

SECURITY CONCERN AND ON-LINE SHOPPING

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Abstract

The paper overviews the relationships between concern for security and on-line shopping. The issues of confidentiality, privacy and credibility are also briefly discussed. Despite some recent turbulence, the on-line shopping is steadily growing, surpassing 1% of retail sales in some most developed countries. Of course, the indirect effect of on-line shopping information is much larger.

Second, the data from SIBIS project for 25 European countries and US are presented with special attention to the relation between e-shopping, security, privacy and Internet developments. The relation between the Internet developments and on-line shopping seems to be strongly linear. However, the security concern, and - in particular - its impact on on-line shopping, exhibit much more complex relation, which is strongly conditioned on specific (cultural) country characteristics. No simple linear correlation can be observed between this concern and the extent of on-line shopping or Internet usage.

More detailed individual data from Slovenia enabled the modeling of the causal relation between security concern and on-line shopping. It is shown, that on individual level the on-line purchase is basically determined by attitudes towards e-shopping and not so much with security concern and the intensity of Internet usage. There are also some important differences if data are used from representative telephone survey, or, from the self-selected survey on the Web.

The specific data on Slovenia are also presented, showing a typical country with modest internet penetration (40% of the population 15+) and relatively slow development of on-line shopping, where the privacy and confidentiality concern did not yet develop to the extent that would present a serious obstacle. However, the consumer attitudes reveal some surprising issues. Thus, for example, the navigation of the on-line shop seems to be the most important characteristic of a good shopping Web site (before security and privacy assurance). Similarly, among the complaints related to the consumer rights the most exposed one was the problem that the Web site was not enough user-friendly.

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1 INTRODUCTION

Despite serious turbulences in recent years that caused substantial shrinking of the information technology sector (and particularly in the so-called dotcom industry) the electronic commerce is steadily growing. Of course, the brave five-year forecasts of consulting agencies from mid 90's did not come true. Similarly, many visions of digital society, from Being Digital (Negroponte, 1990), Third Wave (to What Will Be (Dertousoz, 1995) become somehow more remote. However, there still exists an increasing integration of the information and communication technologies (ICT) into the life of the citizens as well as into the business practice of companies.

In this paper we basically focus on specific aspect of electronic commerce. We thus discuss the on-line purchase, which is also covered with the term of B2C (Business to Customer) e-commerce. Here, the relations among some key important underlying concepts (e.g. electronic commerce, electronic business, internet shopping, on-line shopping, on-line purchase, etc) are often very complex, overlapping and sometimes also confusing. As our focus here is very specific, we will omit the more general discussion of these concepts and focus immediately on the empirical evidences.

Thus, let us start with the latest release of the U. S. Census Bureau of the Department of Commerce, which publish quarterly estimates on-line retail. The recent estimate of the U.S. retail e-Commerce sales for the first quarter of 2003 was \$11.921 billion, an increase of 26 percent from the first quarter of 2002. Therefore, e-Commerce sales in U.S. in the first quarter

of 2003 already accounted for 1.5 percent of total retail sales¹. An economic phenomena that exhibit 25% annual growth is no doubt rapidly expanding, however, this is still a dramatic slow down from early years of internet adoption when annual rates were above 100%. The current annual growth of 25% is thus still extremely large, however, we now face a relatively predictable growth, which means that for a doubling at least 3-4 years are needed.

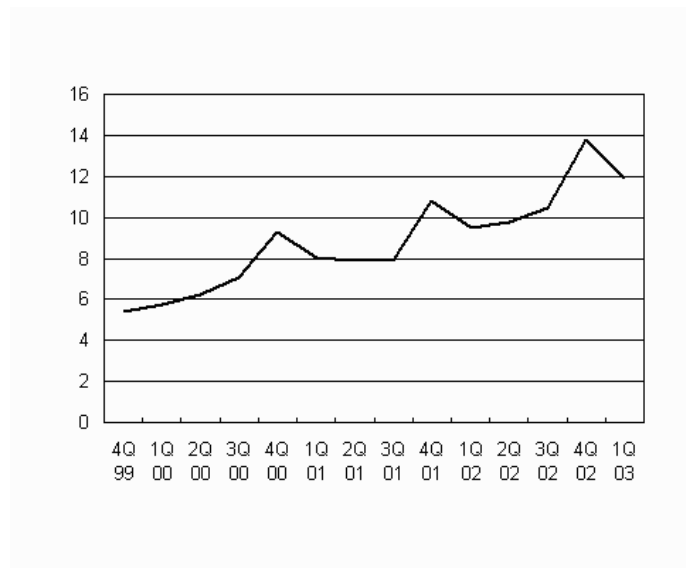


Figure 1: Quarterly U.S. On-line Retail Sales in Mio USD: Total and E-commerce (Surce: US Censu Bureau)

Here, we should add that within the framework of existing technology, the expert estimates of the potential of on-line retail is typicall limited with 10% of the total retail. However, with additional and unforeseen technological changes (multimedia, broadban, mobile,...) this limit may radically change.

We found the U.S: Census Bureau definition operational enough, so that we do not elaborate the definitional issue in further details. According to Census Bureau, the On-line (or e-Commerce retail sales) are the sales of goods and services that correspond to the orders placed by the buyers on-line, or, by the prices and terms of sale are negotiated on-line. Here, the “on-

¹ <http://www.census.gov/mrts/www/current.html>

line” notion includes Internet, Extranet, Electronic Data Interchange (EDI), electronic mail, or other on-line system. We should add that the above definition exclude the on-line gambling and on-line sex industry as well as the on-line travel *to sem že zadnjič napisal da preverite*!!!

Payment may or may not be made online as seen² in the Figure 2. In order for electronic transactions to take place, it is thus necessary only that at least the ordering step is carried out (SIBIS, E-Commerce, 2002: 8), what creates another characteristics for further structuring of on-line saels (in Slovenia, for example, only 20% of on-line orders are also paid on-line),

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Figure 2: The matrix of the definition of electronic commerce

In addition, we should recall, that the customers may use the Internet only to collect the information, but actual purchase may be performed off line. Let us illustrate this simple fact with a table of rough estimates for Slovenia, where the on-line retail is still only in the early stage of development. We can thus observe that the on-line retail has a very minor share (0.2% compared to 1.5% in US) in the total retail, however, the much larger share is contributed to the off-line purchase generated with on-line information gathering. These all, of course, pose many question to the definition and the scope of the B2C electronic commerce.

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Figure 3: The on/offline information gathered and on/offline order – the estimates for the total retail sales

² ibid.

From the consumer point of view, the on-line purchase is heavily linked with the issues of credibility, security, privacy and confidentiality. While the credibility affect also the use of on-line information for the corresponding on-line and off-line purchase, the concern for privacy, confidentiality and security basically relates only to the on-line purchase. Let us briefly introduce these four notions:

- One of the most common worries with creating efficient and trustworthy on-line commerce concerns the *security* of financial transactions which occurs over the network (Palubo and Herbig, 1998: 258). The concerns are not merely about security of value, but also about the trust in information society (Udo, 2001: 165).
- *Credibility* on the web is closely connected to the process of gathering online information, which should be accurate, comprehensive, based on expert opinion, and comprehensive³. Further on, when using websites to obtain information consumers are often asked to divulge personal information.
- The disclosure of identity of consumers is usually a *privacy* issue obstacle when shopping online. The Privacy@net⁴ study revealed that far too many sites collect personal information from consumers without providing adequate protection of that information. The latest Consumers International research on web credibility emerged that 39 percent of sites that collected personal information did not have a privacy policy⁵.
- Confidentiality

**dodati bolj precizne definicije the pojmov Matej

³ Consumers international, 2002, Credibility on the web, international study of the credibility of consumer information on the internet.

⁴ Consumers International, 2001

⁵ Consumers International's "Credibility on the web" study

In this paper we will basically deal with the confidentiality....***

2 ON-LINE SHOPPING AND CONFIDENTIALITY CONCERN: SIBIS DATA

We will illustrate some of the above concepts with the latest findings of the SIBIS project (Statistical Indicators Benchmarking the Information Society), funded by the European Commission under the 'Information Society Technology' FP5 Programme, running from January 2001 to June 2003. Within the SIBIS project a General Population Survey (n=1,000 per country) was conducted in 2002/2003. There, the comparisons of 10 EU accession countries (January 2003) are available with EU-15 countries and also with Switzerland and the USA (June 2002).

SIBIS indicators focus on e-commerce and on barriers related to security problems for consumers. The indicators usually explore the causality link between the perception of security problems and the decision to buy online, confirming that the link is rather strong. We are presenting here the results of the research on e-Commerce and security/privacy concerns.

