 1999 and Ha 2002). In terms of online purchasing of risky products like gemstones this includes information on colour, clarity, cutting, carat weight and origin when considering purchase ("Gems", 2002; GIA, 2001; Hughes, 1997 and Weinburg, 2001). Of concern to any buyer of this type of product is the credibility of this information, thus a concern about product information is associated with a higher level of perceived risk in online purchases. Hence the first hypotheses of the study:

H1: Concern about product information will have a positive impact on the perceived risk of online gemstone buyers.

The Type of Internet Marketing Strategy and Perceived Risk.

Online marketers can also provide information about marketing strategies, which could assist in decreasing the buyer's perceived risk to purchase (Poel and Leunis, 1999). This can include offering price discounts (Kim et al., 2000 Gopal et al., 2005, and Hu, 2005), credible information about products (Pires et al., 2004), using established brand names (Ha 2002) and offering convenience through multi-channel distribution, which includes other online and offline marketing channels (Lee and Huddleston, 2006). Hence the next hypotheses of the study:

H2: Types of Internet marketing strategies (product, price, place, promotion) will have a negative impact on the perceived risk of online gemstone buyers.

Privacy Concerns and Perceived Risk

Online buyers are highly concerned about threats to privacy (Culnan, 1999; Hoffman et al., 1999; Kim and Montalto, 2002 and Teltzrow and Kobsa, 2004). Various studies described that a buyer's concern about online privacy was one of the major barriers to the utilisation (acceptance) of online trading (Bush et al., 1998 and Caudill and Murphy, 2000; Culnan, 1999; Gauzente, 2004; Hoffman et al., 1999). Thus our next hypothesis:

H3: Concerns about a seller's privacy practices will have a positive impact on the perceived risk of online gemstone buyers.

Security Concerns and Perceived Risk

Information security (or the threat of breaches via viruses, worms and hacking of online databases) is frequently considered to be a significant issue leading to greater levels of perceived risk of online purchases (Otuteye 2002 and Chellappa 2003). Hence the next hypothesis:

H4: Concerns about a seller's security practices will have a positive impact on the perceived risk of online gemstone buyers.

Trust and its Antecedent, Fraud-Protection policies

Trust is frequently acknowledged as "confidence" in another party (Sheth, 1973; Sheth and Venkatesan, 1968 and Shimp and Bearden, 1980) and is considered as the essential basic element in online trading (Gao et al., 2002 and Brannigan and De Jager 2003).

Having the proper Internet fraud-protection policy is likely to help gain a buyer's trust to purchase online (Chellappa, 2003; Jarvenpaa, 1999; Kimery and McCord, 2002 and Wind and Mahajan, 2001). On the basis of the previous discussion, the following hypothesis was tested:

H5: Buyer perceptions of a seller's practices about Internet fraud-protection will have a positive impact on the trust of online gemstone buyers.

Perceived Risk and Trust: Their Effect on Online Purchases

There appears to be a direct and an interrelationship between perceived risk and trust and the role of both as influences of online purchases. Perceived risk has been found to have a negative relationship with trust (Kimery and McCord, 2002; Swaminathan et al., 1999 and Heijden et al. 2003). Perceived risk has been found to have a direct negative influence on the likelihood/intention to purchase online (Vijayarathy and Jones, 2000; Yeung and Morris, 2006) and the amount purchased online (Doolin et al., 2005 and Miyazaki and Fernandez, 2001). Trust has been found to have a positive effect on the intention to purchase online (Gefen, 2000; Koufaris and Hampton-Sosa, 2002 and Shim et al., 2004). This discussion leads to final set of hypotheses of the study:

H6: Perceived risk will have a negative impact on the trust of online gemstone buyers.

H7: Perceived risk will have a negative impact on the online purchasing behaviour of gemstone buyers.

H8: Trust will have a positive impact on the online purchasing behaviour of gemstone buyers.

