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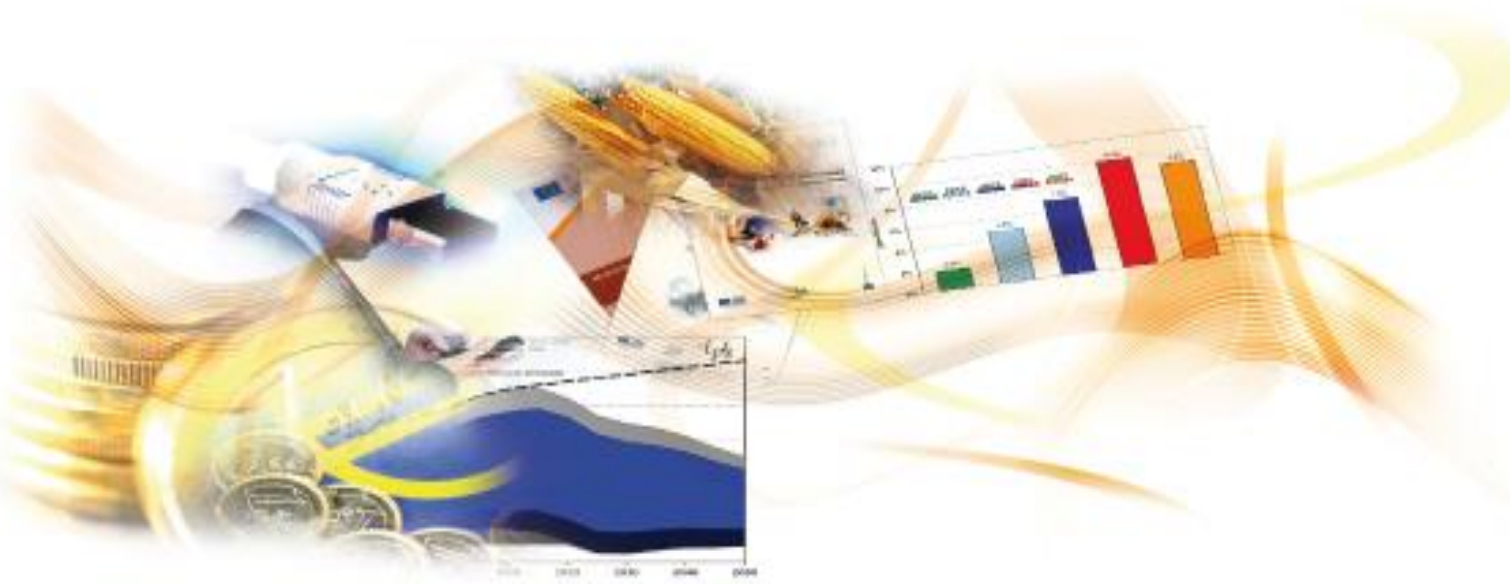

Institute for Prospective Technological Studies
Digital Economy Working Paper (2015-06)

Consumer Perceptions of (Cross-border) eCommerce in the EU Digital Single Market

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2015

Joint Research Centre

European Commission
Joint Research Centre
Institute for Prospective Technological Studies

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This publication is a Working Paper by the Joint Research Centre of the European Commission. It results from the Digital Economy Research Programme at the JRC Institute for Prospective Technological Studies, which carries out economic research on information society and EU Digital Agenda policy issues, with a focus on growth, jobs and innovation in the Single Market. The Digital Economy Research Programme is co-financed by the Directorate General Communications Networks, Content and Technology.

JRC97231

ISSN 1831-9408 (online)

Spain: European Commission, Joint Research Centre, 2015

Abstract
This report presents empirical evidence about the obstacles that European consumers face when trying to buy online goods and services in other EU Member States. It relies on data from a consumer survey carried out in February-March 2015 in the EU28. By comparing named websites with respondents' answers on the location of web shops, we find that 77% correctly assess whether a website is located domestically or in a foreign country. In addition, the report finds that prices, variety and transaction costs are strong drivers to shift consumer purchases of goods from offline to online shops, as predicted by economic theory. Consumers' perceptions of risks still holds them back from online transactions, which leaves some margin for policy makers to improve the regulatory and institutional setting. The results are less conclusive for online access to digital media content and for shifting online purchases from domestic to foreign markets