2.1 On-line purchases over the Internet

On average, 20% of the EU's population (15 years and more) purchase products online. Here, the term "e-commerce" relate to any *dajte question wording... Among the candidate countries, only Estonia comes close to this figure. Some more advanced candidate countries are on a comparable level with less developed EU15 countries (Spain, Greece and Portugal), with the majority falling radically behind. Buyers tend to display a more interactive use on the PC, suggesting more sophisticated and pioneer Internet users purchase online. Even so, occasional users are representing an increasing proportion of e-Commerce users, especially in those countries with increasing online tenure and experience.

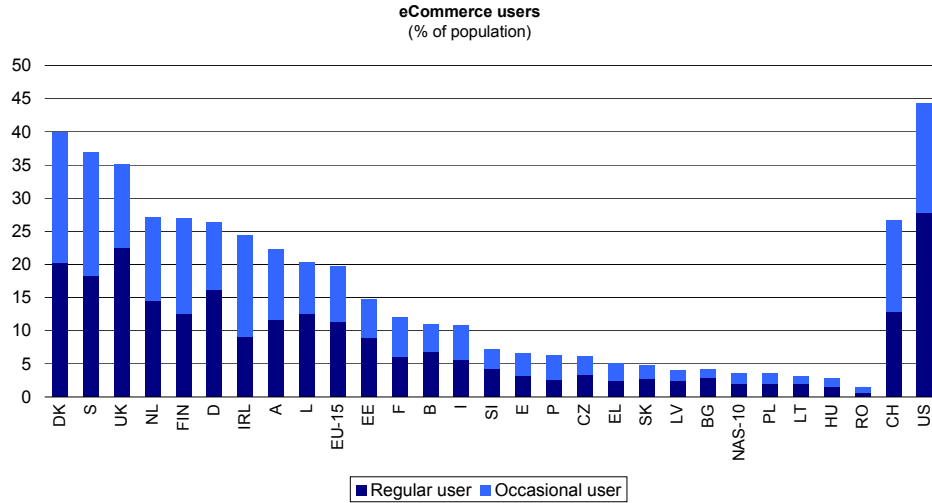


Figure 4: E-Commerce users, SIBIS GPS 2002, SIBIS GPS-NAS 2003

The figure below shows that the percentage of e-commerce usage is linearly growing with the Internet penetration.

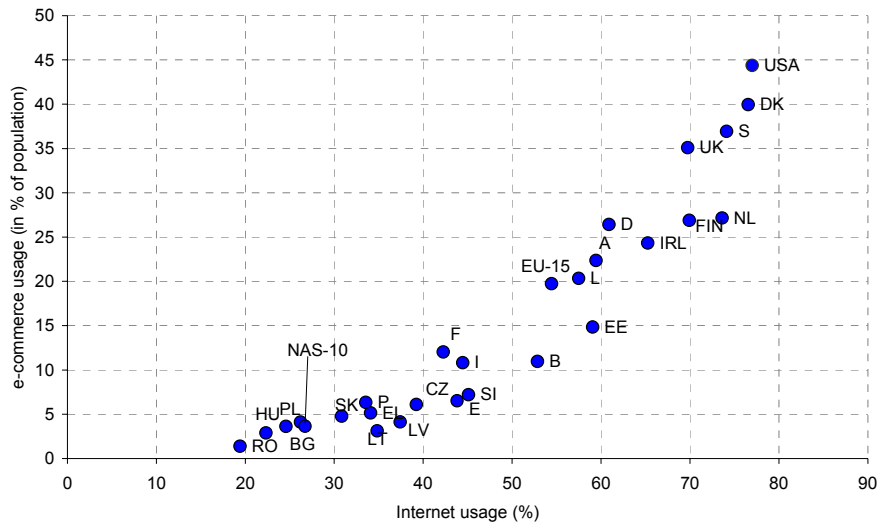


Figure 5: E-commerce usage and internet usage, SIBIS 2002, GPS, SIBIS 2003, GPS-NAS

One of the most dynamic groups of e-Commerce users is the 25-49 age class. They represent a driving force of e-Commerce users across the EU. In the EU, this age group (28% of it are e-Commerce users) is by now as or more likely to be e-Commerce users than the Internet

pioneering younger age group (25%). Only about 5% in the majority of the NAS countries are e-Commerce users at all. Here as well, the most important market segment is the 25-49 age group. And the same trend is to be noticed among US e-Commerce users. *nejasno cel odstavek

The length of online usage and experience, or online tenure, is a critical aspect for the development of e-Commerce. The SIBIS survey shows that at least two years experience is required to be a more adept e-Commerce participant. SIBIS revealed that almost one sixth of the EU-15 could be classified as having significant online tenure, although this is somewhat behind the US. Conversely, many NAS have limited online tenure, although Estonia and Slovenia have encouraging profiles. Online tenure also has implications for the goal of increased broadband, as SIBIS analysis showed more experienced users tend to migrate to faster Internet connections.

2.2 Security concern as the obstacle of on-line shopping behaviour

Information security is increasingly recognised as vital element for ensuring wide participation in the Information Society. The success of the Information Society depends upon trust and confidence in our information infrastructures. Within this context, the effects of real (or perceived) security problems inhibit the development of the Information Society and of e-Commerce as a whole.

Consumers are generally concerned both about privacy/confidentiality and data security. Privacy is the basis of human dignity and other human rights and values, like freedom of joining and freedom of speech. Some authors of liberal tradition even claim that all human

rights are some aspects of right to privacy. Privacy is one of the most important rights in contemporary west society, as found in Privacy & Human Rights 1999 report.⁶

Threats to privacy increased in seventies with emerge of information and communication technology. As found in Privacy & Human Rights 1999 report, privacy is today threatened mostly by three important trends: *globalisation* (removes geographical restrictions in flow of data), *convergence* among technologies and *multi-media*.⁷

Privacy is not one-dimensional concept, and different aspects of privacy are threatened different way. The most endangered in contemporary society are especially information privacy (possibility that individual keeps information about himself private) and privacy of communications, which also includes data transactions.

SIBIS 2002 Topic report on Security and trust shows there seems to be a fairly equal distribution between those who declare themselves to be strongly, somewhat or not affected at all by their security and privacy concerns. The data indicates that improved security functionalities by on-line operators foster electronic commerce. This clearly emerges from the high degree of respondents admitting that their concerns have an impact on their choices in this area. However, other factors should also be assessed. There are a large number of respondents who do not seem to be affected by electronic breaches or vulnerabilities. A possible explanation is that these respondents are more aware of e-commerce security features and, consequently, are more confident in completing on-line transactions.

⁶ Privacy & Human Rights 1999, <http://www.privacyinternational.org/survey/Overview.html>, May, 23 2000.

⁷ *ibid.*

However, on the whole, the value SIBIS adds in this area is to enhance the realisation that better security will not be the panacea for the success of electronic commerce. Security needs to be considered as part of a set of activities or initiatives aimed at fostering a “customer oriented society”, which is based on consumers’ needs and wants. It is in particular the lack of trust that seems to hold consumers back from shopping at the electronic marketplace.

Concerns (particularly on privacy) seem to be lower in continental EU Member States and especially in most of the NAS countries – with Hungary as the lowest – than in the UK, Ireland or the US. The clear outsider from the general NAS tendency is Poland, where the share of Internet users stating they are “very” or “somewhat concerned” about data being mistreated is the highest of all countries. Differences between countries are likely to be caused by a large number of factors including the amount of negative experiences, the level of trust in the state and the functioning of society-at-large, and the level of awareness of issues surrounding data protection and privacy. Nevertheless, despite these differences, there exist a high correlation between the privacy concern and security concern.

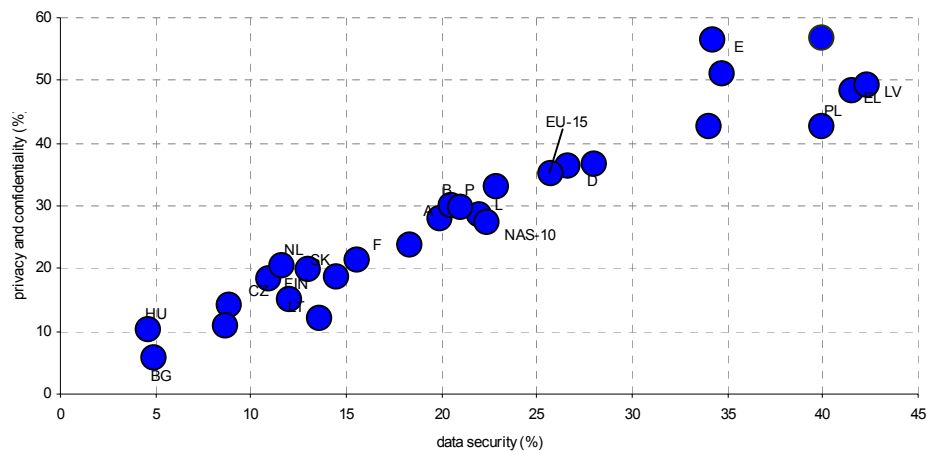


Figure 6: Concerns regarding on-line security, SIBIS GPS 2002, SIBIS GPS-NAS 2003 *label

