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FROM FEARFUL TO TRUSTFUL – HOW PERCEIVED RISK DIMENSIONS IN E-COMMERCE DIFFERENTIATE BETWEEN CONSUMERS

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Abstract: *The need to segment the market for e-commerce in terms of risk is without doubt of great importance, from a theoretical, but mainly from a managerial point of view. This is why the present study derives a typology of consumers based on six dimensions of perceived risk in online shopping (product, financial, delivery, privacy, social and psychological) and links the resulting risk profiles to several outcome variables. The study is one of the few that offers a new perspective on perceived risk, identifying a two-factor structure: situational risk and individual risk. These two factors were used in a cluster analysis, where four segments were identified: careful consumers, fearful consumers, suspicious consumers and trustful consumers. To offer valuable information for practitioners, these segments are compared in terms of intentions to buy online, online shopping frequency, trust in e-commerce, perceived ease of use, and perceived usefulness of e-commerce.One interesting finding is that suspicious and trustful consumers do not differ in terms of buying intention, even though the difference between them in terms of perceived risk is significant. Implications and further research directions are identified.*

Keywords*: perceived risk, online buying intention, risk profiles, segmentation*
JEL classification*: M3*

1 INTRODUCTION

The interest in perceived risk for marketing dates back to the 1960s, when Bauer (1960) first proposed to analyze consumer behavior as risk taking behavior. Since then, perceived risk has been intensively studied in the marketing literature

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to explain adoption behavior, particularly relating to new technologies such as e-commerce (Featherman&Pavlou, 2003; Li & Huang, 2009; Crespo et al, 2009). Surprisingly, however, little is known about different consumer risk profiles in online shopping and how such profiles can be used for segmentation and targeting purposes. Conchar et al. (2004) specifically suggest that market segmentation efforts should take into account risk characteristics because these can help firms create differentiated strategies to address the needs of specific consumer segments. While, prior research has proposed consumer typologies based on perceived risk dimensions in e-commerce, itdid not link the resulting consumer profiles to outcome variables (Xirong& Yang, 2010); moreover, such typologies were derived based on specific product categoriessuch as electronics or clothing (e.g. Bhatnagar&Ghose, 2004; Zheng et al., 2012). Against this background, the present study (a) develops an empirical typology of consumers based on their perceptions of different kinds of risk associated with e-commerce in general and (b) links this typology to several outcome variables relating to online shopping behavior.

2 CONCEPTUAL BACKGROUND

Cunningham (1967) conceptualized perceived risk in terms of two components: (1) the amount that would be lost if the consequences of an act are not favorable, and (2) the individual's subjective feeling of certainty that the consequences will be unfavorable. Risk is typically approached in the marketing literature as a multi-dimensional construct composed of six dimensions: financial, product, physical, psychological risk, social and time risk (Jacoby & Kaplan, 1972). Financial risk refers to the likelihood of suffering a financial loss due to hidden costs, maintenance costs or lack of warranty in case of faults (Jacoby & Kaplan, 1972). In the context of online shopping, financial risk denotes the possibility of loosing money when paying online (Featherman & Pavlou, 2003; Pires et al., 2004). Product risk refers to the chances of the item failing to meet the performance requirements originally expected of the purchase (Jacoby & Kaplan, 1972). In e-commerce, product risk refers to the fact that the product cannot be touched, tested prior to purchase(Pires et al., 2004; Forsythe et al., 2006). Physical risk measures the probability of the purchase resulting in physical harm or injury (Jacoby & Kaplan, 1972); however, this type of risk is not a real issue in e-commerce as it cannot harm one's health (Cases, 2002). Psychological risk denotes the chances of the specific purchase being inconsistent with the self-image of the consumer (Jacoby & Kaplan, 1972). Social risk gives the likelihood of the purchase resulting in others thinking of the consumer less favourably (external psychological risk) (Jacoby & Kaplan, 1972). Time risk is perceived when some products fail and

consumers waste time, convenience, and effort getting it adjusted, repaired, or replaced (Roselius, 1971). In the case of e-commerce time risk also relates to delivery problems (Pires et al., 2004). A further dimension specific to e-commerce is privacy risk, which refers to personal data that can be hacked and used without the consumer's approval (Featherman&Pavlou, 2003).