Methodology

The sample used was of organisational gemstone buyers who were listed with gemstone and jewellery associations and directories in the U.S.A. While gemstone trading has emerged from every corner of the world, the U.S.A is considered the largest buyers of gemstones online (Buncharoen, 2006; Khaoplum, 2002 and Porncharern, 2006). A Web-based self-administered survey was used to collect data, using email addresses obtained from the sample frame. A sample of 134 representing a 15% response rate was obtained. This response rate was within the range of response rates of virtual surveys (15% to 29%) as noted by Comley (2000), and was higher than that reported by Ranchhod (2001) and Tse (1998) of 6% and 7% percent respectively. The majority of respondents were found to be gemstone dealers (44.96%), followed by gemstone and jewellery dealers (37.98%). Respondents were self-employed and operated within a micro company that had 1-10 employees (75.96%).

Measures

In order to test the already described hypotheses, eight variables were measured. These items for each set of measures are listed in detail in table 1, along with the measurement properties, factor loadings, alpha's, means and standard deviations. All variables were scored using Likert scales from 1 (Strongly Disagree) to 5 (Strongly Agree). The exception was the amount purchased online, which was measured in terms of frequency of purchase (amount of times gemstones were purchased online in the last month) as in past research (Gattiker, Perlusz, and Bohmann 2000 and Miyazaki and Fernandez, 2001).

Results

Figure 1 summarizes the partial least square results. The significance of the path betas were calculated using bootstrapping, and the resultant t-test of paths supports the findings of the study. Such results are not shown in this paper but are available on request from the authors. The results showed support for H2 (Type of Internet Marketing Strategy will reduce Perceived risk, Beta=.31, $p < .05$), H3 (Privacy concern increases the level of perceived risk, Beta=.29, $p < .05$), H4 (Security concerns increase perceived risk, Beta=.34, $p < .05$), H7 (Perceived risk negatively affects trust, Beta= -.73, $p < .01$) and H8 (Trust is positive predictor of online purchases, Beta=.31, $p < .05$). Support was not found for H1 (Concern about product information increases perceived risk, Beta=.06, $p > .05$), H5 (Internet fraud-Protection policies increase trust, Beta=.04, $p > .05$) and H7 (Perceived risk reduces online purchases, Beta=.07, $p < .05$). Overall the model predicts quite well the level of trust, $r^2 = .55$, does a reasonable job in predicting perceived risk, $r^2 = .26$, but less so the level of actual online purchases, $r^2 = .14$.

Discussion

The results of the study show the importance of perceived risk and trust as determinants of online purchases although it appears that perceived risk acts through trust in affecting online purchases (Heijden et al., 2003; Jarvenpaa et al., 1999 and Kimery & McCord, 2002). This study also showed that there are a number of antecedents which managers can influence in order to reduce perceived risk, which in turn should increase trust and therefore online purchases. Marketers need to address privacy concerns, since they are positively related to

perceived risk (H3). They also need to address security concerns (H4) as a failure to do so will increase the perceived risk of online purchase. They can do this by providing policies

