Consumer Perceived Risk by Online Purchasing: The Experiences in Hungary

Zita Balogh
PhD Student at University of Sopron, István Széchenyi Management and Organisation Studies Doctoral School, Hungary
balogh.zita@phd.uni-sopron.hu

Katalin Mészáros
University of Sopron, Alexandre Lamfalussy Faculty of Economics, Institution of Business Studies, Hungary
meszaros.katalin@uni-sopron.hu

Abstract

The aim of this paper is to identify and categorize the perceived risks that Hungarian consumers connect with online purchasing. The research is based on empirical data collected via a questionnaire and analysed with statistical software. The applied exploratory factor analysis identified five risk categories connected to online purchasing: perceived after-sale risk, perceived data security risk, perceived delivery risk, and perceived product risk. The fifth risk factor seems the most characteristic to Hungarian customers, who are wary of the possibility of online vendors selling fake products on the Internet. The results offer valuable information to companies engaged in online vending concerning the risk factors Hungarian consumers associate with online shopping. One limitation of this study is that it does not evaluate risk-reducing strategies.

Keywords: perceived risk, perceived risk types, online shopping, consumers' purchasing behaviour, exploratory factor analysis

Introduction

Online shopping has become an intrinsic part of life in the 21st century. More and more consumers are discovering the advantages of purchasing goods via the Internet (Bányai & Novak, 2011). The Internet allows consumers to shop anytime, anywhere, with the ability to compare products and prices with a few clicks, and to read the experiences of other buyers with the desired product and the selected webshop. 63% of the European Union's population purchased goods online in the last 12 months in 2019, with the highest proportions seen in the UK (87%), Denmark (84%), and Sweden (82%). This compares with 22% in Bulgaria, 23% in Romania and 34% in Serbia (Eurostat, 2020). In Hungary, the e-commerce turnover has been increased since the turn of the millennium (Veres, 2018). In 2018, 5.4 million consumers – or 91% of the adult population – purchased goods online (eNet, 2019). The capacity to raise the number of online shoppers in any large-scale manner in Hungary is minimal; hence, the expansion of e-commerce must rely on shopping intensity.

Table 1. Online purchase in the last 12 months in the European Union in 2019 (percentage of individuals)
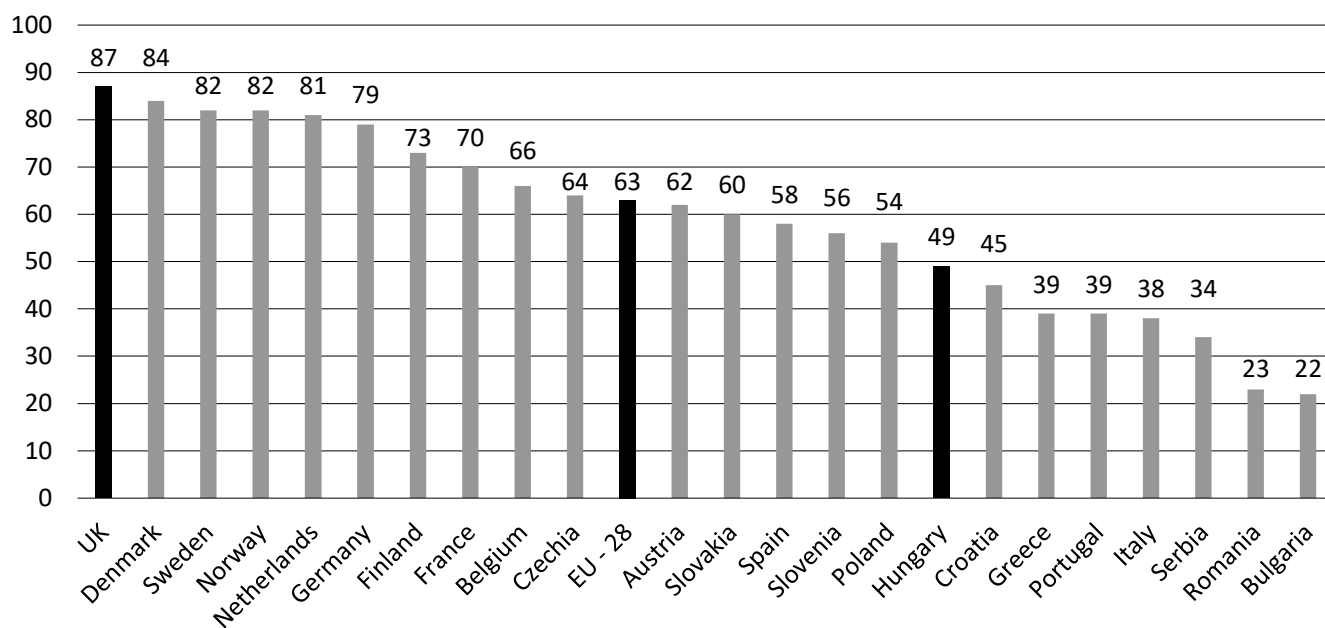
Source: Eurostat, 2020.