Bhatnagar and Ghose (2004) used product risk and security risk to classify consumers who buy electronics online and identified three clusters: high security risk/high product risk; moderate product risk/low security risk and low product risk/moderate security risk. Xirong and Yang (2010) used five dimensions of perceived risk: performance, economic, time, social and psychological and identified five segments: fashionable consumers, individualistic consumers, henchmen, busy-men and money-grubbers. Zheng et al. (2012) analyzed a Chinese consumer sample for the case of shopping online for clothing and also identified five consumer groups: experience risk-taking, self-dependents, personal risk averseness e-shoppers, security sensitive neophytes, and pleasure seeking mature e-shoppers. The five segments were subsequently characterized in terms of risk reducing strategies. Zheng et al. (2012) used ten risk dimensions (product, physical, financial, delivery, privacy, payment, time, source, social, psychological) which resulted in a two-factor model capturing personal (social, psychological and time risk) and non-personal risk. Since the above mentioned studies used specific products to assess perceived risk in e-commerce, the resulting segments are inevitably also product-specific. Moreover, potential differences among distinct risk profiles in terms of outcome variables were not explicitly analyzed.

In this study, perceived risk is conceptualized as the risk of using the Internet as a shopping channel in general rather than with respect to specific products or brands. Moreover, the study examines how different consumer segments differ in terms of several outcome variables, notably trust in e-commerce, online shopping frequency, perceived ease of use, perceived usefulness and intention to buy online.

3 METHODOLOGY

The current study took place in Romania, an emerging market; given that most of the scales measuring perceived risk in e-commerce have been developed in high-income countries (Forsythe et al., 2006; Pires et al., 2004), in-depth interviews were conducted to test the scale items and generate additional ones. This resulted in a pool of 12 new items for perceived risk which were added to 17 items taken from previous studies (Featherman&Pavlou, 2003; Forsythe et al, 2006; Pireset al, 2004). We used established scales for all other constructs: trust,

perceived ease of use, perceived usefulness, intention to buy online (Pavlou, 2003; Featherman&Pavlou, 2003; Crespo et al. 2009; Hernandez et al, 2010).

Two samples of students were used; the first sample (123 students) to purify the measures and the second (426 students) to develop the typology. The choice of students as respondents was supported by the fact that 37% of Romanian online shoppers are between 18-24 years old[1].A questionnaire was used for data collection purposes containing the clustering variables (six dimensions of perceived risk) and the outcome variables (online shopping frequency, trust in e-commerce, perceived ease of use, perceived usefulness and future intention to buy online).

The scales were purified using the first sample, whereby items were dropped on the basis of low reliabilities, insignificant loadings or low squared multiple correlations as revealed by confirmatory factor analysis. Items were not dropped solely on statistical reasons. Content analysis was also used to see if items with poor content validity – calculated as the content validity ratio (Lawshe, 1975), were the same items with poor psychometric properties as yielded by confirmatory factor analysis.The purified scales were subsequently replicated on the second sample and offered satisfactory results in terms of psychometric properties (Table1).

Table 1 – Psychometric properties of scales

Construct	**No. items**	**Cronbach's alpha**	**Composite reliability**	**AVE**
Product risk	5	0.801	0.800	0.671
Financial risk	4	0.747	0.760	0.676
Delivery risk	2	0.766	0.606	0.661
Privacy risk	3	0.683	0.690	0.653
Psychological risk	2	0.701	0.716	0.748
Social risk	2	0.773	0.775	0.796
Perceived usefulness	4	0.802	0.806	0.718
Perceived ease of use	4	0.775	0.798	0.712
Trust in e-commerce	3	0.660	0.666	0.632
Intention to buy online	4	0.936	0.937	0.888

4 RESULTS

To obtain a typology of consumers based on the six perceived risk dimensions, we employed cluster analysis, prior to which a principal components analysis (with oblique rotation) was conducted. This produced a two-factor solution explaining 68.9% of variance, with product risk, financial risk, privacy

[1]GFK report 2011 - http://www.gfk-ro.com/public_relations/press/multiple_pg/009110/index.en.html

risk and delivery risk loading on one factor (situational risk - 49.9%) and social and psychological risk loading on the other factor (individual risk - 18.9%). Subsequently, the resulting factor scores were used as input into a two-step clustering procedure. The first step involved hierarchical cluster analysis and revealed that the sample can be classified into four groups. In a second step, group-centroids were calculated and used as input for a k-means cluster analysis to develop the final cluster solution. The obtained solution was then tested for robustness. Following Sharma (1996), the sample was split into two halves. Hierarchical cluster analysis was done on the first half and a four cluster solution was obtained. Cluster centroids were computed for the six risk dimensions andwere used to perform k-means clustering on the second sample. A second k-means procedure was done on the second sample this time without using the centroids from the hierarchical clustering. Agreement between the assignment of centroids and the separate analysis was of 0.977 (kappa) which indicates a highly robust cluster solution (Table 2).