Table 1: Measurement Properties

Scale and items and loadings of latent constructs	Fit Statistics			Mean (std deviation)	Alpha Reliability
	χ^2 (df)	RMSEA	RMR		
Perceived Risk (3 items) <i>AVE=0.80</i> I feel that buying gemstone(s) using the Internet is risky (0.75) I feel that it is less risky to buy gemstone(s) using the Internet today (0.78) Buying gemstone(s) using the Internet is safe (0.88)	NA	NA	NA	2.57(0.92)	0.91
Concern about product information (4 items) <i>AVE=0.47</i> concern about treatment disclosure (0.57) concern about naturalness (0.78) concern about origin (0.25) concern about clarity (0.29)	0.43 (2)	0.00	0.02	2.95(0.35)	0.43
Type of Internet marketing strategy used by seller (4 items) <i>AVE=0.51</i> Advertise on web sites of industry (0.77) Buy from general e-marketplaces (0.30) Buy from industry e-marketplaces (0.55) Ease of web site navigation (0.42)	0.54 (2)	0.00	0.02	3.18(0.85)	0.60
Privacy Concern (6 items) <i>AVE=0.89</i> collection of personal information (0.98) type of personal information collected (0.95) not knowing how personal information will be used (0.92) privacy information consists of availability of written privacy policy (0.79) not using systems access to personal information (0.91) not using systems access to transactional information (0.80)	48.11(9)	0.18	0.19	4.45(0.48)	0.90
Security Concern (8 items) <i>AVE=0.92</i> compliance of security practices to well-known security programs (0.99) compliance of privacy practices to well-known privacy programs (0.99) not having seal of security practices from well-known security programs (0.99) compliance of privacy practices to well-known privacy programs (0.99) compliance of security practices by FTC (0.97) not using well-known credit card for payment (0.81) not using well-known online payment systems (0.80) compliance of privacy practices by FTC (0.80)	139.41(20)	0.21	0.38	4.43(0.47)	0.88
Internet Fraud-Protection (4 items) <i>AVE=0.62</i> adherence of payment fraud protection practices to well-known program (0.80) not using well-known financial institutions (0.69) not having guarantee of product delivery (0.28) adherence of non-delivery fraud protection practices to FTC (0.69)	0.05(2)	0.05	0.05	4.49(0.38)	0.65
Trust (4 items) <i>AVE=0.78</i> I feel confident to buy gemstones using the Internet (0.97) feel wary to buy gemstones using the Internet (0.69) I feel more confident to buy gemstones using the Internet (0.88) to date, buying gemstones online tends to be reliable (0.58)	3.06(2)	0.06	0.02	2.70(0.97)	0.85
Online purchasing behavior (1 item)	NA	NA	NA	0.88(0.93)	NA

which protect privacy that is accredited by third parties such as government and by securing information, provided by its customers. Significantly, marketers can reduce the perceived risk of purchases by a particular Internet marketing strategy, in this case by distribution (H2). By making sure gemstones were available by other online channels (e.g. other formalised trading sites or e-marketplaces, see also Lee & Huddleston, 2006). The results did not support the provision that concern for product information increased the perceived risk (H1, see Ha 2002). This may have occurred since the credibility of information regarding gemstones online is hard to gauge, and hence trust, may be considered as exerting a greater influence on a buyer's behaviour than perceived risk. Support was also not found in this study for H5, whereby Internet fraud-protection increases trust. A possible explanation is that the policies of privacy and information security through perceived risk have a greater influence on trust than fraud-protection policies, and that these measures may well encapsulate the fraud-protection policies that can be used by an organisation. The results of this study are limited by sample size and the generality of the sample. Despite these limitations the results of this study provide evidence of a useful framework of online consumer behaviour.

