PERCEIVED BARRIERS TO E-COMMERCE: EMPIRICAL EVIDENCE FROM EU COUNTRIES*

Vanja Šimičević[1, **], Božidar Jaković[2] and Josip Ježovita[1]

[1]Department of Sociology, Centre for Croatian Studies – University of Zagreb
 Zagreb, Croatia

[2]Department of Informatics, Faculty of Economics and Business – University of Zagreb
 Zagreb, Croatia

ABSTRACT

Internet usage is growing rapidly among the world. Furthermore, Internet usage is widely accepted among EU countries' citizens. In this paper intend is to research to what extent Internet sales by individuals is influenced by the barriers people perceive to buying/ordering over the Internet, using of Internet, and level of computer/Internet skills them posses. A data source for that research Eurostat database will be used. For investigating the research question the multiple linear regression models will be applied. As dependent variable percentage of individuals who used Internet for buying goods and/or services within last 3 months will be used. As independent variables following will be used: (1) perceived barriers are used for analysis, (2) level of computer skills, (3) level of Internet skills, and (4) level of Internet usage. The percentage of the individuals who bought goods/services over the Internet within last 3 months and factors: giving personal details over the Internet, level of necessary computer usage skills, and lack of necessary computer usage skills have been found to be statistically significant. In this research both hypotheses can be accepted, thus confirming that buying over the Internet in EU countries is influenced both by the level of individuals' skills and the level of perceived barriers.

KEY WORDS
e-commerce, online sale, internet, European Union, regression analysis

CLASSIFICATION
JEL: D83, L81, L86, M15, O33

INTRODUCTION

The Internet is causing significant changes in the business models in all of the industry sectors and all of the business aspects. Although at the beginning of Internet usage (middle 90s), firms were less likely to implement Internet as a sales channel [1, 2], and customers were less likely to buy goods over the Internet. Within the last decade Internet sales have become widely accepted business model in many fields [3, 4]. Many researches have investigated the barriers to buying over the Internet [5, 6]. The aim of this paper is to research to what extent Internet sales by individuals from EU countries is influenced by the perceived barriers, computer skills, Internet skills and level of Internet usage.

In first part of the paper literature overview will be shown, stating the main research topics on information and communication technology, as well on e-commerce. After that the research methodology will be described. Main part of this paper is the paragraph which describes the research results. And finally, there will be brief discussion and conclusion.

LITERATURE OVERVIEW

Role of information and communication technology in business and society increased every day, especially with development of e-commerce. Continuity of technological changes as well as the constant and fast improvement of the quality of ICT products stimulates further development and diffusion of ICT [7]. ICT adoption will further facilitate service quality, service delivery and cost reduction [8]. Furthermore, information and communication technology (ICT) has had an effect on instructional activities in the teaching process, changed the way students learn and had an impact on school as a physical learning environment [9]. It is indisputable that information and communication technology (ICT) has an enormous effect on contemporary business [10].

Li and Xie developed a framework that incorporates factors determining firms' adoption of e-commerce. In their paper they summarized ten factors which determine firms' adoption of e-commerce. Four significant factors were especially highlighted, including managerial attitudes, corporate strategies, external pressures and firms' technology strengths [11]. Doherty and Ellis-Chadwick study's endings suggest that the scope of the retailers' e-commerce strategies is strongly associated with the strength of management support behind the strategy and its perceived strategic fit. The perceived success of their strategies is most strongly associated with the degree to which the retailer has deployed a portfolio of appropriate resources and capabilities, in support of its online operations [12].

Abbad et al. in their paper try to clarify the status of e-commerce in terms of limitations, problems and barriers facing the application and use of e-commerce in Jordan. They found six main limitations of e-commerce: security and trust; Internet experience; enjoyment; language; legal issues; and technology acceptance (ease of use and usefulness).The results of their research showed that the main limitations of e-commerce in Jordan appeared to be related to non-technical limitations. The reason behind this result could be related to the lack of students' awareness of technical issues, in that they might not have known about the technical issues that could face e-commerce [13].