Summary

This report presents empirical evidence about the obstacles that European consumers face when trying to buy online goods and services in other EU Member States. It relies on data from a consumer survey carried out in February-March 2015 in the EU28. By comparing named websites with respondents' answers on the location of web shops, we find that 77% correctly assess whether a website is located domestically or in a foreign country. In addition, the report finds that prices, variety and transaction costs are strong drivers to shift consumer purchases of goods from offline to online shops, as predicted by economic theory. Consumers' perceptions of risk still hold them back from online transactions, which leaves some margin for policy makers to improve the regulatory and institutional setting. The results are less conclusive for online access to digital media content and for shifting online purchases from domestic to foreign markets.

1. Introduction

E-commerce plays an important role in the EU economy. It has grown at impressive rates during the past 15 years and in 2014 represented 7% of total retail trade (Duch-Brown et al., 2015). However, it mainly takes place within Member States' own domestic markets, and cross-border e-commerce seems to be lagging behind. The Digital Agenda Scoreboard (European Commission, 2014) reports that more than 50% of all consumers buy online but only 15% buy online across the border. Gomez et al (2014) report that only 18% of all B2C e-commerce spending in the EU was cross-border spending between Member States in 2011. The rapid rise of the Internet in the last two decades nurtured the idea of "the death of distance" (Cairncross, 2001): it was thought that geographic distance and country borders would be of no consequence any more with online transactions. We know today that this is largely overstated. Geographical distance and national borders remain important factors in online trade (Blum&Goldfarb 2006, Lendle et al, 2013; Gomez et al, 2014 ; Alaveras & Martens, 2015). Besides distance, these studies identify differences in consumer preferences, including cultural differences, such as language, as sources of online cross-border trade costs.

The EU is a geographically-segmented market along cultural, historical and institutional borders. One of its main policy objectives is to de-fragment this market and create a Single Market and, more recently, a Digital Single Market for online exchanges. While policy makers cannot change geographic distance or language, EU Digital Single Market policies seek to help consumers and producers to shift from offline to online markets and reduce the regulatory trade costs associated with crossing national borders. Many online trade barriers originated in offline markets (Coppel, 2000) and have now become more important since e-commerce has unfolded as an important distribution channel. These barriers include differences in tax regimes, online payments systems, consumer protection rules, copyright and other regulatory and vertical restraints in online distribution. A key question for policy makers is how much impact these barriers have on geographic and vertical online market fragmentation. Here we use consumer survey data to gauge the drivers of market fragmentation.

From the start of the internet, economists have examined incentives for consumers to shift from offline to online trade. Three types of incentives are usually distinguished: price competition, increased variety and lower transaction or trade costs. Earlier studies (Brynjolfsson, Hu & Smith, 2003 ; Chevalier&Goolsbee, 2003) found some evidence for lower prices online. Recent studies however are more doubtful about this effect (Duch-Brown et al., 2014). This may be an indication that competition between online and offline markets is becoming more effective and that price differences are not necessarily the main driver for consumers. Higher online product variety is also

a source of consumer welfare: consumers get more of the things they actually want (Brynjolfsson et al., 2003, Dixit et al., 1977). Civic Consulting (2011) estimates that, in the current fragmented EU Digital Single Market, consumer welfare gains from increased online choice and lower prices could reach nearly 12 billion €. Last but not least, consumer welfare may increase because transaction, trade and information costs diminish when shopping online. Transaction costs have two sides: real costs and residual uncertainty (North, 1992). Real cost savings occur because collecting information about available products is less time consuming online than offline. Reductions in real transaction costs constitute an incentive to go online. So far, few studies have looked into the incentive effect of time gains in online transactions (Brynjolfsson & Hu, 2012; Goolsbee & Klenow, 2006 ; Pantea & Martens, 2014). Residual uncertainty relates to consumers' perceptions of risk and lack of trust which may constitute a disincentive to buy online. This is where consumer survey data can be very useful. These three sources of consumer (dis-)incentives may also play a role in (de-)motivating consumers to buy cross-border. Duch-Brown & Martens (2014) estimate consumer welfare gains from lower prices in cross-border trade. Francois et al (2014) find that the shift from offline to online shopping reduces cross-border transaction costs. This has a positive welfare effect for consumers and stimulates GDP; however it puts pressure on trade margins and output in domestic retail services.