The technical, legal, and security requirements of the online shopping have developed steadily over the past two decades. The Internet has become a highly regulated sales channel in the EU. One priority of the European Commission is to ensure safe Internet for all citizens. The development of comprehensive legal framework, the rise of the capacity of law enforcement authorities, and better assistance to victims are the instruments in the EU to combat cybercrime (European Commission, 2020). This would indicate a low risk environment for consumers. Despite these developments, the international crime statistics show a grow in the Internet connected fraud (e.g. credit card fraud, non-payment, non-delivery). In Austria, one of the neighbouring countries of Hungary, the number of Internet fraud cases increased by 313% from 2010 to 2018 (Crime Statistics 2018 of the Federal Ministry Austria, 2019). The National Crime Agency of the United Kingdom reported about 1 million computer misuse offences in 2019 (NCA National Strategic Assessment, 2019). The European Central Bank (ECB) also recognises the increase of credit card fraud; ´23 million stolen credit cards are for sale on the dark web in the first half of 2019´ (IOCTA, 2019). Accordingly, consumers continue to associate purchasing goods online with risk, which ´has an impact on their willingness to use online services´ (European Commission, 2020). At buying online, consumers focus more on avoiding potential risks than on maximising benefits (Kiss & Faragó, 2013). Customers are concerned not only about fraudulent activities, but also the lack of physical trials and the absence of personal contact with sales personnel (Dai, Forsythe & Kwon, 2014). Furthermore, uncertainties could result from perceptual bias as well. Such perceptual bias could arise out of selective attention, selective distortion, and selective memory of the costumers (Kotler, & Keller, 2012).

The empirical research in this paper aimed to explore whether and to what extent Hungarian consumers perceive risks when shopping online. It also sought to uncover latent variables behind the risk items defined in this context. After analysing the results of international publications and following internal discussion about relevant risks in the Hungarian market, a risk catalogue with 23 risk measurement items were generated. 162 questionnaires were used for statistical analysis. The study employed an exploratory factor analysis (EFA) via the extraction method of principal axis factoring to attain its research aims of exploring whether any latent variables behind the risk items exist.

Theoretical Background

In 1960, Harvard Business School Professor Raymond Bauer posited that consumer behaviour can viewed as an instance of risk-taking. He hoped his theory would attract the attention of researchers and practitioners and that it would, thereby, survive its infancy. Over the past 60 years, the perceived risk concept has become a highly researched and successively extended area. Cunningham (1967) reported a two-component model containing the following dimensions: uncertainty and dangerousness of consequence. Roselius (1971) discovered that consumers have preferences for different methods of risk reduction associated with

various types of loss. Jacoby and Kaplan (1972) document-ed the five types of perceived risk: performance, physical, psychological, social, and financial. Concurrently, Roselius added the "time" dimension to the risk type concept. With the rise of the product diversity and of the communication noise around them, it became difficult for the costumer to be perfectly informed about product offers (Kolos, 1997). Risks connected to conventional sales channels were deeply researched by W.V. Mitchell in the 1990s. He stated that consumers are often more motivated to avoid mistakes than they are to maximise utility (Mitchell, 1998). Kotler & Keller (2016) describe six risk types: functional, physical, financial, social, psychological, and time risks.