The figure below shows that the privacy and confidentiality concern does not necessarily grows with the internet penetration. In Nordic counties the concern is low in spite of high penetration. In NAS 10 countries the penetration and the concern meets at around 30%. Obviously, there exist other (i.e. cultural) factors. We do not show the relation among security concern and internet usage, as we saw from the picture above, that the correlation security-privacy is very high

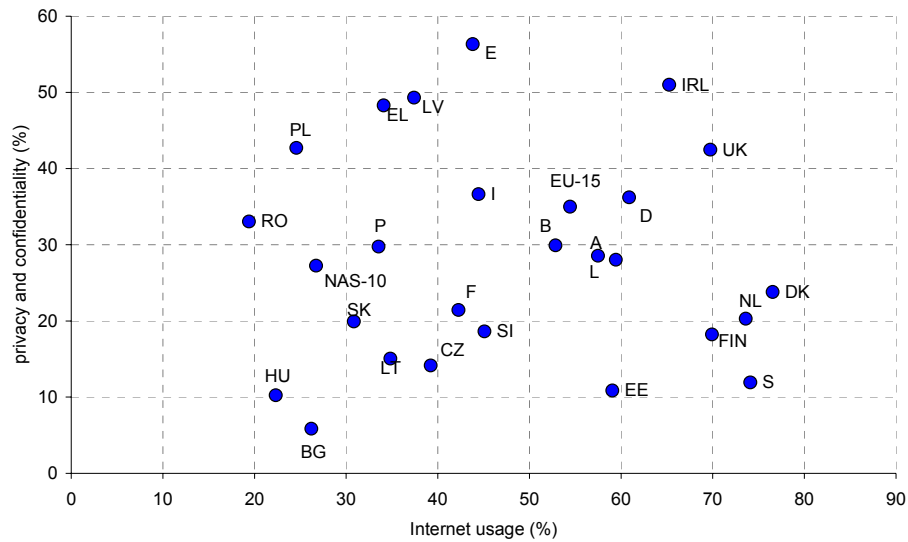


Figure 7: Privacy and confidentiality concern and internet usage, SIBIS GPS 2002, SIBIS GPS-NAS 2003

2.3 Privacy and security concern and on-line shopping

Security concerns have a significant impact on online shopping behaviour of European and US citizens. The figure below shows that the usage of e-Commerce is lower in countries where the privacy and confidentiality issues are larger. This is especially true for NAS countries. The privacy concerns are high also in USA and UK where e-commerce penetration is nearly 50%. It is somehow surprising that the concern seem not to correlate with on-line shopping, although we can expect this already form the previous figure (concern and Internet

usage). However, we could say that exist a trend among EU-15 countries, if we exclude Scandinavian countries, while with NAS 10 countries there seem to be no correlation.

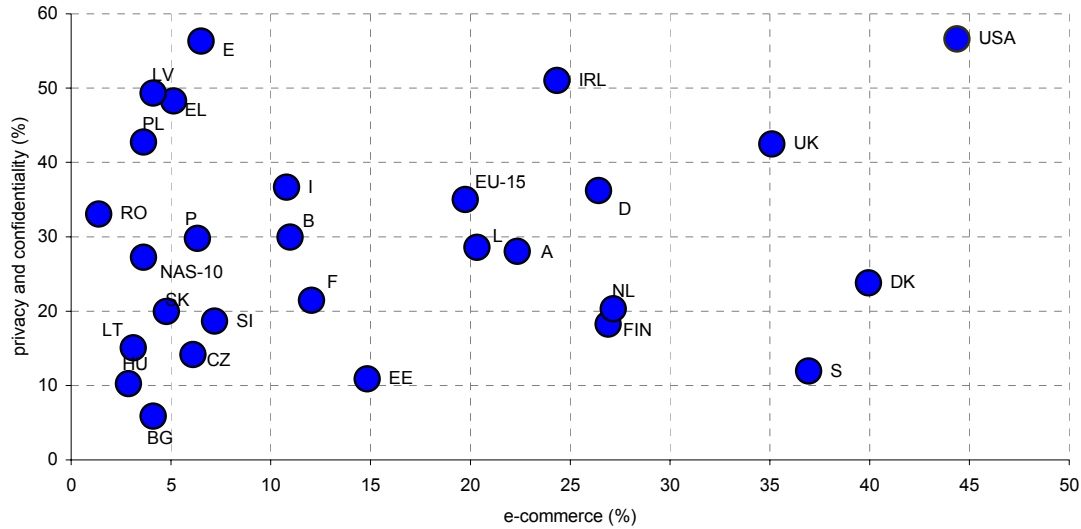


Figure 8: Privacy and confidentiality concern and e-commerce, SIBIS GPS 2002, SIBIS GPS-NAS 2003

We get more insight if we observe the customers stopped from on-line buying due to security concerns. In the EU, on average, nearly a third of Internet users do not buy online due to security concerns. However, evidence suggests that there is a clear split between "front-runners", where online shopping usage is high and the impact of security concerns is relatively low (quadrant I) and the "laggards", where online shopping usage is low and the impact of security concerns is strong (quadrant III). As can be seen, the Nordic countries, the US, the UK, Austria and Germany appear as front-runners, while all Mediterranean countries (France, Italy, Spain and Greece) are the laggards. In comparison, all of the Central and East European candidate countries are located in the quadrant II, which means low online shopping usage and relatively rarely kept from online shopping. This may be caused by lower usage of online shopping and less possibilities for e-Commerce in these countries. On the other hand the lowest percentage of the users

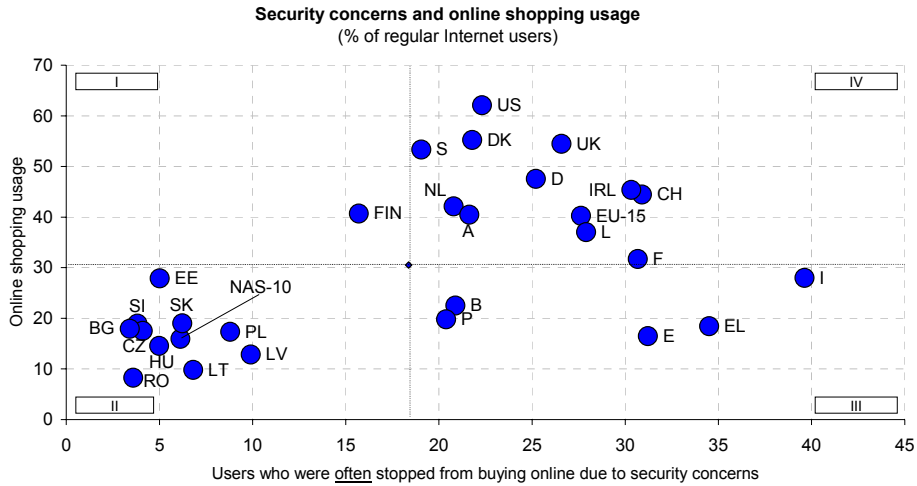


Figure 9: Security concerns and on-line shopping usage, SIBIS GPS 2002, SIBIS GPS-NAS 2003

Here we can observe a surprisingly low correlation among the general privacy/confidentiality (also security) concern and the fact that the consumers were actually stopped from buying due to there concerns. Nevertheless, we can observe two clusters (EU-15 and NAS.10) where there does exist such correlation and the corresponding slope is extremely high.

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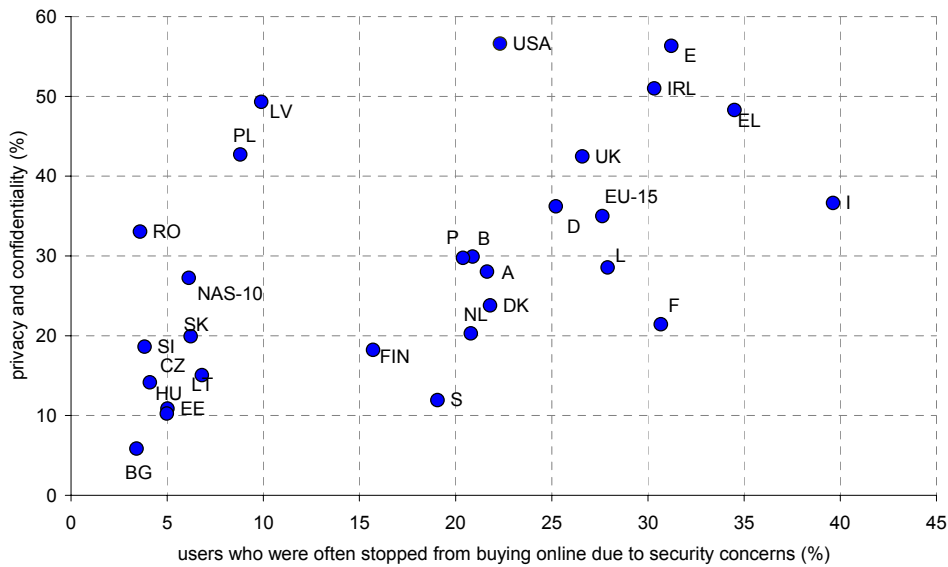


Figure 10: Users who were often stopped from buying online due to security concerns, SIBIS GPS 2002, SIBIS GPS-NAS 2003

Respondents already concerned about security were asked whether this was a barrier stopping them from buying online. Interestingly enough, answers were polarised, with one third of respondents saying "yes, often" and another third saying "no, never". The remaining third chose a middle way answering "yes sometimes".⁸ The elaboration by country shows some interesting variations which could descend from cultural differences. There are four countries (Italy, Switzerland, Greece and France) where respondents declaring that security concerns prevent them "often" from online purchases are approximately 40% of the total, and respondents "never" concerned are slightly less than the EU average. This is not a North-South divide, as it often happens for Internet indicators. Respondents who never let security stop them from buying online are in the main from Spain and Portugal, as well as the Netherlands and Belgium.