The main objective of the present study is to gauge the relative importance of these (dis)incentives for consumers to switch from offline shopping to buying online and to buying cross-border. We use data from an online consumer survey in the EU28 in the first quarter of 2015. The survey covers the three types of incentives and barriers mentioned above: prices, variety and transaction costs. Moreover, the survey data enable us to relate the impact of subjectively-perceived barriers to online (cross-border) trade on more objectively measured behaviour. This provides useful input for policy makers to assess where they can contribute most to eliminating these consumer welfare-reducing barriers.

This report is structured as follows. Section 2 discusses the data and possible sources of sample bias. We focus mainly on the reliability of respondents' answers about webshop location. Section 3 uses regression analysis to estimate the relative importance of different drivers and impediments to shifting from offline to online and from domestic to cross-border shopping online. Section 4 uses the survey data to build a cross-border bilateral online trade matrix and to estimate a gravity trade model. Section 5 analyses additional consumer clickstream data, which were gathered in two countries, together with the survey data. Section 6 presents some conclusions.

2. The consumer survey data

The survey was commissioned by the European Commission's Directorate General for Consumers (DG JUST)[1]. It was carried out by in the first quarter of 2015. It surveyed a total of 22,848 respondents in the 28 Member States of the EU.[2] The sample was designed to be representative of the European online population.[3]

The structure of the questionnaire is presented in Annex. It consists of four blocks. The first block investigates what consumers bought online over the last 12 months, how often they did so and where, and how much they spent online. Online purchases are grouped into three categories (tangible goods, online services, digital content).[4] The second block asks more specific questions about the last online purchase, including the online search process, characteristics of the online shop and the delivery. The third block asks about reasons for buying online. The last block examines the obstacles that consumers face in their online purchases. This covers delivery problems, actions undertaken to remedy them and concerns about buying online at home and abroad. The reasons for buying online and abroad cover the three types of incentives discussed above: prices, variety and transaction costs. The concerns are related to the residual uncertainty part of transaction costs.

In addition, the survey was complemented with consumer clickstream data collection and a diary questionnaire that was administered to a subsample of 1,054 respondents in two countries only (Belgium and Poland – about 500 respondents per country). The respondents were volunteers selected from the core survey sample and included consumers who planned to make an online purchase over a 2-week period. Clickstream data were collected by means of a tracking device that was installed with the consumers' permission on their computers. The diary survey complemented the clickstream data and asked questions on purchasing behaviour during the weeks the clicks were tracked. This allowed us to make unique cross-checks between more subjective replies to the survey and more objectively-observed clickstream behaviour.

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1 The complete survey consists of a core consumer questionnaire applied to respondents in all the EU28 and an additional clickstream dataset for a subsample of consumers in only two countries (Belgium and Poland). For all the analysis presented in this report, the data were cleaned from outliers. E.g. respondents who claimed to buy every product group daily (over 25 different products) were eliminated and the top 2% regarding the question of money spent were trimmed.

2 We did not use the consumer data collected for Iceland and Norway.

3 For a more complete description of the sampling methodology see GfK. 2015. "Identifying the Main Cross-Border Obstacles to the Digital Single Market and Where They Matter Most," European Commission, http://ec.europa.eu/consumers/consumer_evidence/market_studies/obstacles_dsm/docs/21.09_dsm_final_report.pdf.

4 The category "tangible goods" includes all physical goods (books, CDs, electrical appliances, toys), as well as offline services purchased online (booking travel services or buying tickets online). The "online services" category asks about the online usage of communication services (Email, Telephoning), web-based applications, social networks and cloud computing.

The target population of the survey was the European online population. The sample is broadly representative of the target population. Remaining gender and age biases were corrected with weighting factors since younger age groups and women were slightly overrepresented. We use the weighted values in this analysis unless otherwise mentioned.

The fact that the sample is not randomly drawn from a population but based on responses to an appeal for voluntary participation may be another source of sample bias. As a result, online panellists are probably more active and expert internet users (compared to the overall population of internet users). At the same time, they are probably less affluent than the general online population (more free time available and interested in the small sums of money they can get from participating in online surveys). We cannot measure or correct for this potential source of sample bias.