Ghobakhloo et al. examine the factors within the technology-organization-environment (TOE) framework that affect the decision to adopt electronic commerce (EC) and extent of EC adoption, as well as adoption and non-adoption of different EC applications within small- and medium-sized enterprises (SMEs). They find out that e-commerce adoption within SMEs is affected by perceived relative advantage, perceived compatibility, CEO's innovativeness,

information intensity, buyer/supplier pressure, support from technology vendors, and competition [14]. Technological competence has a positive effect on performance. Firms perceive enhanced performance if they are well equipped in IT, when they have available infrastructure, and when they employ professionals with the necessary knowledge and skills to conduct the activities required [15]. Perceived usefulness related to the online price policies and online product policies, the perceived safety and, therefore, the trust in online commerce sites, seems to correlate with a higher purchase intention than the elements of usability or ease of use in the development of an e-commerce marketing project and web design [16]. Online purchase intention and repeat purchase intention depend on such factors as perceived risk, a risk which in an online context might be due to the purchaser's inability to directly value product quality, the lack of personal contact with sellers, the cost of learning how to use the internet and change of channel, or the absence of any personal interaction with other buyers [17].

Weisberg et al. in their study investigate the relationship between past online purchases and purchasing intentions, representing the social context by the notions of social presence and trust. They find out that past purchasing predicts intentions to purchase and that trust and social presence act as partial mediators [18].

Oh et al. in their paper try to establish the obstacles and the perceived barriers to the continuing use of e-trade technologies by small Korean firms. They found that information risk and business risk negatively affect adoption and use. They also tested the relationship between the environment of the organization and adoption of e-trade. The results show that the maturity of information technology and the innovation characteristics of the firm have positive influences on the adoption of e-trade [19].

On the base of this founding we define expectations related with results of this research: (1) Hypothesis 1: Buying over the Internet is influenced by the level of individuals' skills; (2) Hypothesis 2: Buying over the Internet is influenced by the level of perceived barriers to buying/ordering over the Internet.

METHODOLOGY

Eurostat database is used as a source for information for the research within the chapter of Information-Communication Technology. Data is collected according to the Eurostat model for the Community Survey on ICT usage in households and by individuals 2009 [10]. Multiple linear regression model is used for testing the hypothesis of this work. As dependent variable percentage of individuals who used Internet for buying goods and/or services within last 3 months is used. As independent variables following are used: (1) perceived barriers are used for analysis (No need; Relevant information about goods and services difficult to find on website; Lack the necessary skills; It's too expensive; Too long delivery times; Problematic to receive the ordered goods at home; Worried about giving personal details over the Internet; Worried about giving credit card or personal details over the Internet; Speed of the Internet connection is too low); (2) level of computer skills (Individuals who have used a mouse to launch programs such as an Internet browser or word processor); (3) level of Internet skills (Individuals who have used a search engine to find information), and (4) level of Internet usage (Individuals who used Internet within last 12 months).

RESULTS

Number of On-line shoppers is increasing constantly. The reasons are in the increase of Internet users, the rich offer of wide range of products and services over the high-quality designed web-sites and increasing percentage of females shopping on-line. The habits of

using Internet and related skills were investigated by the calculating descriptive statistics (mean and standard deviation). The same analysis was conducted for perceived barriers to buying/ordering over the Internet and made their last online purchase within last three months. The average percentage of individuals who bought over the Internet over the last 3 months, with basic computer skills, with basic Internet skills, and who used Internet over the last 12 months are presented in Table 1. Table 2. presents average percentage of individuals who perceive barriers for buying/ordering goods over the Internet. The largest perceived barriers to buying/ordering over the Internet are worries about giving personal details over the Internet (22,8 %) and lack of the necessary skills (21,7 %).

Pearson correlation coefficients between buying over the Internet over the last 3 months and other factors examined are presented in Table 3.

As expected, perceived barriers influence percentage of individuals that bought goods/services over the Internet over the last 3 months in negative manner, but only three of the barriers have found to be statistically significant (No need, Lack of the necessary skills, Worried about giving personal details over the Internet).

According to the results of correlation analysis there is a positive correlation between percentage of individuals that bought goods/services over the Internet over the last 3 months and level of computer skills, level of Internet skills and Internet usage over the last 12 months.

In order to explain buying over the Internet by the perceived barriers and level of knowledge (computer and Internet skills), and Internet usage, multiple regression model was designed with the percentage of employees that bought goods over the Internet over the last 3 months as dependent variable. Results are presented in the Table 4. where estimated values for regression parameters are presented with p-values in the parenthesis.

The data fit the model rather well (Adjusted R-Squared = 0,936), what indicates highly representative regression model and two parameter estimates for the perceived barriers to buying/ordering over the Internet (Worried about giving personal details over the Internet,

Table 1. Habits of using internet and related skills.