Online shopping behaviour of consumers started to be analysed at the beginning of the 1990s. The impact of per-ceived risk on shopping attitudes has been examined in an increasing number of empirical studies (Pelaez, Chen, Ch-W. & Chen, Y.X., 2017; Iconaru, Perju & Maconvei, 2012). The work of Forsythe and Shi (2003) must be mentioned in connection to this. Their research identified four types of perceived risk that were important for online shoppers: financial, product performance, psychological, and time/convenience/loss risk. The findings demonstrated that per-ceived risk theory is a useful concept to explain barriers to online shopping. Since that time, numerous studies and even quantitative meta-analyses have been conducted.

The present study mostly considered empirical research studies conducting factor analysis. International publi-cations reported the different kinds of risk categories that consumers link to online shopping (Pi & Sangruang, 2011; Zhang, Tan, W., Xu, Tan, G., 2012; Zheng, Favier, Huang & Coat, 2012; Masoud, 2013; Almousa, 2014; Gerber, Ward & Goedhals-Gerber, 2014; Hsu & Luan, 2017; Bhatti, Saad & Gbadebo, 2018; Nawi, Mamun, Hamsani & Muhayiddin, 2019). The literature generally favours the negative rela-tionship between the variable perceived risk and intention to purchase; however, some studies have not found this re-lationship to be significant or even positive (Pelaez et al., 2017). According to Zhang et al. (2012), five independent dimensions significantly affect online purchase behaviour in China: perceived health, quality, time, delivery, and after-sales risks. Zheng et al. (2012) analysed ten risk di-mensions in China: performance, privacy, source, delivery, time, financial, payment, physical, social, and psychologi-cal. These ten dimensions were classified into two main risk factors: personal and non-personal. A research paper from Taiwan reported that convenience, physical, performance, and social risk factors have the greatest effect on online shopping attitude (Pi & Sangruang, 2011). Masoud (2013) revealed that financial risk, product risk, delivery risk, and information security risk negatively influence online shopping behaviour. Other dimensions in scope (time and

social risk) have no effect on online shopping. Gerber et al. (2014) investigated six perceived risk types in Southern Africa: functional, physical, financial, social, psycholog-ical, and time risks. They stated that risks perceived by their respondents can be grouped into three risk factors: personal, social, and performance risks. Several studies conducted on this topic exist for the Indian online market, where a negative impact of the risks on online shopping was detected (Suresh & Shashikala, 2011, Dash, 2014, Sreya & Raveendran 2016). Suresh and Shashikala (2011) identi-fied six risk factors: monetary, performance, time, source, social, and psychological risks. The study found that all of the mentioned factors have a significant impact on online shopping attitude. Dash (2014) described six major risk factors in India as well, but with slightly different factors. In addition to product risk, psychological risk, and time risk, he identified financial risk, performance risk, delivery ca-pability risk, and website performance risk. Durmus, Ulusu & Akgun (2017) analysed the effect of perceived risks on online purchase intention through word of mouth (WOM) and trust dimensions in Turkey. The study showed that in-formation risk, financial risk, product risk, and WOM inten-sity effects trust and finally the online purchase intention. The findings of a Malaysian study revealed that perceived after-sales, financial, psychological, and social risks had a significant effect on the online purchase behaviour (Nawi et al., 2019). In contrast, a Hungarian study claims, consumers face no risk when purchasing goods in Hungarian online shops other than those of the payment and delivery methods (Szűcs, 2018).