The conclusion is that security concerns are no doubt important barrier against e-commerce for a specific segment of the public, and more so in certain countries. SIBIS elaborations point out that these "over-cautious" users cannot be identified by age, sex or professional status (even if younger users do tend to be less worried). *Iako pgledate osnovno sociodemografijo kar za cello bazo skupaj, predvsem izobrazba, leta uporabe, stareost, spol.

It is possible in fact that the simple improvement of web sites security features may not be sufficient, without specific communication and marketing campaigns. Useful input could probably come from marketing research and understanding of cultural specificities accumulated in the financial sector for payment instruments such as credit cards. Although

⁸ SIBIS topic report on Security and Trust analysed this indicator by age and professional status, without finding very significant variations to this pattern.

among cultures 'privacy' has different meanings and importance, one must be aware that
.....tukaj tisti snapshot (

3 SECURITY/ PRIVACY AND ON-LINE SHOPPING IN SLOVENIA

3.1 The basic characteristics

We already saw that Slovenia is around EU average in general ICT usage, however, much below with respect to e-shopping. The gap can be attributed to the following:

- The awkward developments in the key on-line segments (books, music, retail) what caused the unique situation when the top on-line shops are from clothes (Neckermann) and home improvements/appliances (Merkur).
- The lack of the critical mass needed to develop more elaborated on-line shops.

Nevertheless, the telephone survey from December 2002 showed that year 2002 was the crucial year for Slovenian e-shopping due to the following reasons:

- the overall increase of the percentage of e-shoppers among Internet users (from 13% in 2001 to 16% in 2002).
- the increase of the percentage of active internet users (28% of the total Slovenian population in June 2002)
- the radical increase of domestic on-line spending
- which consequently increases the absolute number of e-shoppers.

The in depth RIS 2001 Web survey (15,000 respondents among Slovenian internet users) showed that almost 40% of respondents (more intensive internet users) did use e-shopping in

last 12 months. One third of them used only Slovenian servers, 40% only foreign servers and another third used both, Slovenian and foreign servers for e-shopping.

Number of e-purchasers

Our definition of e-purchase is that it is every purchase, which is ordered, but not necessarily paid on-line. In December RIS 2002 research about e-purchasing it was found, that share of internet users, which purchased at least one thing on-line is stable, except for June (when was 21% in 2002). The increase of average cash value of on-line purchases has also been noticed.

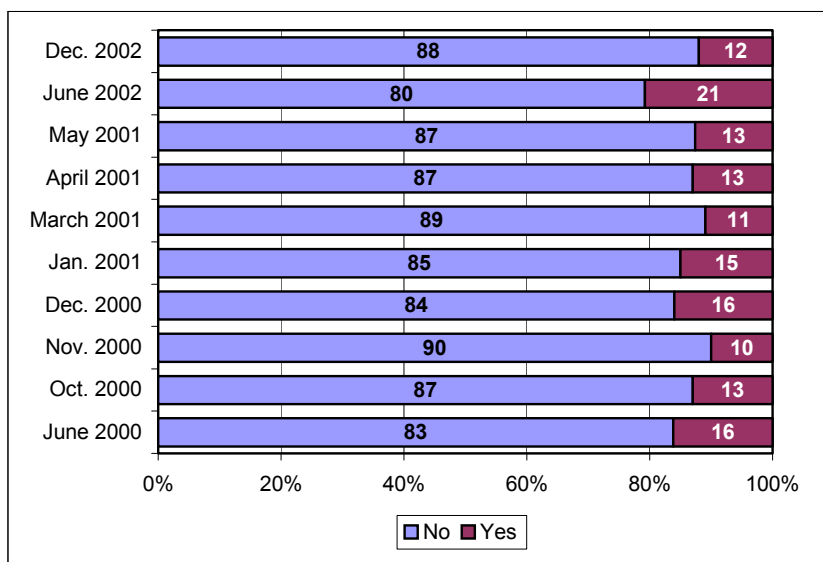


Figure 1: E-purchasing among monthly internet users in last 12 months (June 2000, n=216; October 2000, n=315; November 2000, n= 410; December 2000, n= 494; January 2001, n=338; March 2001, n=341; April 2001, n=564; May 2001, n=453; June 2002, n=235; December 2002, n=87).

It was also found that Majority of persons accomplished only e-purchases on slovenian sites.

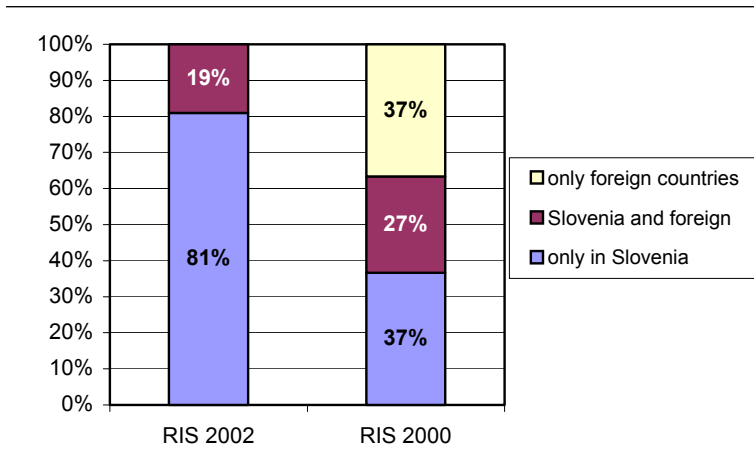


Figure 2: Shares of e-purchasers according to place of e-purchase (December 2002, n=48).

This is the result of high increase of less educated active internet users, which also explains increase in share of domestic e-purchases, because it was found that new users are visiting mostly Slovenian websites. Despite of high increase of e-purchases, e-purchasing (in last 12 months) is limited only to 7% of Slovenian population among 12 to 65 years and there is also notable a clear trend of on-line purchases in Slovenia only.

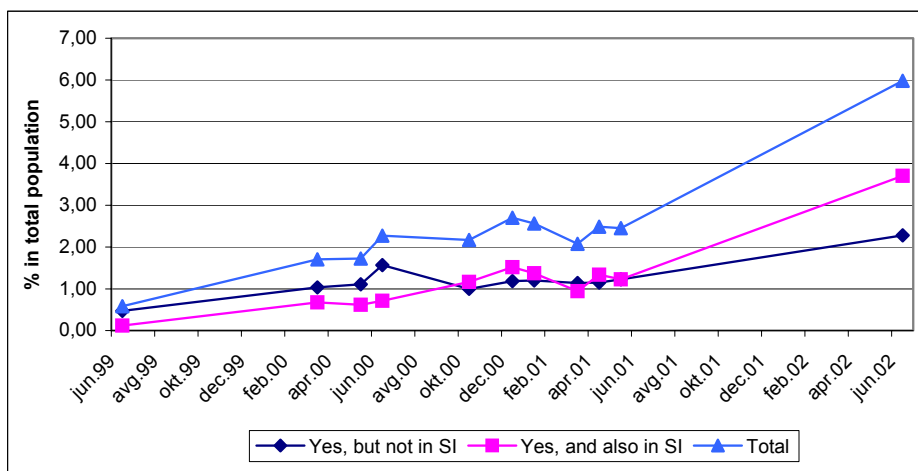


Figure 3: Share of e-purchasers in total population (RIS, June 1999 – June 2002).

Further analysis found out that among people e-purchasing is more male persons, people with higher education and daily or more frequent internet users.

Comparative to other european countries (comparison was made on data from Flash Eurobarometer, Eurostat and RIS) Slovenia is on the european tail; Slovenia also lags below EU average.