Habits of Using Internet and Related Skills	Mean	Stand. dev.
Percentage of individuals who bought over the Internet over the last 3 months	25,0	18,4
Percentage of individuals with basic computer skills	64,0	18,4
Percentage of individuals with basic Internet skills	58,0	16,7
Percentage of individuals who used Internet over the last 12 months	64,6	17,2

Source: Authors' research

Table 2. Perceived barriers to buying/ordering over the internet.

Perceived barriers to buying/ordering over the Internet	Mean	Stand. dev.
No need	5,0	3,4
Relevant information about goods and services difficult to find on website	3,2	3,2
Lack the necessary skills	21,7	11,0
It is too expensive	3,9	2,8
Too long delivery times	10,3	6,8
Problematic to receive the ordered goods at home	11,6	7,0
Worried about giving personal details over the Internet	22,8	9,7
Worried about giving credit card or personal details over the Internet	5,6	2,9
Speed of the Internet connection is too low	3,7	3,5

Source: Authors' research

Table 3. Pearson correlation coefficients between variables buying over the internet over the last months months and other factors examined.

Variables	Pearson correlation	Significance (two-tailed)
No need	–0,540**	0,003
Relevant information about goods and services difficult to find on website	–0,121	0,549
Lack the necessary skills	–0,610**	0,000
It is too expensive	0,028	0,887
Too long delivery times	–0,182	0,336
Problematic to receive the ordered goods at home	–0,107	0,574
Worried about giving personal details over the Internet	–0,532**	0,002
Worried about giving credit card or personal details over the Internet	–0,120	0,537
Speed of the Internet connection is too low	–0,223	0,264
Percentage of individuals with basic computer skills	0,865**	0,000
Percentage of individuals with basic Internet skills	0,835**	0,000
Percentage of individuals who used Internet over the last 12 months	0,881**	0,000

*Correlation is significant at the 0,05 level (2-tailed)
**Correlation is significant at the 0,01 level (2-tailed)
Source: Authors' research

Lack the necessary skills) are statistically significant at 1 % level. Level of computer skills is also found to be statistically significant at 1 % level.

Impact of the perceived barriers that are found to be statistically significant is negative, while the impact of the computer skills is found to be positive. Those results confirm the research of the [5] that stress the influence of the perceived risk and the consumer buying process of Internet airline reservations. Similar conclusions have been found by [3]. Trust is a factor that is significantly more important to adoption of the e-commerce [21].

Table 4. Results of linear regression model.

Variable	Regression coefficients
Constant	2,048
No need	–0,381
Relevant information about goods and services difficult to find on website	0,289
Lack the necessary skills	–0,382**
It is too expensive	0,000
Too long delivery times	–0,485
Problematic to receive the ordered goods at home	0,741
Worried about giving personal details over the Internet	–0,667**
Worried about giving credit card or personal details over the Internet	0,686
Speed of the Internet connection is too low	0,373
Percentage of individuals with basic computer skills	0,092
Percentage of individuals with basic Internet skills	–0,431
Percentage of indivduals who used Internet over the last 12 monhts	1,119**
Adjusted R-square	0,936

**Statistically significant at 1 % level
Source: Authors' research

DISCUSSION AND CONCLUSIONS

The analysis of e-customer behavior is a key issue for the development of e-retailing. Better knowledge about the evolution of consumer behavior allows a better management of the e-customer – firm relationship (e-business). Firms should bear in mind the relevant perceptions of e-customers for each decision [22].

In this paper we investigate individuals who used Internet for buying goods and/or services within last 3 months is used and perceived barriers, computer skills, Internet skills and level of Internet usage. According to the results of correlation analysis there is a positive correlation between percentage of individuals that bought goods/services over the Internet over the last 3 months and level of computer skills, level of Internet skills and Internet usage over the last 12 months.

Government agencies and public bodies of EU countries should encourage all forms of education, especially the development of various computer and Internet skills. Legislation and regulations should allow access to ICT infrastructure at the lowest possible prices to all residents. Furthermore, they should encourage and educate residents how to use all resources that ICT infrastructure provides in order to increase the strength of the Internet as sales channel.