For this paper, an online purchase is defined as the follow-ing: a consumer orders the desired product/service virtually via a mouse click or email through a webshop operated by the seller (Nagy & Keller, 2017). The American Psycho-logical Association defines the term ´perceived risk´ as the ´individual's subjective assessment of the level of risk asso-ciated with a particular hazard (e.g., health threat). Risk per-ceptions vary according to factors such as past experiences, age, gender, and culture´ (APA Dictionary, 2020). Risks in connection with purchasing are always subjective, perceived risks. (Hofmeister-Toth, 2017). It might be even the case that the risk does not exist or is not present in a purchase decision, but the consumer feels it is real.

The focus of the present paper is on the perceived monetary, product, privacy, time, delivery and after-sales risks. The definitions of the different risk types are very heterogenous in the reviewed research papers. Perceived risks in con-nection with loss of money were named in the literature as monetary risk or financial risk or economic risk. Potential loss resulting from unforeseeable costs added to the original product price are also part of the monetary risk. In some studies, this risk type covers losses in connection with fraud

such as credit card abuse, personal information disclosure, and products not received. Risks in connection with the expected product performance are named in the literature as product risk or quality risk or performance risk or functional risk. Perceived time risk covers all kinds of losses associated with wasted time, such as time loss resulting from information searches and transaction processing as well as product delivery, replacement, or repair. Risks in connection with data security cover the loss resulting from the fact that unauthorized people may use personal information without the agreement of the consumer. Perceived delivery risks are connected to the loss resulting from an inadequate delivery (wrong delivery place, damaged goods, long delivery time, etc.). Some definitions in the literature includes packaging and transport handling as well (Masoud, 2013). Perceived after-sales risks are connected to the potential loss resulting from the difficulties at contacting the seller and at consumer rights enforcement.

Methodology

The measurement items were based on the research design of Zhang et al. (2012). After internal discussions, the items were adapted for the Hungarian conditions. The questionnaire was tested by 25 Faculty of Economics students at the University of Sopron. After this pre-test, some small modifications were made in the questionnaire. The risk items were measured with a Likert bipolar scale of 1-5 ranging from "strongly agree" to "strongly disagree". Data collection was performed by students in November 2019 (before the unprecedented COVID 19 lockdown of the economy in Hungary). Each student was instructed to ask four other people in pre-defined age categories to fill in the research questionnaire. A total of 260 questionnaires were distributed to students. Of these, 172 were returned. Four questionnaires missed answering half of the questions. Another six were returned unfilled with the declaration that the person does not buy products online. In the end, 162 questionnaires were analysed with SPSS 22.

Demographical composition of the study sample is presented in table 2.

Table 2. Demographic characteristics of the study respondents

Variable	Frequency	%
Age		
-25	57	35,19
16-40	31	19,14
41-60	45	27,78
61-	29	17,90
Gender		
Male	64	39,50
Female	98	60,50
Education		
Primary school	2	01,20
Skilled worker qualification	28	17,30
High school	89	54,90
Academic degree (BA, MA, PhD)	43	26,50
Family status		
Married	63	38,90
Relationship	51	31,50
Single	48	29,60

Originally, 23 risk items were included in the questionnaire. After internal discussion, two risk dimensions were excluded from the research design, as the questions essentially suggested the answer, which would have been inappropriate. The remaining 21 risk dimensions were yielded into the SPSS software for EFA.

The present study followed the general EFA procedure (Field, 2012), which included an initial data screening followed by factor extraction and factor rotation as part of the main analysis and reliability analysis afterward.

The sampling adequacy measured by the KMO (Kaiser-Meyer-Olkin) criterion for this EFA was 0.749. A KMO statistic ´close to the value 1 indicates the patterns of correlations are relatively compact´ (Field, 2012). Kaiser (1974) recommends values greater than 0.5 as acceptable. Bartlett's test is relevant for sampling adequacy. As shown in Table 8,

Table 3. Sampling Adequacy Tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,790
Bartlett's Test of Sphericity	Approx. Chi-Square	1233,785
	df	210
	Sig.	0,000

the Bartlett's test p value was 0.000. These results confirmed the questionnaire data were acceptable for the continuation of the analysis.