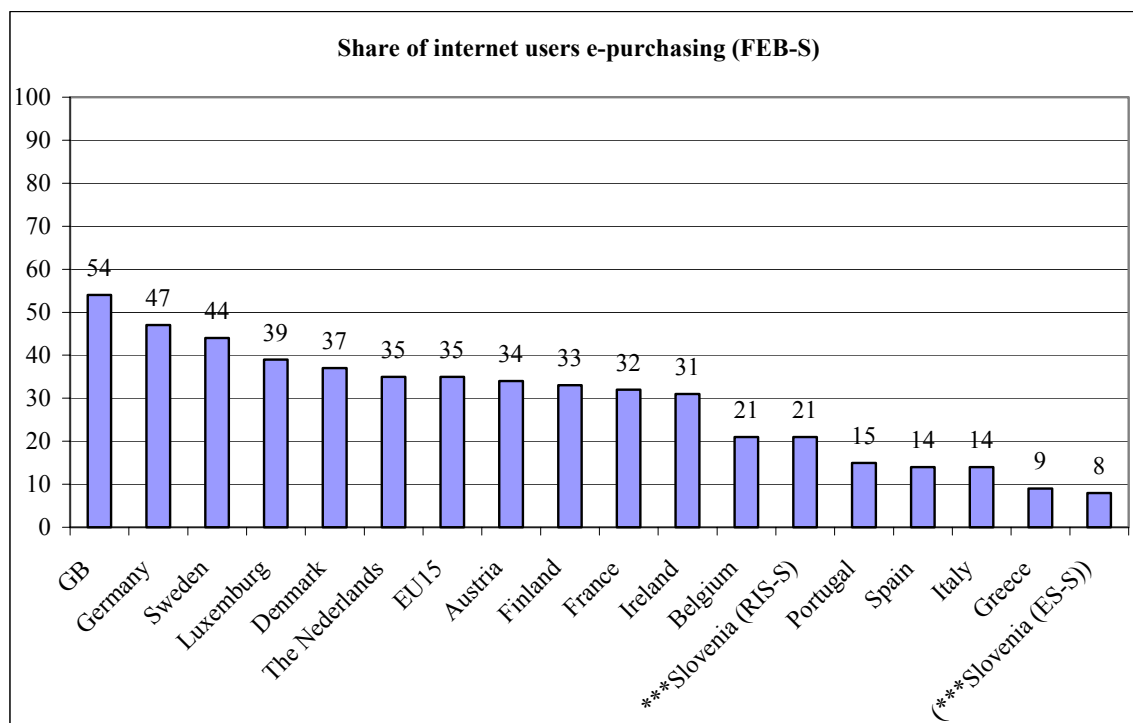


Figure 4: Share of internet users e-purchasing – comparison between SLO – EU (June, 2002). The most comparable for Slovenia are RIS data.

Average cash value of e-purchases

Survey from December 2002 has shown, that about half of the respondents accomplished purchases in an amount to 20.000 SIT, good quartile of them accomplished purchases in total amount from 20.000 to 50.000 SIT and other in greater values. Comparative to other surveys the results are not very different, but it was observed a decrease in purchases up to 10.000 SIT and an increase of purchases valued up to 20.000 SIT.

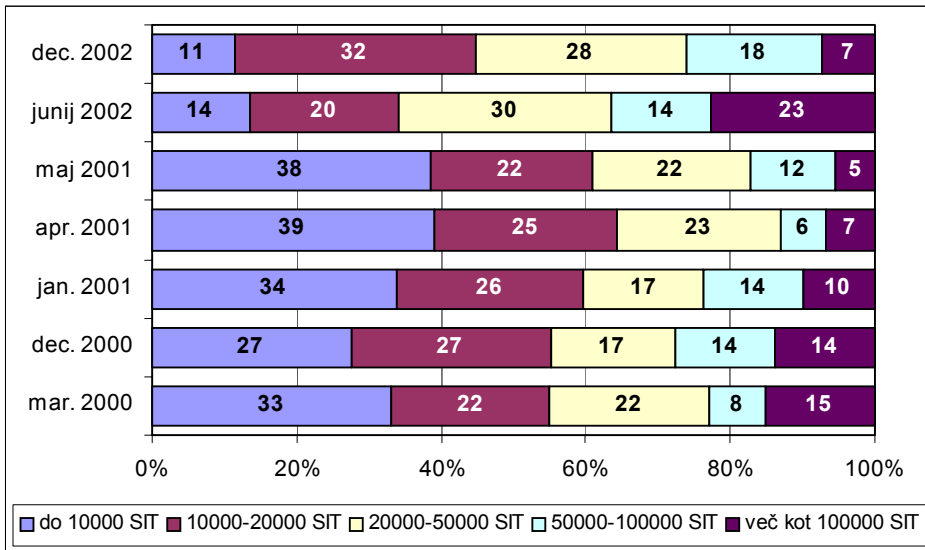


Figure 5: Cash value of e-purchases (March 2000, n=64; December 2000, n=32; January 2001, n=59; April 2001, n=68; May 2001, n=51; June 2002, n=44; December 2002, n=57).

It has also been found, that average amount of cash used for e-purchases dramatically increased for purchases in Slovenia in June 2002, which is a consequence of increased e-purchases in Slovenia.

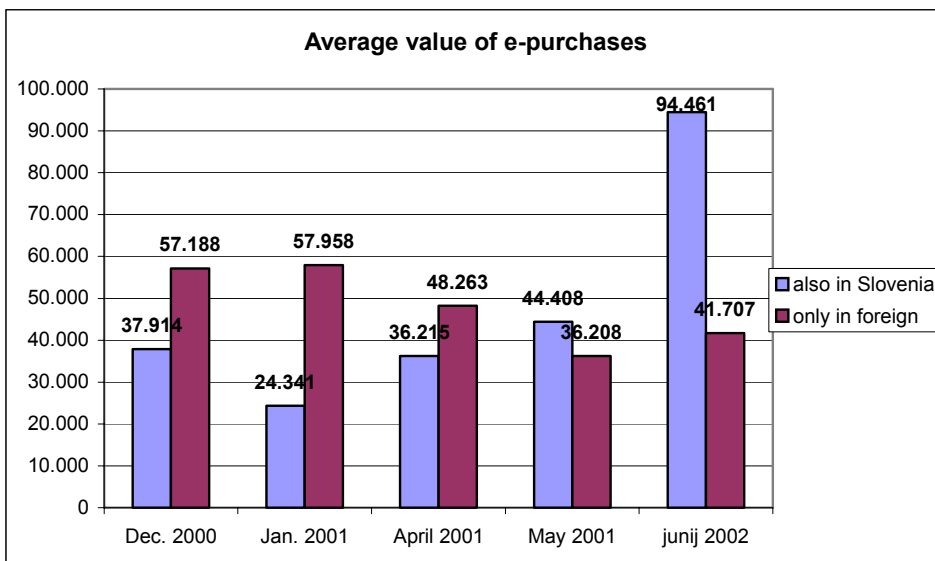


Figure 6: Average cash value of e-purchase according to place of e-purchase (December 2000, n=47; January 2001, n=57; April 2001, n=73; May 2001, n=57; June 2002, n=44).

Increase in average cash value of e-purchases and number of e-purchasers also caused an increase of e-consumption.

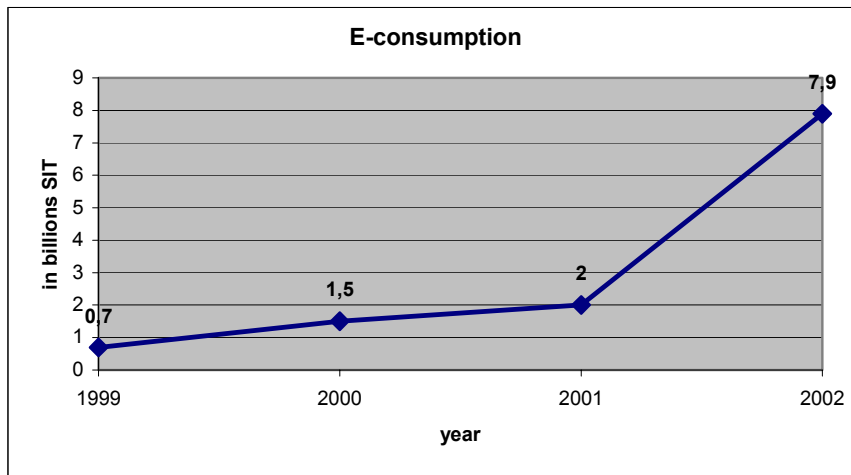


Figure 7: E-consumption in Slovenia from 1999-2002 (source: RIS surveys).

Payment

Majority of e-purchasers (83%) paid by a “cash to delivery” method in June 2002, and only 13% of them used credit card. Comparative to December 2000, there is an increase of payment by cash-to-delivery, but this could be a result of a fact, that number of e-purchases in Slovenian stores, which enables that method, is increasing.