References

- Belanger, F., Hiller, J. S., Smith, W. J., 2002. Trustworthiness in electronic commerce: The role of privacy, security, and sites attributes. *Journal of Information Systems*, 11, 245-270.
- Brannigan, C., De Jager, P., 2003. Building e-trust. *Computerworld*, 37(36), 40.
- Buncharoen, B., 2006. Gemstone trading using Internet. In L. Tiangsoongnern (Ed.). Bangkok.
- Bush, A., Bush, V., Harris, S., 1998. Advertiser perceptions of the Internet as a marketing communications tool. *Journal of Advertising Research*, 38, 17-28.
- Caudill, E. M., Murphy, E., 2000. Consumer online privacy: Legal and ethical issues. *Journal of Public Policy and Marketing*, 19(1), 7-19.
- Chellappa, R. K., Pavlou, P., 2002. Perceived information security, financial liability, and consumer trust in electronic commerce transaction. *Journal of Logistics Information Management*, 15(5/6), 358-368.
- Culnan, M. J., 1999, August 11. Georgetown Internet privacy policy survey: Report to the Federal Trade Commission. Retrieved January 31, 2003, from <http://www.msb.edu/faculty/culnanm/gippshome.html>.
- Dillon, T. W., Reif, H. L., 2004. Factors influencing consumers' e-commerce commodity purchases. *Information Technology, Learning, and Performance Journal*, 22(2), 1-12.
- Doolin, B., Dillon, S., Thompson, F., Corner, J. L., 2005. Perceived risk, the Internet shopping experience and online purchasing behaviour: A New Zealand perspective. *Journal of Global Information Management*, 13(2), 66-89.
- Hoffman, D. L., Novak, T. P., Peralta, M., 1999. Building consumer trust online. *Communications of the ACM*, 42, 80-85.
- Fung, R., Lee, M., 1999. "EC-trust"(trust in e-commerce): Exploring the antecedent factors. Paper presented at the 5th Americas Conference on Information Systems.
- Gattiker, U. E., Perlusz, S., Bohmann, K., 2000. Using the Internet for b2b activities: A review and future directions for research. *Internet Research*, 10(2), 126.
- Gao, T., Wang, Y., Sirgy, M. J., Bird, M. M., 2002. An integrative model on the antecedents of buyer decision making uncertainty in organizational purchasing. *Asia Pacific Advances in Consumer Research*, 5, 41-47.
- Gauzente, C., 2004. Web merchant's privacy and security statements: How reassuring are they for consumers? A two-sided approach. *Journal of Economic Commerce Research*, 5(3).
- Gefen, D., 2000. E-commerce: The role of familiarity and trust. *Omega: the International Journal of Management Science*, 28, 725-737.

- Gems., 2002. Retrieved October 23, 2002, from http://www.thaigem.com/gem_shop.php?loc=fp#pre_gem
- GIA., 2001. Claritytype: GIA clarity types for colored gemstones. Retrieved April 10, 2006, from <http://www.multicolour.com/catalogue/source/cog.html>
- Goldsmith, Jack., Wu, Tim., 2006. *Who Controls the Internet? Illusions of a Borderless World*, Oxford University Press Inc., New York, New York, USA.
- Ha, H.-Y., 2002. The effects of consumer risk perception on pre-purchase information in online auctions: Brand, word-of-mouth and customized information. *Journal of Computer-Mediated Communication*, 8(1).
- Heijden, H. v. d., Verhagen, T., Creemers, M., 2003. Understanding online purchase intentions: Contributions from technology and trust perspectives. *European Journal of Information Systems*, 12(1), 41-48.
- Hoffman, D. L., Novak, T. P., Peralta, M., 1999. Building consumer trust online. *Communications of the ACM*, 42, 80-85.
- Hughes, R. W., 1997. The element of quality. Retrieved September 25, 2001, from <http://www.ruby-sapphire.com/r-s-bk-quality.htm>.
- Hu, Y., 2005. *Essays on Internet markets and information goods*. Unpublished Ph.D., Massachusetts Institute of Technology, Massachusetts, United States.
- Jarvenpaa, S., Tractinsky, N., Vitale, M., 1999. Consumer trust in an Internet store: A cross-cultural validation. *JCMC*, 5(2), 1-34.
- Khaoplum, P., 2002. *Colored gemstone trading using Internet*. In L. Tiangsoongnern (Ed.). Bangkok.
- Kim, D. J., Cho, B., Rao, H. R., 2000. Effects of consumer lifestyles on purchasing behavior on the Internet: A conceptual framework and empirical validation. Paper presented at the 21st International Conference on Information Systems, Atlanta, GA.
- Kim, S., Montalto, C. P., 2002. Perceived risk of privacy invasion and the use of online technology by consumers. *Consumer Interests Annual*, 48, 1.
- Kimery, K. M., McCord, M., 2002. Third-party assurances: Mapping the road to trust in e-retailing. *Journal of Information Technology Theory and Application*, 4(2), 63-83.
- Koufaris, M., Hampton-Sosa, W., 2002. Consumer trust online: Examining the role of the experience with the web site. Retrieved December 15, 2006, from <http://cisnet.baruch.cuny.edu/papers/cis/200205.pdf>.
- Lee, H.-J., Huddleston, P., 2006. Effects of e-tailer and product type on risk handling in online shopping. *Journal of Marketing Channels*, 13(3), 5.