We cross-checked respondents' assumptions about the location of the website where they carried out their last online purchase ("in my country", "in another EU country", "outside the EU") with the actual location of the online shop as observed in another study (Alaveras et.al., 2015). Correcting for possible biases in consumer perceptions on the geographic location of a website is important in order to correctly gauge the actual extent of geographic market segmentation in the Digital Single Market. Most studies measuring the extent of cross-border e-commerce within the EU rely on survey information (European Commission, 2013). But typically, online shops do not display the location of their offices very prominently. In fact, it can be very difficult to know where an e-shop is based and hence misperceptions can prevail.

From the respondents (21,657) who answered the questions on their last purchase, 84% used a website to place their orders, 14% used an App and a mere 2% purchased via an Appstore. Most of the users who purchased via websites gave some details about the website they used, though half of these sites do not contain a full address (uniform resource locator, URL), but just a name (e.g. Zalando). Alternatively, respondents left a comment (e.g. "do not remember"). With the remaining information and after some basic cleaning, we managed to merge 8,816 website entries from the survey with an existing database on the geographic origin of online shops.[5] This subsample is representative of the entire sample.

The results (see Table 1) show that cross-border purchases are largely reported as such. From the respondents who reported a domestic purchase, 84% actually bought on a domestic website; while 16% were actually buying in another country. Conversely, about 21% of those who reported buying

[5] The online shop location data were derived from Amazon Alexa data on website traffic. For a more detailed discussion of the data and methodology for determining the website location (Alaveras G. and Martens B., 2015)

from a shop in another EU Member State were actually buying at home. In total, 71% of all respondents correctly classified the geographic location of the website from which they bought. It may well be that consumers confuse to some extent "foreign location" with "foreign language" on websites. We cannot verify this directly because we have no information on the language used by the website where consumers purchased. Another reason may be that the location of a web-shop becomes even less visible when purchasing digital content and no physical delivery is involved. Indeed, the correct answers were highest for tangible goods (see Table 2). However, purchases of digital content represent only 5% of the sample and this cannot explain all the observed misperceptions in this sample. Despite the observed misconceptions in location of webshops, the conclusions drawn from the survey are largely not distorted. Table 1 shows that the distribution of perceived and of actual purchases are similar, only the cross-border purchases outside the EU are underreported.

Similar questions were asked in the consumer diary surveys in Poland and Belgium. Here, we were able to match 966 purchases (from a total of 1,723 reported purchases) from 527 respondents (See Table 1C). The overall accuracy of correctly locating the web shop is 73% in the diary survey, similar to the percentage observed in the core survey. On average, the two countries show a similar pattern to the EU28 average. A closer look at the Polish survey, however, reveals that respondents are far more focused on domestic shopping than respondents in Belgium. In total, 82.7% of Polish respondents reported buying on domestic websites. The website "allegro.pl", a Polish online auction website, is cited as the URL for an overwhelming majority of the respondents. This applies much less to Belgium, where the two most frequently-cited websites were foreign ("bol.com" and then "amazon.fr"). Consequently the percentage of domestic orders in the Belgian diary survey (46%) lies below the European average. Countries with the highest domestic purchases are France (86%), and Germany (92%)[6]). At the other end of the scale, less than 5% of respondents used domestic websites in Cyprus, Luxembourg and Malta. In addition Ireland, Austria and Croatia have a low home bias (between 25% and 35%). For the clickstream analysis, it is interesting to keep in mind that Poland has a moderately high home bias whereas in Belgium it is relatively low.

In the regressions, we used the survey replies to explain e-commerce consumption. We grouped the explanatory variables into four categories: Concerns, Reasons, ICT Use and Demographics. The summary statistics for these covariates are shown in Table 4.[7] The ICT use variables were derived from the usage of online services. The "Social network" use dummy takes value 1 when

[6] This numbers are based on unweighted averages on the merged subsample.

[7] These summary statistics were compiled after some basic cleaning of the data e.g. for respondents who claim to buy every product category every day.

respondents participate in social networks at least once a week. “Advanced” refers to the usage of online services to transfer and store files.