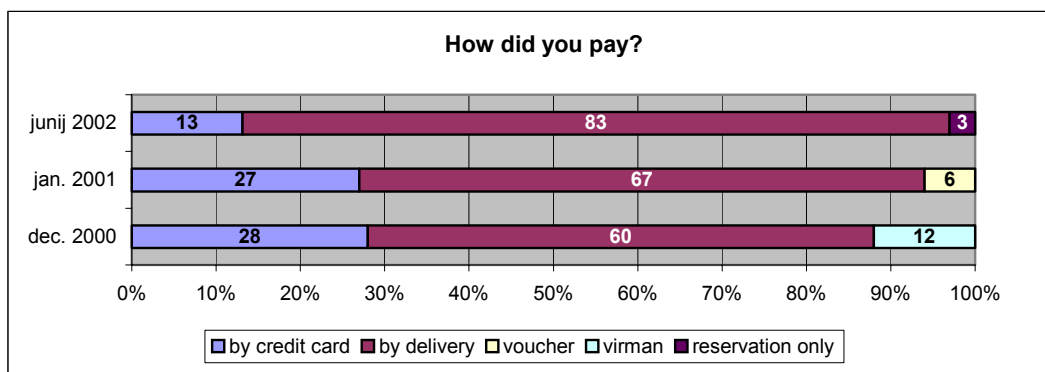
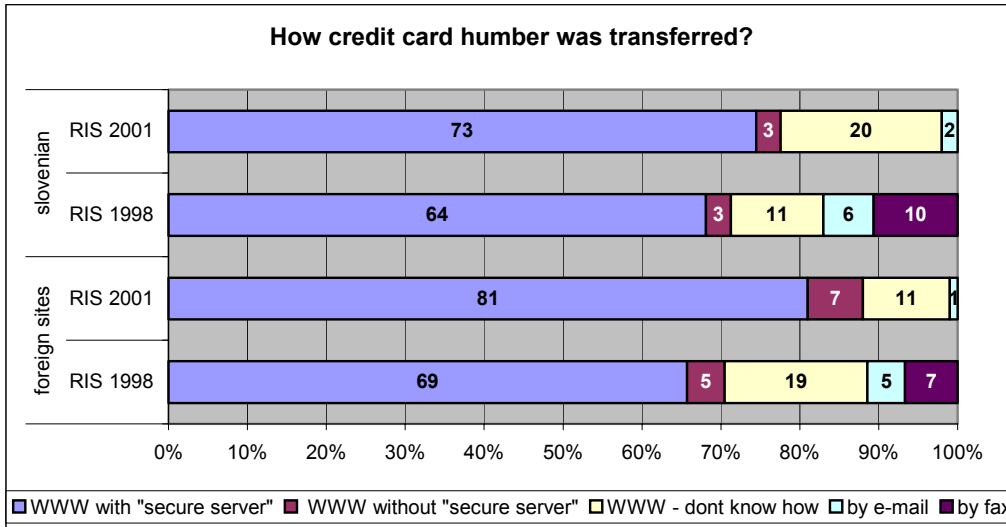


Figure 8: How respondents usually pay (December 2000, n=25; January 2001, n=33; June 2002, n=30).

Credit card numbers were mostly transferred using SSL (secure) websites.



Products and services purchased

E-purchasers were mostly (43%) buying clothes and sport equipment in last 3 months (found in June 2002 RIS survey), but number of books purchased decreased to a weak third of respondents.

All respondents (those who purchased and those who don't) were also asked in which products and services are most interested to purchase or search buying information about. Most interesting are travel reservations, books and CD's, and less interesting are food, cosmetics and labour-saving devices.

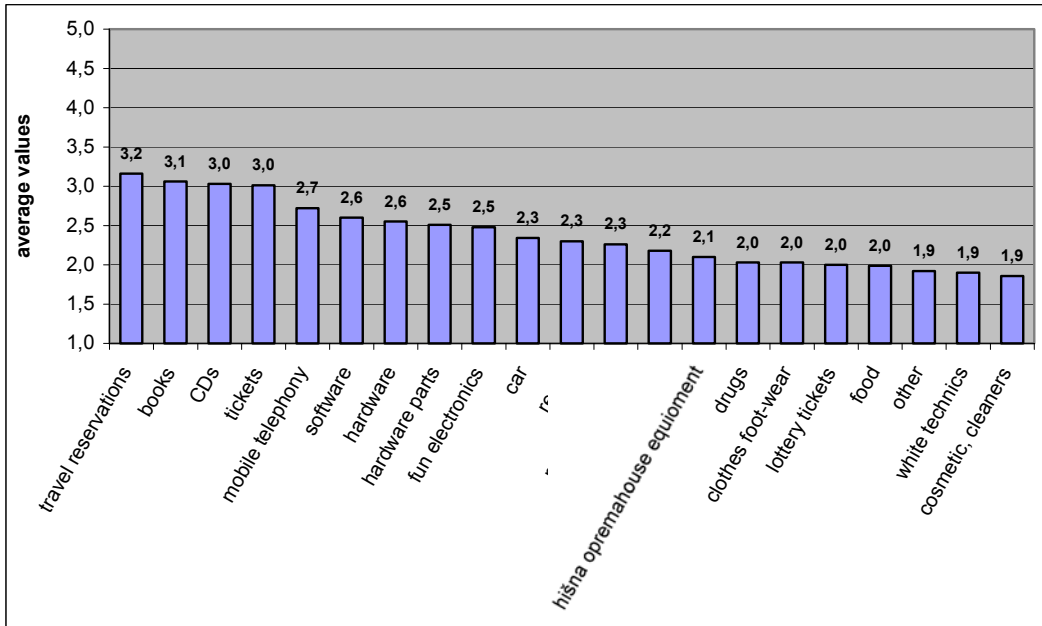


Figure 9: Interest for e-purchasing and searching for product information (RIS 2001, n=5,937).

3.2 Segmentation of on-line shoppers

Elder (Elder, 1999) have done some pioneer segmentation of on-line shoppers among US internet users. He found out five segments of e-purchasers: strong purchasers, freshmens, generation of plastic cards, careful shoppers and niggards. Similar segmentation of e-purchasers based on RIS data from 2001 was done by Papič (Papič, 2002). Papič found four groups of internet purchasers. First group was named “indiferents” and contains 19,6% of the respondents. They are not refusing internet shopping, but they don’t think it is very useful. They are concerned about security of e-purchase and about spam from e-shop, but they are more confident to classical catalogues purchasing.

The other group are “permanent shoppers”, and it contains 32,6% of the respondents. They see internet shopping as very handy, because they don’t like to lose their time by classical shopping. They are not concerned about security and privacy and they are also not concerned about spam. They also believe that they can get better prices using on-line shops.

Third group is called “sunday shoppers”. It contains 35,1% of the respondents. They are very similar to “indiferents”, but they do not use catalogue shopping. The last group is called “freshmens”. They do not have positive attitudes to on-line shopping, they want to see the product before purchase, and they are very concerned about security and privacy issues.

Despite there are two groups which are appearing in Slovenia and in USA – strong shoppers and freshmen, Papič found several differences between Slovenia and USA, which are mostly a consequence of different environment in which e-purchasers are acting. It seems that the most important differences between US and Slovenia are greater technical development of US internet, and more monotonous distribution of internet users among several demographic groups in US.

3.3 Preferred characteristics of on-line shoppes

Respondents in RIS survey from 2001 Web survey were also asked about characteristics of good on-line shops. The most important characteristic is simple navigation through on-line shop and the least important is possibility of telephone contact with the vendor. Respondents also designated short supply time and diversity of supply.

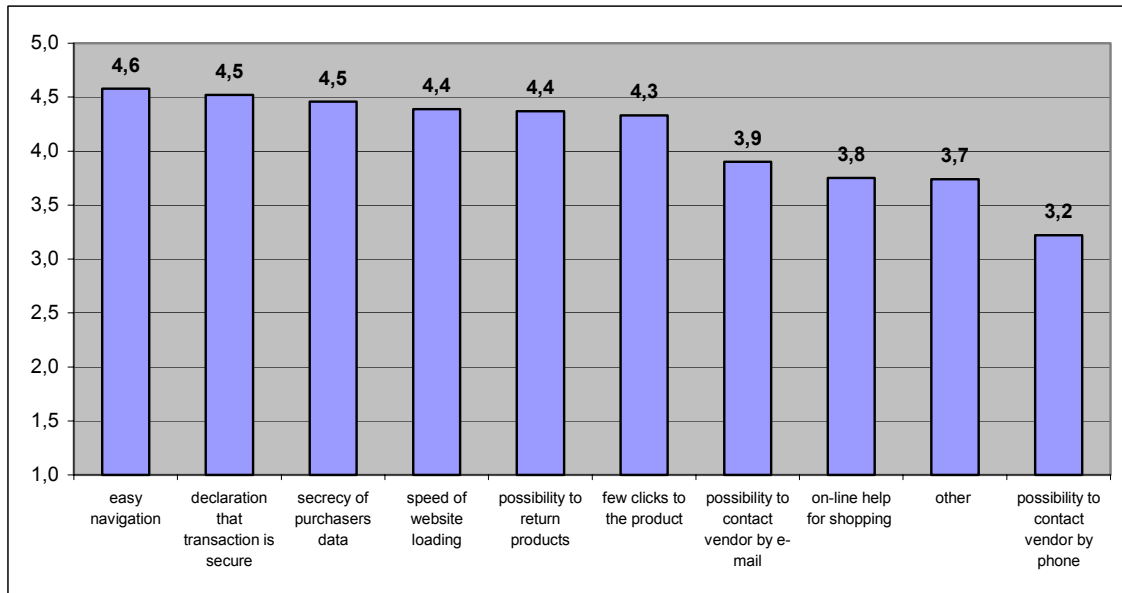


Figure 10: Average values for features of quality e-shop (RIS 2001, n=151).