The four clusters are briefly described below:

- *Careful consumers* (25.6% of respondents) are those who have a moderate level of situational risk and individual risk. While social risk is at a low level, it is the highest of all clusters.
- *Fearful consumers* (17.3% of respondents) have the highest situational risk and moderate level of individual risk; however, social risk has a much lower value compared to psychological risk.
- *Suspicious consumers* (28.2% of respondents) have a moderate level of situational risk and a low level of individual risk. While there seems to be no personal barrier for them to use e-commerce (both psychological and social risk are very low), they assess potential losses in specific situations of online buying.
- *Trustful consumers* (28.7%) are consumers characterized by low levels of both situational and individual risk.

To check the internal validity of the cluster solution, we followed recommendations from Maute and Dube (1999) and performed a multivariate analysis of variance (MANOVA) on the original 18 items representing the scales of risk dimensions. Results yielded a significant result (Hotelling'sT^2=5.063, F37.38, p=0.000) indicating that the clusters differ in terms of perceived risk dimensions in e-commerce.

Table 2 – Consumers segments

Risk dimensions	**Careful consumers**	**Fearful consumers**	**Suspicious consumers**	**Trustful consumers**
	N=108	**N=73**	**N=119**	**N=121**
Financial	4.23	5.47	4.32	2.97
Product	4.90	5.78	4.59	3.17
Delivery	4.83	6.01	5.23	3.59
Privacy	4.32	5.68	4.70	3.28
Psychological	4.35	4.18	1.97	2.08
Social	2.00	1.54	1.28	1.37

were *items measured on a 7-point Likert scale.

External validity of the cluster solution was tested by comparing clusters on a variable not used in the cluster analysis (Singh, 1990). Trust, conceptualized as general belief that online shopping can be trusted (Pavlou, 2003) was introduced in a one-way ANOVA analysis using cluster membership as factor variable. Results showed that the clusters differ significantly in terms of trust in e-commerce (F=64.284, p=0.000). Moreover, the ANOVA confirmed the expected description of clusters; specifically, the fearful consumers showed the lowest level of trust, whereas the trustful ones had the highest level of trust (Table 3).

Table 3 – Trust in e-commerce

Variable	**Segments**			
	Careful	**Fearful**	**Suspicious**	**Trustful**
Trust in e-commerce - mean	4.0449	3.7753	4.7815	5.1884

The four clusters were further profiled on gender, online shopping frequency, perceived ease of use of online shopping, and perceived usefulness of online shopping.

To see if the clusters differ in regards to gender, we first weighted the cases and afterwards used the Chi-square test, which revealed significant differences (χ^2=30.805, df=3, p=0.000). The trustful segment is formed by 68.5% men, whereas the suspicious segment has more women – 62.3% as well as the careful one – 59.6%. The fearful segment is more balanced (45.7% men, 54.3% women). These results are consistent with previous studies that show that women are more risk-averse than men both in general (Finucaneet al, 2000) and with specific reference to online shopping (Gabarino&Strahilevitz, 2004).

Regarding online shopping frequency(Table 4), the careful and the fearful segments have the largest percentage of consumers who have not bought online in the last six months, while the suspicious and trustful consumers have the lowest percentage. The suspicious consumers make an interesting case: 20.2% of them

bought more than four times online in the last six months as opposed to only 13.2% of trustful consumers. Thus, suspicious consumers perceive higher situation risk than trustful ones, yet they seem to buy more often online.

Table4 – Online shopping frequency

Online shopping frequency	Careful	Fearful	Suspicious	Trustful
Never	57.4%	56.2%	22.7%	19.8%
Once	23.1%	20.5%	24.4%	28.9%
Twice	8.3%	13.7%	18.5%	24.0%
3-4 times	7.4%	5.5%	14.3%	14.0%
More than 4 times	3.7%	4.1%	20.2%	13.2%
Total	100.0%	100.0%	100.0%	100.0%

The segments also differ significantly in terms of perceived ease of use and perceived usefulness of online shopping (Table 5). The suspicious and trustful consumers perceive a higher usefulness and ease of use of online shopping; this is consistent with their greater online shopping frequency (see Table 4).The careful and fearful consumers both have moderate levels of perceived usefulness and ease of use; however, they score significantly lower than suspicious and trustful consumers.