Table 4. Rotated Factor Matrix

	Rotated Factor Matrix[a]				
	Factor				
	1	2	3	4	5
Difficulty reaching the seller	,867				
Difficult consumer rights enforcement	,819				
Long waiting time at replacement	,580				
Expensive sending back process	,499				
Inconvenient warranty enforcement	,477				
Abuse of telephone number		,857			
Abuse of email address		,783			
Abuse of bank card		,696			
Abuse of personal data		,390			
Wrong delivery location			,778		
Product lost at delivery			,737		
Product damaged at delivery			,549		
Long delivery time			,442		
Discrepancy between quality and description				,768	
Lack of product trial				,540	
Difficult judgement of quality				,370	
Counterfeit product					,526

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

An appropriate extraction method is required to identify the factors. The literature and SPSS contain several possibilities for this purpose. In general, Maximum Likelihood or Principal Axis Factoring methods supply the best results, depending on distribution of the underlying data (Osborne, 2014). Some software contains commands to directly execute the multivariate normality distribution analysis. The software used in this study does not directly support such calculations. Therefore, a method described by Arifin was applied, which is a graphical assessment of normality by chi-square versus Mahalanobis distance plot (Arifin, 2015). The assessment indicated the use of the Principal Axis Factoring method to extract the factors.

Unrotated results from a factor analysis are difficult to interpret. To improve the interpretability of the factors, a commonly used rotation method, the Varimax rotation (Osborne, 2014), was chosen. For a clear factor view, factor loadings less than 0.36 were suppressed.

The first analysis was conducted in respect to the communalities. As a result, one item measuring monetary risk and one measuring time risk were removed from the model. In the second round, it was necessary to remove an additional monetary risk item and one product risk from the model. Removing these items resulted in increased KMO statistics. Table 4 displays the factor structure following these steps.

The variance contributions are shown in Table 9. The five risk factors explain 52.4% of the variance in the analysed data.

Once this acceptable structure was in place, reliability analysis was conducted. Reliability analysis results showed that Cronbach Alpha coefficients were satisfactory for factor 1 (=0.805), factor 2 (=0.824), and factor 3 (=0.788). Factor 4, containing product risk items, had a relatively low reliability value of 0.583. Factor 5 had only one item. The KMO statistic (=0.806) of the final model has a ´meritorious value´ (Field 2012).

Table 5. Variance contributions

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,144	30,258	30,258	4,735	27,852	27,852	2,625	15,442	15,442
2	2,01	11,821	42,079	1,606	9,446	37,298	2,196	12,920	28,362
3	1,585	9,323	51,402	1,223	7,197	44,495	1,774	10,434	38,796
4	1,305	7,679	59,081	0,812	4,779	49,274	1,389	8,172	46,968
5	1,132	6,661	65,742	0,535	3,146	52,421	0,927	5,453	52,421

Results

The structure of the rotated factor matrix shows a clear picture of the latent risk factors. Factor 1 contains the items connected with after-sales concerns of consumers. It includes the items in respect of the difficulties with reaching the vendor; the enforcement of legal provisions; the additional costs of returning the purchased good and the long waiting time in case of replacement. Factor 2 includes the items in connection with the loss of personal information, e.g. the telephone number, the email address, the bank card information and any other personal data. Factor 3 shows the perceived risk items resulting from an inappropriate delivery process, e.g. wrong delivery place, lost products and long delivery time. The item "product damaged at delivery" correlates with the delivery risk factor and with the counterfeit product factor. Thematically, this item is related to delivery process; this is the reason why this item is connected to factor 3 in the model interpretation. Factor 4 represents the items linked to risk in connection with the product attributes: the discrepancy between the described and personally perceived quality of the product; the missing possibility of trying the product and the difficulty of measuring the quality via Internet. Factor 5 represents the "counterfeit product" item.