3. Drivers and impediments to online domestic and cross-border purchases

To understand how different concerns about shopping online and reasons for doing so shape consumer decisions, we distinguish between the extensive margin (the number of persons who shop online) and the intensive margin (expenditure on online shopping). We run separate regressions on the survey data for each of these margins. See Table 5a/5b and Table 6 for the extensive margin and Table 7 for the intensive margin. First, we examine the factors that affect a consumer’s decision to buy online and to buy abroad (cross-border). The dependent variable in this logit regression is a dummy that takes the value 1 when a respondent has purchased online within the last 12 months (columns titled “total” in Tables Table 5a/b). We run a separate logit regression within the group of online purchasers when purchases have been made cross-border, with the dependent variable taking the value of 1 if this is the case (regressions titled “Crossborder” in Table 5a/b).[8] Second, we look into the drivers of the volume of online purchases in total and purchases abroad (Table 7). The dependent variable in this OLS regression is the Euro amount spent on online purchases

Moreover, for cross-border purchases, we should make a distinction between a consumer’s subjective perception of the geographic location of the seller (abroad or at home) and the objectively-verified location (See Table 7). However, we can only make this comparison with a smaller data sample on the last purchase, for which we have website information. We run the logit regression twice, once with the information given by the respondent on the geographic location of the seller and a second time with the corrected location information (as explained above). Note that using the perceived location not only generates a larger sample of observations but also better information that helps us understand the conscious decision to buy on a website in another country.

Table 5a reports the marginal effects calculated for the population average (i.e. all the explanatory variables are estimated as deviations from the mean value). While the magnitude of the coefficients in the logit regression is difficult to interpret, the marginal effect coefficients measure

[8] The dependent variables are constructed from the Questions 2a (Answers 1-10 for tangible goods and answers 11, 12 for services) and Q4a (digital content). If any of the products in the group was bought at least once, the respondent was coded as 1 for being an online shopper for the product category, 0 if no product was bought. The coding for the cross-border variable is based on answers in Q2b and Q4d. If any of the products from the product category was bought in another country in the EU or outside the EU, the respondent was coded with 1 for being a cross-border online shopper. They were coded as 0 when they bought all products at home, and coded as missing if they never knew where they bought or did not buy the product at all ; see the questionnaire flow chart in the Annex III.

the impact in percentage points on the dependent variable. For example, concerns about payment card details being stolen decreases the likelihood that a consumer buys online by 1.23 percentage points and the likelihood that he buys cross-border by 4.1 percentage points. Furthermore, we include a table with the odds ratios (Table 5b). These are obtained by taking the exponent of the logistic regression coefficient and they represent the ratio of the probability of success and failure**.** Price changes the likelihood of buying goods online by 1.4 percentage points. The corresponding odds ratio for this item is 1.99 or nearly 2, which means that respondents interested in cheaper products are nearly twice as likely to buy goods online as respondents who do not think that price is a major reason for e-commerce.

Survey questions are grouped into four categories: Concerns, Reasons, ICT use and Demographics. The "reasons" categories roughly correspond to the three economic motives for consumers to shift consumption expenditure from offline to online purchases: prices, variety and quality, and transaction and information costs or the real transaction costs. We expect "reasons" variables to come with a positive sign in the regressions. The "concerns" category covers the residual uncertainty dimension of transaction costs, including factors such as trust, quality of the delivery and post-contractual uncertainties about application of consumer rights and settling disputes in online transactions. Concerns variables should show a negative sign in the regressions: more concerns should logically reduce the number of consumers and the volume of online trade. ICT use variables are considered to be good proxies for the online skills and savviness of consumers. More savviness should have a positive impact on online transactions. The demographic variables control for sample bias in age and education. Age and education are considered to be good proxy variables for income, in the absence of an objective income variable in the survey.[9] We also add country fixed effects to the regressions to control for possible country-specific factors including country sample bias. The tables show the results for consumers who shop online and cross-border for three different product groups: goods, travel services and online digital media content. Statistically significant coefficients up to the 5% level are marked in bold. Non-significant coefficients can be considered as zero and are not relevant in the analysis.