Table5 – One-way ANOVA results

Variables	Segments				One-way ANOVA
	Careful	Fearful	Suspicious	Trustful	
Perceived usefulness - mean	4.5785	4.6552	5.5314	5.6931	F= 40.722, p=0.000
Perceived ease of use - mean	5.0024	5.2766	5.9801	5.9960	F= 41.596, p=0.000

Results showed that the segments differ significantly in terms of future intention to buy online (Table 6). However, suspicious and trustful consumers, who have the highest intention to buy online, do not differ (p=0.986). Careful consumers have the lowest intention to buy and are significantly different from fearful consumers (p=0.044).

Table 6 – Intention to buy online

Variables	Segments				One-way ANOVA
	Careful	Fearful	Suspicious	Trustful	
Intention to buy online - mean	3.9211	4.4250	5.8085	5.7519	F= 61.044, p=0.000

5 DISCUSSION, IMPLICATIONS AND FURTHER RESEARCH

The aim of this study was to determine homogenous groups of consumers based on the six dimensions of perceived risk in e-commerce. Data analysis suggested that risk dimensions could be separated in two factors: a situational risk factor and an individual one. Based on these two factors cluster analysis was applied and four consumer segments were identified: careful consumers, fearful consumers, suspicious consumers and trustful consumers. The careful type is represented by consumers who feel a moderate level of risk for all dimensions, except social risk, which actually is very low for all four segments. Careful consumers have small experience with online shopping and exhibit moderate level of trust in e-commerce. Although they find e-commerce to be useful and easy to use, they have to lowest intention to buy online. The next segment has high perceived risk for all situational risk types, moderate psychological risk and low social risk. The fearful segment is also represented by people with low shopping experience and has the lowest level of trust in e-commerce. They perceive usefulness and ease of use in a similar way to careful consumers, yet they have a higher intention to buy. One explanation could be the fact that fearful consumers feel less psychological risk that careful consumers. Suspicious consumers have moderate situational risk and low individual risk. They are experienced consumers with a high level of trust in e-commerce. They perceive e-commerce to be very useful and easy to use and exhibit a high intention to buy online. The trustful consumers have the lowest levels of risk for all dimensions. They are experienced consumers with the highest level of trust in e-commerce. This segment, however, does not differ from the suspicious one in terms of perceived usefulness, perceived ease of use and buying intention.

Profiling the segments on different variables helps marketers in creating strategies that better address each consumer type. In this case, the purpose was to obtain groups of consumers that differ in relation with perceived risk dimensions. Even if the analysis yielded a four cluster solution, further testing showed that two of the segments – suspicious and trustful – which differ in terms of risk, do not differ as far as behavioral and outcome variables are concerned. This could be explained by the fact that in some cases perceived benefits may account for more than perceived risk in influencing online shopping behavior. Forsythe et al. (2006) found that perceived benefits make the difference for how often consumers purchase online. These findings show that it is not sufficient to identify which risks are more salient for which consumers, but it is as important to relate risk profiles to behavior as well.

Results obtained in this study are in line with Zheng et al (2012) that also found a two-factor structure for perceived risk which was subsequently employed to perform cluster analysis. However, they used ten dimensions for perceived risk and they analyzed the case of clothing. This might show that the two-factor model is consistent across different buying situations. Three of the segments identified in our study (worried, suspicious and trustful) were consistent with results from Zheng et al. (2012).

As far as limitations are concerned, it is essential to mention that cluster analysis does not assume inference to the population. Results are mainly sample-dependent and it is possible that using a sample from the same population the solution could be different. We also recognize that the use of students may be a limit as they are known to have high technical skills and to be among early adopters of technology. However, students represent a large segment of the market. Furthermore, perceived risk is a situational construct. In this study we aimed to address a general perception of consumers towards online shopping; however, decision to buy online can depend on several other factors such as product, brand or price. Perceived risk is also a dynamic construct expected to change along with the gained online shopping experience. This issue could be addressed by further research. Moreover, each dimension of perceived risk could be longitudinally studied. Further research should also attempt to replicate this study on a different consumer sample and link risk profiles to other outcome or behavioral variables.

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