Limitation of the study is limited number of barriers. In future analysis new barriers should be investigated as well different type of c-commerce models and Internet buyers should be taken in analysis. Impact of culture could be one of it. There are complex interactions between project environmental cultural traits leading to different trajectories impacting on ICT implementation [23]. Contextual factors have been largely ignored, therefore little is known about the effects of specific types of ICT under different circumstances [10].

E-commerce is growing rapidly, and number of new buyers on Internet is increasing every day. There is still significant influence of the perceived barriers for the e-commerce, and the level of computer/Internet skills. Multiple linear regression model was used for the analysis and relationships have been found to be statistically significant for the percentage of the individuals who bought goods/services over the Internet within last 3 months: Worried about giving personal details over the Internet, Lack the necessary skills, Level of computer skills. Results show that usage of Internet did not have statistically significant influence, reason for that probably is wide use of Internet. In this research both hypotheses can be accepted, thus confirming that buying over the Internet in EU countries is influenced both by the level of individuals' skills and the level of perceived barriers.

REFERENCES

[1] Palmer, J.W. and Griffith, D.: *An emerging model of Web site design for marketing*.
     Communications of the ACM **41**(3), 44-51, 1998,
     http://dx.doi.org/10.1145/272287.272296,
[2] Šimičević, V.: *Internet sales diffusion determinants: Empirical evidence from EU countires*.
     In Katalinić, B., ed.: Annals of DAAAM for 2011 & Proceedings of the 22nd International
     DAAAM Symposium. DAAAM International, Vienna, pp. 405-406, 2011,
[3] Cheng, J.M.S.; Sheen, G.J. and Lou, G.C.: *Consumer acceptance of the Internet as a channel function perspective*.
     Technovation **26**(7), 753–894, 2006,
     http://dx.doi.org/10.1016/j.technovation.2005.01.001,
[4] Ruiz- Mafé, C.; Sanz-Blas, S. and Aldás-Manzano, J.: *Drivers and barriers to online airline ticket purchasing*.
     Journal of Air Transport Management **15**(1), 294-298, 2009,

[5] Cunningham, L.F.; Gerlach, J.H.; Harper, M.D. and Young C.E.: *Perceived risk and the consumer buying process: Internet airline reservations*.
International Journal of Service Industry Management **16**(4), 357–372, 2005,
http://dx.doi.org/10.1108/09564230510614004,

[6] Davis, F.D.: *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology*.
MIS Quarterly **13**(3), 319-340, 1989,
http://dx.doi.org/10.2307/249008,

[7] Rojko, K.; Lesjak, D. and Vehovar, V.: *Information communication technology spending in (2008-) economic crisis*.
Industrial Management & Data Systems **111**(3), 391-409, 2011,
http://dx.doi.org/10.1108/02635571111118279,

[8] Kagaari, J.R.K.; Munene, J.C. and Ntayi, J.M.: *Performance management practices, information and communication technology (ICT) adoption and managed performance*.
Quality Assurance in Education **18**(2), 106-125, 2010,
http://dx.doi.org/10.1108/09684881011035330,

[9] Sipilä, K.: *No pain, no gain? Teachers implementing ICT in instruction*.
Interactive Technology and Smart Education **8**(1), 39-51, 2011,
http://dx.doi.org/10.1108/17415651111125504,

[10] Zhang, X.; Donk, D.P. and Vaart, T.: *Does ICT influence supply chain management and performance?: A review of survey-based research*.
International Journal of Operations & Production Management **31**(11), 1215-1247, 2011,
http://dx.doi.org/10.1108/01443571111178501,

[11] Li, P. and Xie, W.: *A strategic framework for determining e-commerce adoption*.
Journal of Technology Management in China **7**(1) 22-35, 2012,
http://dx.doi.org/10.1108/17468771211207321,

[12] Doherty, N.F. and Ellis-Chadwick, F.: *Exploring the drivers, scope and perceived success of e-commerce strategies in the UK retail sector*.
European Journal of Marketing **43**(9-10), 1246-1262, 2009,
http://dx.doi.org/10.1108/03090560910976474,

[13] Abbad, M.; Abbad, R. and Saleh, M.: *Limitations of e-commerce in developing countries: Jordan case*.
Education, Business and Society: Contemporary Middle Eastern Issues **4**(4), 280-291, 2011,
http://dx.doi.org/10.1108/17537981111190060,

[14] Ghobakhloo, M.; Arias-Aranda, D. and Benitez-Amado, J.: *Adoption of e-commerce applications in SMEs*.
Industrial Management & Data Systems **111**(8), 1238-1269, 2011,
http://dx.doi.org/10.1108/02635571111170785,