The "reasons" group shows the expected positive sign for price, variety and transaction cost related questions. Cross-border purchases of goods are mainly driven by quality reasons. The pattern of drivers becomes more fragmented for travel services and media content where quality and some types of transaction costs still play a role. Only quality and more choice seem to matter for cross-border purchases of travel services and digital media content. Some results for cross-border travel

[9] Another possible proxy for income is the question about the financial situation, in which respondents are asked whether it is easy or difficult to make ends meet every month. Though it provides an equally interesting proxy, it relies on respondents' subjective perceptions of their financial situation.

services and for paid digital content are counter-intuitive with negative signs; this needs further investigation. The "concerns" group of variables shows considerable negative impact in the first column only, for trust and consumer rights-related issues. Beyond that, the pattern becomes more dispersed and it is hard to find a story line in all this. Somewhat surprisingly, digital content buyers report significant problems with damaged and undelivered products and returning products. Concern about payment cards ("details may be stolen") mainly affects consumers who consciously download digital content cross-border or pay for this service.

The marginal effect for the purchase decisions are very small because, for the mean population, the probability of shopping online is already quite high and therefore only changes marginally with reasons or concerns. The demographic control variables mostly follow the expected patterns. Online purchases diminish with age – although online expenditure increases with age (see Table 7). Women spend less on online purchases than men. Education levels are positively correlated with the decision to buy online, for goods, travel services and digital content. However, education is correlated with online expenditure only for goods, less for travel services and not at all for cross-border digital media content. But consumption of digital content is not necessarily linked to monetary payment. When only paid online content is taken into account, the highest educational level becomes significant again. Knowledge of languages is also positively correlated with online purchases and so are advanced internet skills.

A somewhat peculiar variable is the use of social networks: more frequent users tend to avoid shopping cross-border. The cross-tabulations in the original GfK report show that frequent use of social networks is positively correlated with younger age and difficult financial situation, which may explain the effect. In fact, the probability of purchasing cross border is reduced by 5 or 8 percentage points for goods and services respectively. Furthermore empirical research has shown that social networks are predominantly formed by geographically local ties (Takhteyev et al., 2012), therefore its increased usage may support the diffusion of local websites and web shops.

An interesting finding is that consumers in urban areas are more inclined to buy online than those living in rural areas. Intuitively, one would expect the contrary to be true because urban consumers already have access to a wider variety of goods at lower transaction costs (transport and time). However, the demand for variety and the opportunity cost of time may be higher in urban areas thereby pushing more consumers onto the internet.

To compare potential different drivers and concerns regarding purchases within and outside the EU, we re-ran the extensive margin regressions separately for cross-border purchases within the EU (columns labelled "EU") and outside the EU ("WW" for worldwide) (Table 6). There is a considerable overlap for these purchase decisions. From the online cross-border shoppers, only a few buy

exclusively within the EU (50% of EU shoppers also buy outside the EU) and even fewer buy cross-border exclusively outside the EU (90% of worldwide shoppers also buy in another EU country). Consequently the differences in the coefficients are rather subtle.

Table 7 applies the same patterns to identify statistically significant factors at the intensive margin or the volume of online trade. Again we find that price, variety and transaction costs constitute strong incentives for consumers to shift from offline to online purchases of goods. The drivers for the decision to consume digital content are somewhat less clear.

The demographics picture at the intensive margin has some interesting features. First, education becomes a stronger explanatory variable for the volume of online purchases at all educational levels. This is probably linked to the fact that education is correlated with income and thus with purchasing power. On the other hand, education is a poor explanatory variable for purchases of digital content. Clearly, students access online digital content cross-border more often irrespective of their age. Taking into account that the reference education level for these regressions is primary school level, it implies that there is no significant difference in behaviour between these school age groups. Second, age is now positively correlated with online expenditures. The true explanatory variable here is probably again income and purchasing power that are positively correlated with age.

The dependent variable of the regression is measured in the logarithms of Euros spent on online goods; therefore the displayed coefficients in Table 7 reflect the percentage changes in expenditure. If respondents name "There's more choice online" as a main reason for buying online, they will spend 22% more on online goods in total and 15.5% more cross-border. Similarly, respondents who worry about not understanding the terms and conditions when buying online, spend 25% less on online goods.