- Mitchell, V.-W., 1999. Consumer Perceived Risk: Conceptualisations and Models. *European Journal of Marketing*, 33(1/2), 163-195.
- Miyazaki, A. D., Fernandez, A., 2000. Internet privacy and security: An examination of online retailer disclosures. *Journal of Public Policy and Marketing*, 19 (Spring), 54-61.
- Miyazaki, A. D., Fernandez, A., 2001. Consumer perceptions of privacy and security risks for online shopping. *The Journal of Consumer Affairs*, 35(1), 27-44.
- Otuteye, E., 2002. Framework for e-business information security management. Retrieved May 24, 2006, from <http://e-commerce.mit.edu/papers/ERF/ERF136.pdf>
- Pires, G., Stanton, J., Eckford, A., 2004. Influences on the perceived risk of purchasing online. *Journal of Consumer Behaviour*, 4(2), 118-132.
- Porncharern, P., 2006. Gemstone trading using Internet. In L. Tiangsoongnern (Ed.). Bangkok.
- Ranchhod, A. Z., E., 2001. Comparing respondents of email and mail surveys: Understanding the implications of technology. *Marketing Intelligence and Planning*, 19(4), 254-262.
- Sheth, J. N., 1973. A model of industrial buyer behaviour. *Journal of Marketing*, 37(October), 50-56.
- Sheth, J. N., Venkatesan, M., 1968. Risk prediction processes in repetitive consumer behavior. *Journal of Marketing Research*, 5, 307-310.
- Shim, J., Slyke, C., Jiang, J., Johnson, R., 2004. Does trust reduce concern for information privacy in e-commerce? Paper presented at the 7th Annual Conference of the Southern Association for Information Systems, Florida.
- Shop.org., 2006a. Statistics: General. Retrieved 16 October, 2006, from http://www.shop.org/learn/stats_usshop_general.asp.
- Swaminathan, V., Lepkowska-White, E., Rao, B. P., 1999. Browsers or Buyers in Cyberspace? An Investigation of Factors Influencing Electronic Exchange. *Journal of Computer-Mediated Communication*, 5(December), <http://www.ascusc.org/jcmc/vol5/issue2/swaminathan.html>.
- Tse, A. C. B., 1998. Comparing the response rate, response speed and response quality of two methods of sending questionnaires: Email vs. mail. *Journal of Market Research Society*, 40(4), 353-362.
- Ueltschy, L. C., Krampf, R. F., Yannopoulos, P., 2004. A cross-national study of perceived consumer risk towards online (Internet) purchasing. *Multinational Business Review*, 12(2), 59-83.
- Vijayasarathy, L. R., Jones, J. M., 2000. Print and Internet catalogue shopping: Assessing attitudes and intentions. *Internet Research*, 10(3), 191-202.

Weinburg, D., 2001. Gems buying guide, the 4c's and more. Retrieved March 1, 2005, from <http://www.multicolour.com/catalogue/columns/column022001.html>

Wind, J., Mahajan, V., 2001. Trust and quality signalling issues in electronic markets. In *Digital marketing: Global strategies from the world's leading experts* (pp. 118-121). New York: John Wiley and Sons, Inc.

Yeung, R. W. M., Morris, J., 2006. An empirical study of the impact of consumer perceived risk on purchase likelihood: A modeling approach. *International Journal of Consumer Studies*, 30(3), 294.

Zikmund, W. G., Scott, J. E., 1977. An investigation of the role of products characteristics in risk perceptions. *Review of Business and Economics Research*, 13, 19-33.