Concerning presentation of products in internet shop, the most important is the price comparison, links to opinions and critics about the product and the information about accessibility of a product.

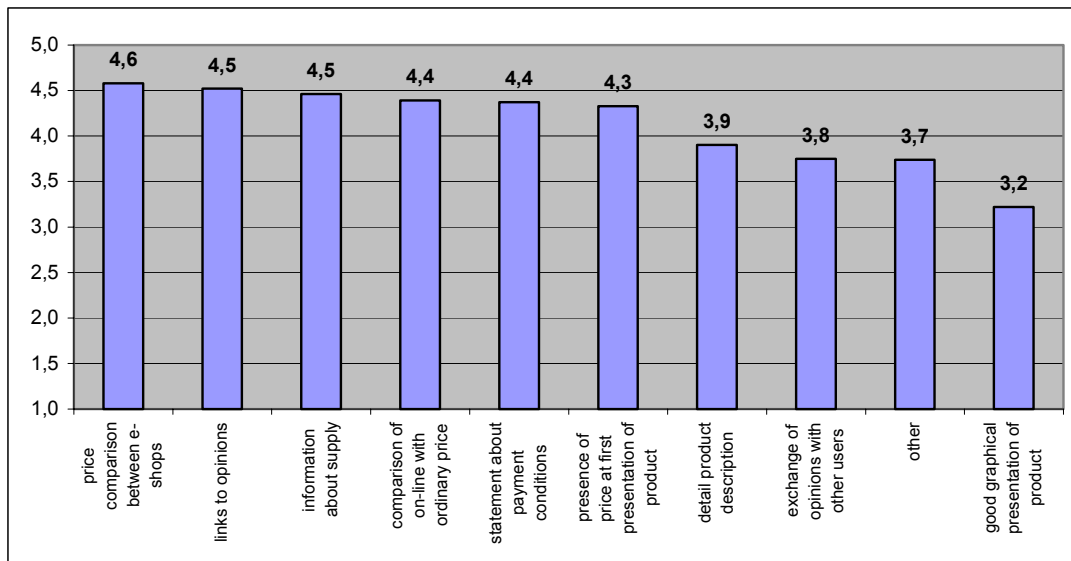


Figure 11: Average values for importance of presentation elements for product presentation on websites (RIS 2001, n=147).

3.4 Obstacles to on-line shopping

We tried to find out what are the major obstacles for on-line shopping. In a survey, a half of the respondents who are not on-line purchasers, were asked a question about the reasons not using on-line shops and the other half was asked about obstacles by on-line shopping.

The main reason not buying over the internet is that respondents want to see the product and they prefer traditional shopping. The next important obstacle is fear about credit card abuse and some of them do not see the need for internet shopping.

Table 1: Main reasons why internet users are not purchasing over the internet (June 2002, n=153).

<i>Reasons</i>	Number of selections	%
I want to see the product	107	37
Possibility of credit card abuse	41	14
I don't need it	36	12
Possibility of personal information abuse	22	8
Concern about delivery or return of a product	20	7
Concern about ignorance of complaint and request to return expenses	18	6
Habit, or loyalty to other shops	14	5
Problematic delivery	11	4
Other	8	3
Internet shopping is too expensive	7	2
Delivey time is too long	4	1
Products and services which I am looking for are not available on the net	4	1

Similar results were obtained among the other half of the respondents, those who were asked about e-shopping obstacles. The main obstacle is that they do not see the product, and

important obstacles are also delivery by post and waiting to purchase goods. Credit card seems to be no obstacle for majority of them and access to the internet also not. In fact, objection that respondents want to see the product often means that choice should be motley and prices lower.

Table 2: Obstacles for on-line shopping; average values and confidence intervals (June 2002, n=156).

<i>Obstacles for on-line shopping, 1 means no obstacle at all, 5 means great obstacle.</i>	Average value	std.error (se)	CI
I don't see the product in live	3.7	0,11	3.7 ± 0.3
I want to have a product immediately and not wait for delivery	3.0	0,12	3.0 ± 0.3
Not enough offer in Slovenia	2.9	0,11	2.9 ± 0.2
I am not interested in on-line shopping	2.9	0,13	2.9 ± 0.2
On-line shopping is not cheaper	2.8	0,11	2.8 ± 0.2
Delivery is complicated – forenoon I am not home, and it is dilatory to go to the post office	2.7	0,12	2.7 ± 0.3
The whole procedure of e-purchase is complicated	2.5	0,11	2.5 ± 0.3
I don't have a credit card	1.9	0,12	1.9 ± 0.3
I don't have a computer or acces to the internet from home	1.9	0,13	1.9 ± 0.3

*datjte to v sliko, itak ze obstaja

3.5 Consumer rights issues

Concerning consumer rights the main problems for e-purchasers were that website was unfriendly to them, delivery expenses were not clearly exposed and were unexpected high, payment was possible only by credit card and not by delivery and that they are receiving spam from the vendor after the purchase.

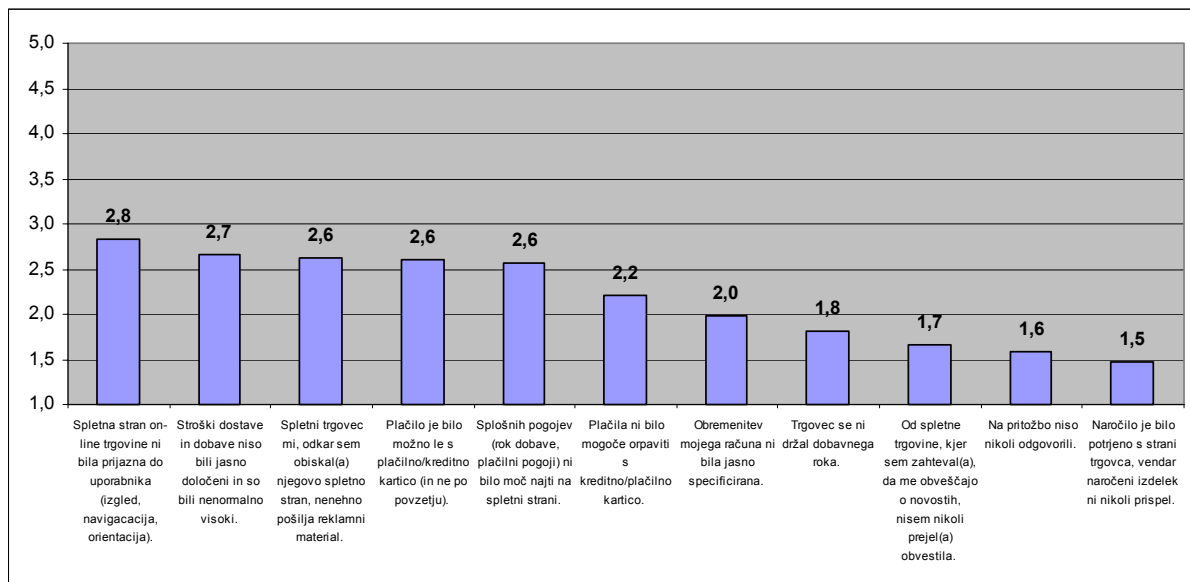


Figure 12: Average values for consumer rights by e-purchasing in Slovenia (RIS 2001, n=198).

4 MODELLING SECURITY CONCERN AND ON-LINE SHOPPING

The rich Slovenian data enable the modelling of the relation among security concern and on-line shopping. We should recall that the SIBIS data were only aggregated data on countries. The corresponding relations at the micro level may thus not be the same. For example, although there may exist the negative correlation among the security concern and on-line shopping at the country level, this does not mean (although it is somehow likely) that such relation will exist also at the individual level. In fact, it may be even the opposite. This well-known methodological problem is often referred to as “ecological fallacy”.

For our micro data model we used user’s attitudes towards security concern together with (subjectively) reported on-line shopping. First let us observe the attitudes themselves.