To account for the problem of consumer misperceptions about where they buy, we run the cross-border logit models on the website data provided with the questions on the last purchase (Table 8). This combines all types of goods (and therefore product fixed effects are introduced). The first column shows the results for the uncorrected data for the full sample. Despite slight differences, the general picture remains comparable to the cross-border regressions in the previous tables (e.g. Table 5). The second column shows the results for the reduced sample, but still using the perceived cross-border information as the dependent variable. This reduces sample size from nearly 16,000 to about 6,700 observations. Therefore differences between the two columns are due to sample selection issues, because we can only use the corrected country information for respondents who enter an entirely valid URL. This is correlated with education. Looking into the sample differences, a disproportionately higher number of respondents who are students or have college degrees have

entered valid website addresses. Within this sample, however, education no longer has a significant effect on the decision to buy cross-border. For the regression with the reduced sample the signs of the coefficients remain the same, but significance is lost in some coefficients. When we look at the last column, with reduced sample and corrected data as the dependent variable, we find that signs overall remain the same, but significance is gained and lost. Notably, respondents who worry about theft of payment card details consciously buy less cross-border, but actually use international sellers just as much. This might suggest that the reputation of a known foreign seller, most probably selling in the same language, matters more than an unknown local website in terms of trust. Respondents who value e-commerce for finding better quality and specific products consciously buy more cross-border, but in the corrected version it shows that they do not shop abroad disproportionately often. The number of languages spoken and advanced use of the internet leads to increased cross-border purchases in all three regressions.

In a further step towards identifying barriers, we applied principal component analysis (PCA) to the 17 items on concerns about e-commerce. PCA is a common multivariate technique to reduce the number of variables, overcome multi-collinearity issues or develop an index out of different variables. In a first step, independent principal components are constructed from linear combinations of the originally surveyed variables. We chose five components[10] and interpreted them according to the variables that contributed the highest loadings (or correlation). Table 9 shows the results. Loadings above 0.5 are considered to be strong. Components 2 to 5 roughly represent the groupings we used in the previous regressions, while the strongest first component pools variables related to cyber-crime (stealing payment details and misuse of data).

In a second step we replaced the original variables in the intensive margin regressions with the principal components. The results (Table 10) underline the fact that concerns related to cybercrime issues (misuse of data, payment details being stolen) are strongly negatively correlated with purchasing online and with the conscious decision to buy in foreign countries. Another interesting result is that remedies, which mainly combine the answers of "Returning a product is not easy" and "Replace or repair is not easy" now have a significant impact on buying goods online and cross-border, unlike the single items. As expected the remaining covariates show similar results to the regressions on the single concerns variables.

Finally, it is important to note, that it is not possible to identify the direction of causality of the concerns and reasons with these regressions, because they are not clear exogenous variables. For example, the concern of "payment card details may be stolen" showing a negative coefficient, does

[10] In our case, the 5th component was the last to have an eigenvalue of bigger than 1, which is commonly suggested as a good indication for selection of components.

not imply that this concern keeps respondents from purchasing online. The statistically significant relationship exists, but could also describe a consequence of experiences with online shopping. Careful interpretation of the coefficients using underlying theory and further scrutiny of interesting results are necessary.

4. An analysis of cross-border trade patterns

We used the survey data on the amount spent on domestic and foreign purchases of goods and services to construct a 28 x 32 online trade matrix for the EU28 Member States. We combined the information on expenditure with information about the geographic location of the providers (Q2d-Q2f and Q2e for goods and Q4f-h & Q4e for digital content; see the questionnaire flow chart in the Annex III). Expenditure is split into "total", "in another EU country" and "outside the EU". The difference between the first and the last two is assumed to equal domestic expenditure - a question not asked explicitly in the survey.[11] The survey does not have details on cross-border expenditure by country. Due to the lack of more precise information, we allocated expenditure "in another EU country" equally among the EU countries listed by each respondent, and similarly for "sellers based outside the EU". Since cross-border trade normally decreases with distance, this allocation procedure will result in an over-estimation of expenditure (the intensive margin of trade) in far-away countries compared to nearby countries. On the other hand, we can assume that consumers would mention further-away countries less frequently, which would ensure some correction of the extensive margin of bilateral trade. However, the net effect is still likely to be an overestimation of long-distance trade. The matrix is presented in Table 11.

Average expenditure by country is the weighted averages of all online shoppers in that country (Table 11). The numbers given in the table are the weighted average Euro values calculated from the survey multiplied by the e-commerce population. The size of the e-commerce population is taken from Eurostat as the number of people who have purchased online at least once within the last year.[12] The numbers in the trade matrix are therefore inflated by the e-commerce population to project the actual monetary e-commerce expenditure of the countries. From the 868 cells of the matrix, 46 have the value 0 because the country combination was not cited by any respondent in the survey. Malta and Estonia were not cited at all by respondents in other countries as a destination of an e-commerce shopping tour.