[15] Martín, S.S.; López-Catalán, B. and Ramón-Jerónimo, M.A.: *Factors determining firms' perceived performance of mobile commerce*.
Industrial Management & Data Systems **112**(6), 946-963, 2012,

[16] Bonera, M.: *The propensy of e-commerce usage: the influencing variables*.
Management Research Review **34**(7), 821-837, 2011,
http://dx.doi.org/10.1108/01409171111146706,

[17] Martín, S.S.; Camarero, C. and José, R.S.: *Dual effect of perceived risk on cross-national e-commerce*.
Internet Research **21**(1), 46-66, 2011,
http://dx.doi.org/10.1108/10662241111104875,

[18] Weisberg, W.; Te'eni, D. and Arman, L.: *Past purchase and intention to purchase in e-commerce: The mediation of social presence and trust*.
Internet Research **21**(1), 82-96, 2011,
http://dx.doi.org/10.1108/10662241111104893,

[19] Oh, K-Y.; Anderson, A.R. and Cruickshank, D.: *Perceived barriers towards the use of e-trade processes by Korean SMEs*.
Business Process Management Journal **18**(1), 43-57, 2012,
http://dx.doi.org/10.1108/14637151211215000,

[20] Eurostat: *Community survey on ICT usage in households and by individual*.
http://circa.europa.eu, 2009, accessed 4 March 2011,

[21] Chattaraman, V.; Kwon, W-S.; Gilbert, J.E. and Shim, S.I.: *Virtual agents in e-commerce: representational characteristics for seniors*.
Journal of Research in Interactive Marketing **5**(4), 276-297, 2011,
http://dx.doi.org/10.1108/17505931111191492,

[22] Hernandez, B.; Jimenez, J. and Martín, M.J.: *Adoption vs acceptance of e-commerce: two different decisions*.
European Journal of Marketing **43**(9-10), 1232-1245, 2009,
http://dx.doi.org/10.1108/03090560910976465,

[23] Gajendran, T. and Brewer, G.:*Cultural consciousness and the effective implementation of information and communication technology*.
Construction Innovation: Information, Process, Management **12**(2), 179-197, 2012,
http://dx.doi.org/10.1108/14714171211215930.

PREPREKE ELEKTRONIČKE TRGOVINE: EMPIRIJSKI DOKAZ NA ZEMLJAMA EUROPSKE UNIJE

V. Šimičević[1], B. Jaković[2] i J. Ježovita[1]

[1]Odjel za sociologiju, Hrvatski studiji – Sveučilište u Zagrebu
Zagreb, Hrvatska

[2]Katedra za informatiku, Ekonomski fakultet – Sveučilište u Zagrebu
Zagreb, Hrvatska

SAŽETAK

Gledajući svjetsku razinu korištenje Interneta raste razmjerno brzo. Između ostalih, upotreba Interneta raširena je i među građanima Europske unije. U ovom znanstvenom radu istražuje se u kojoj je mjeri prodaja putem Interneta pojedinaca uvjetovana preprekama koje kupci opažaju prilikom kupnje ili naručivanja putem Interneta, prilikom korištenja Interneta i računalnim i internetskim vještinama koje posjeduju. Kao temelj za istraživanje korištena je Eurostat baza podataka. Nadalje, u istraživanju koriste se model višestruke linearne regresije. Kao zavisna varijabla koristi se postotak pojedinaca koji su koristili Internet za kupovinu proizvoda i/ili usluga u posljednja tri mjeseca. Nezavisne varijable su: (1) opažene prepreke (2) računalne vještine, (3) internetske vještine i (4) razina korištenja Interneta. Utvrđeno je da postotak pojedinaca koji su koristili Internet za kupovinu proizvoda i/ili usluga u posljednja tri mjeseca i čimbenici: objava osobnih podataka na Internetu, razina potrebnih računalnih vještina i nedostatak potrebnih računalnih vještina statistički su značajni uz definiranu razinu signifikantnosti. U ovom radu obje hipoteze mogu se prihvatiti potvrđujući da je kupovina putem Interneta u zemljama Europske unije pod utjecajem razine vještina pojedinaca i razine opaženih prepreka elektroničke trgovine.

KLJUČNE RIJEČI

elektronička trgovina, internetska prodaja, internet, Europska unija, regresijska analiza