Findings

The EFA results revealed two findings. *First, t*ime risk items were linked to the underlying online purchase processes (to the delivery and after-sales processes). Respondents perceived the items measuring the time aspect as part of the underlying processes and not as a separate "time" risk factor.

Second, the "counterfeit product" risk dimension did not become part of the financial factor model as it did for example in the survey of Zhang et al. in 2012. Additionally, this item does not correlate with any other analysed risk items. Consumers struggle to assess product originality. Nevertheless, this is a decidedly important product characteristic, especially if the product is a special and expensive brand. This issue seems to matter to Hungarian respondents particularly. This concern is not only a Hungarian topic. There is a rising number of internationally developed methods and patents to fight the selling of counterfeit products, e.g. Blockchain-based applications for product anti-counterfeiting (Ma, Li, Chen, X., Sun, Chen, Y. & Wang, 2016), or use

of authentication keys and authentication server (US Patent US10558979B2, 2020).

Conclusions

The study results demonstrated that Hungarian consumers do perceive risks with online shopping. Hungarian consumers are especially worried about the possibility of being unable to contact the seller after purchase and not-receiving the expected after-sales service from the seller. Data security concerns of the respondents are followed by the potential problems at delivery process. Difficulty in assessing product quality online is another factor on which Hungarian consumers focus. The perception of some risks is unambiguously connected to the underlying processes (e.g. time risk to delivery and after-sales processes). The risk of purchasing a counterfeit product is one of the most striking concerns of Hungarian respondents. Consumer attitudes toward risks could be used as a segmentation dimension in Segmentation-Targeting-Positioning (STP) marketing attempt. Furthermore, it would help to further sharpen the focus on the worries of online costumers which could help to adequately design the marketing communication mix and to increase the individual´s shopping intensity.

Lessons learned from the research include: the analysis of perceived risk could be divided into product categories; the number of risk items per hypothesized risk could be augmented; health risk could be included into the risk items; dependence of risk perception and buying willingness/trust/ etc. could be analysed; risk reducing strategies could be included into the research design for enhancing the practical usage of the study. After identification of the risks in the different purchase processes, the two-component model of Cunningham (1967) can be followed as well (where the perceived risk items are conceptualized as the uncertainty {probability of loss} and the consequences {importance of the possible negative consequence} of the purchase).

Extraordinary situations like the current COVID-19 pandemic can hypothetically induce changes in risk perceptions in online shopping. With the development of the online purchasing community and the increasing number of people joining this community, it is expected that risks will be revealed and that sellers or regulators will work to reduce these risks to an acceptable (minimal) level.

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Tveganje pri spletnem nakupovanju, zaznano s strani potrošnikov: izkušnje Madžarske

Izvleček

Cilj prispevka je identifikacija in kategorizacija tveganj, ki so jih zaznali madžarski potrošniki v povezavi s spletnim nakupovanjem. Raziskava temelji na empiričnih podatkih, zbranih s pomočjo vprašalnika in analiziranih z uporabo programa za statistično analizo. Pojasnjevalna faktorska analiza je identificirala pet kategorij tveganj, povezanih s spletnim nakupovanjem: zaznano poprodajno tveganje, zaznano tveganje glede varnosti podatkov, zaznano tveganje glede dostave in zaznano tveganje glede izdelka. Peti dejavnik tveganja se zdi najbolj značilen za madžarske kupce, ki jih skrbi, da spletni trgovci prodajajo ponarejene izdelke na internetu. Rezultati nudijo dragocene informacije podjetjem, ki se ukvarjajo s spletno prodajo, glede dejavnikov tveganja, ki jih madžarski kupci povezujejo s spletnim nakupovanjem. Omejitev te študije je, da ne vrednoti strategij za zmanjšanje tveganja.

Ključne besede: zaznano tveganje, zaznane vrste tveganj, spletno nakupovanje, nakupno vedenje potrošnikov, pojasnjevalna faktorska analiza