<i>Level of agreement with...</i>	<i>the average level of agreement</i>		
	<i>RIS 98 - WWW</i>	<i>RIS 2001 - telephone</i>	<i>RIS 2001 - WWW</i>
I feel inconvenient because of the possibility of credit / payment card abuse (1 - totally disagree, 5 - totally agree)	3,9	3,85	3,87
One of the factors encumbering use of e-shopping in Slovenia is... mistrust to paying through the internet (1 - totally disagree, 5 - totally agree)	4,2	--	--
I am worried about using credit card on the internet (1 - totally disagree, 5 - totally agree)	--	--	3,73
Why you do not use on-line banking ... I am worried about security of it* (1 - not important at all, 5 - very important)	--	--	2,8

Table 7: The average level of agreement with assertions about privacy and e-services. (*)

The term electronic transaction over the Internet is usually used for e-purchasing, e-banking and using other e-services. The most critical part of electronic purchase is sending credit card number through the internet, and the most critical part of the using e-banking or some other financial services on the internet is identity establishing. If hackers intercept credit card number or succeed to use untrue identity in e-bank, they can steal money or get some other

profit. It is important to point that problems of securing electronic transactions should emerge also for other e-services, such as e-voting, acquaint taxes over internet, accomplishing administrative tasks, etc. Web surveys RIS 98 - WWW and RIS 2001 - WWW have shown stable over-averaged worry about credit or payment card abuse and using on-line transactions on the internet.

Asked were those respondents who said they do not use on-line banking. Sources: Web surveys RIS 98 - WWW and RIS 2001 - WWW, telephone survey RIS 2001. It was also found that even those users who had already bought something over the Internet, feel worry about security of on-line transactions.

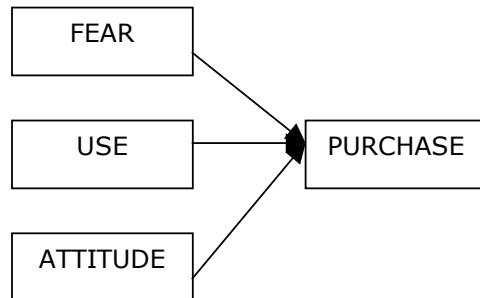
<i>Level of agreement with... (only respondents who already bought something over the internet)</i>	<i>RIS 2001 - WWW, the average level of agreement</i>
<i>Shopping over internet is safe (1 - totally disagree, 5 - totally agree)</i>	2,95
<i>How important is the following feature of on-line shop: declaration that you are buying over the secure connection (1 - not important at all, 5 - very important)</i>	4,53
<i>How important is the following feature of on-line shop: secrecy of consumer's data (1 - not important at all, 5 - very important)</i>	4,57

Table 8: The average level of agreement with assertions about privacy and on-line shops. Source: Research RIS 2001 - WWW.

All this findings lead to the conclusion that the fear of insecure transaction is an important obstacle for using on-line services, although the SIBIS results show that this rarely manifest in the stopping from buying.

In next step we develop a model of influences to on-line purchasing. Privacy concern is only one of the variables. Another two important variables are the attitude to on-line purchasing (does respondent perceive this kind of purchasing positively) and the level of Internet usage. Our assumption based on a previous research is that fear of privacy abuse will negatively

effect the willingness to use on-line purchase services. Positive attitudes to on-line purchasing will positively affect it and the level of internet use will also have positive effect to willingness to use on-line shops, because users who use internet more, are more experienced and therefore "equipped" to perform on-line purchasing. Model looks like this:



Picture 1: A model of influences to on-line purchasing.

Indicators in a model are described in the following table:

<i>variable</i>	<i>indicator(s)</i>
privacy concern (FEAR)**	I feel inconvenience about possibility of credit / pay card abuse. (1 - totally disagree, 5 - totally agree) <i>I am worry about security of data on the internet (1 - totally disagree, 5 - totally agree)*</i>
attitude to on-line shopping (ATTITUDE)***	One common factor from the following variable (all on scale 1-5): <ul style="list-style-type: none"> • Internet shopping interests me. • I know that offer (of goods) very well. • Comparative to other ways of sale, this way is much better. • I miss a big shop on the Internet in Slovenia.
the level of internet usage (USE)	How often do you use internet? (1 - many times a day, almost daily, weekly, monthly, 5 - less than once a month*)
actual purchase (BUY)	Have you, in the last 12 months, purchased something at home or in foreign county? (1 - yes, 2 - no)

Table 9: Indicators in the model.

(*) There were two surveys with the same indicators. One was telephone survey and the other web survey, both in 2001. Italic text indicates additional indicator for privacy concern in web survey and additional option about the level of internet usage also in web survey.

(**) Indicators in web survey were constructed by likert measurement procedure.

(***) Indicators were constructed by factor analysis. Extraction method was Principal Axis Factoring. Constructed factor in telephone survey explain 58,5% of variance, and factor in web survey explain 64,7% of variance.

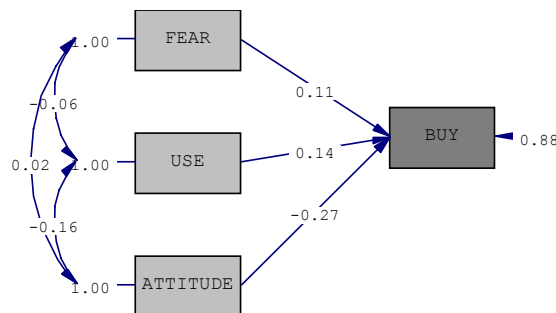
We tested the same model with data from representative telephone survey from March 2001 (n = 358) and with data from web survey RIS 2001 - WWW (n = 9648).

T-test has shown that in results from the telephone survey attitude to on-line shopping and actual purchasing is significantly different between those who had purchased something and those who not (significance is less than 0,001), while privacy concern and actual purchasing does not show significant differences

On the other side web survey results has shown that both t-tests are significant, but differences among respondents who had purchased something and those who not are much bigger in attitude to on-line shopping while differences in privacy concern are pretty weak. However Pearson correlation between attitude to on-line shopping and privacy concern is significant and high and regression analysis was done on both data.

Telephone survey

Standardized solution:



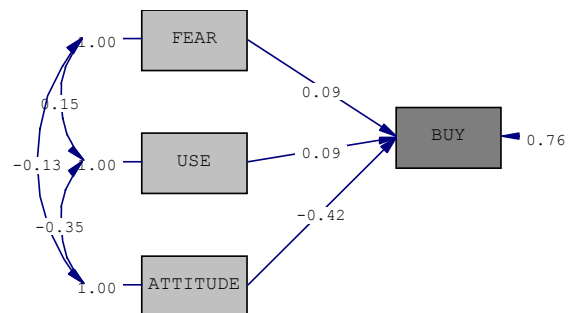
R-square: 0,114 (Adjusted R-square: 0,106)

F-value: 13,8 (sig. is less than 0,001)

T-values:

WEB survey

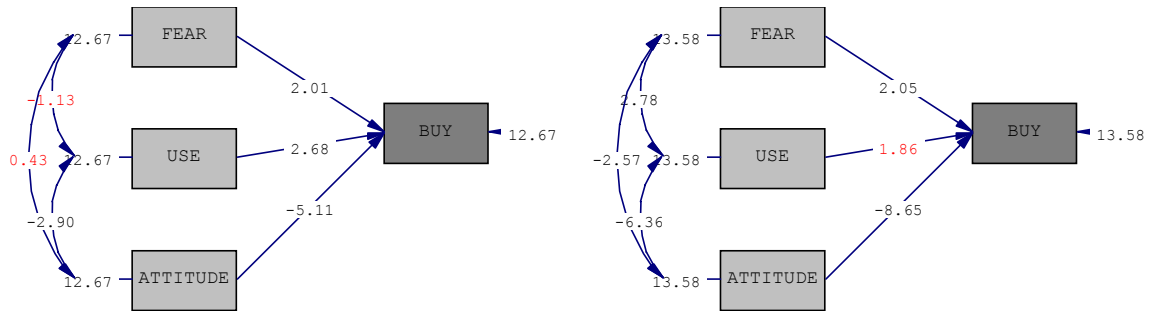
Standardized solution:



R-square: 0,208 (Adjusted R-square: 0,202)

F-value: 32,36 (sig. is less than 0,001)

T-values:



<i>variable</i>	<i>Beta</i>	<i>t-value</i>	<i>variable</i>	<i>Beta</i>	<i>t-value</i>
FEAR	0,11	2,01	FEAR	0,09	2,05
USE	0,14	2,68	USE	0,09	1,86*
ATTITUDE	-0,27	-5,11	ATTITUDE	-0,42	-8,65

Table 10: Regression analysis results (lisrel modelling was used).

(*) not statistically significant.

It was found that direct influence of privacy concern to actual purchase in web survey is comparable also to the results from representative telephone survey. However, the privacy concern and Internet use has only weak influence to on-line purchasing (in web survey internet use has even non-significant influence). The strongest influence has attitude to on-line shopping.