[11] Respondents who do not know where the online seller is based are not included in these calculations and it is therefore assumed that their expenditure distribution resembles that of the remaining population.

[12] Though the consumer survey was conducted 2015, the questions of online expenditure refer to the consumption within the last year and therefore covers largely 2014. Therefore the adequate Eurostat data is taken from 2014.

We compare this country matrix with a second bilateral trade matrix with trade data corrected for the actual geographic location of the website (Table 12). However, some important caveats must be taken into account for the corrected trade matrix. Firstly, it uses information on the last purchase only. Second, it uses only websites for which we have a verified geographic origin. Thus, the sample size is reduced to less than half (n=8816). This may leave enough observations at country level; on average we have about 300 observations per country. However, this may be too limited a number to fill up the 28 x 32 = 896 cells in the matrix. . For 642 (70%) of the country combinations, no last purchase was made. The cross-border purchases within the EU are concentrated around Germany, Netherlands and UK.

The same matrix has been calculated for 2011 (Gomez et al., 2014), with the difference that the past survey only included tangible goods and therefore travel services, for example, were not included. We compare the data from the consumer surveys with e-commerce retail information provided by the market research firm Euromonitor in Table 13.[13] In most cases, the calculations based on the consumer survey are larger than the industry data, which indicates that respondents might overestimate the value of their purchases. Both sources coincide in the identification of the Top 3 e-commerce countries and show roughly similar estimates. For smaller e-commerce countries the differences become larger and estimations less precise due to smaller and less representative survey samples and fewer trade statistics from Euromonitor.

Table 14 breaks up these e-commerce expenditures into amounts spent at home, in other EU countries and outside the EU. If we can assume that misreporting of cross-border transactions remains constant, the home market share has decreased over time. Some small countries with relatively low rates of domestic online purchases (Luxembourg, Malta and Cyprus) buy substantially more online in their country 2015 compared to 2011. Additionally it is worth mentioning that two of the countries (Czech Republic and Hungary) with a high domestic market share in Table 14 show a very different picture when we look at the corrected data from the last purchase (Table 12), where domestic shares are less than 25%.

We apply the well-known gravity model of international trade to the bilateral trade matrix, in line with previous research (Blum & Goldfarb, 2006; Hortaçsu, 2010; Lendl et al., 2012; Gomez et al, 2014). This model explains the value of bilateral trade between two countries as a function of the cultural and geographic distance between them, consumer preferences and country-specific fixed effects. Apart from transport costs directly linked to geographic distance, the distance coefficient in the model may also cover other cross-border trade costs including costs due to regulatory

[13] Data sources for the Euromonitor Passport database are official statistics, trade associations, trade press, company research, trade interviews and other trade sources.

differences between countries, financial transaction costs, and information costs incurred in bringing the trading partners together in a transaction, among others. Goods still need to be physically transported to the consumer, even though they have been bought online. We therefore assume that transport costs remain important in online trade. However, online digital media content is not subject to transport costs since it can be directly downloaded by the consumer. Hence, we should expect the distance coefficient associated with pure digital trade to be lower than those related to transactions that require physical delivery.

Empirical applications of the gravity model include variables indicating other types of proximity, beyond distance. For instance, a dummy variable indicating whether two countries are contiguous controls for potentially shared cultural traits or historical relations among their respective populations. Shared language turns out to be significant in most cases, since it captures the trade costs related to "cultural distance" (Blum & Goldfarb, 2006). For cross-border e-commerce, language may be an important measure of cultural distance, especially in a B2C trading environment where a shared language is essential (Gomez-Herrera et al., 2014). The gravity equation can also handle observations on domestic trade (when the country of origin and destination are the same). Following Gomez-Herrera et al. (2014), we introduce a dummy variable for domestic trade observations in the gravity model. The coefficient on this dummy is an indicator of home bias or the extent of consumer preference for domestic over foreign products. The home bias factor essentially measures consumers' "natural" preference for the home market. We estimate home bias for both goods and digital content and compare them to see if the nature of the product has an effect on consumer preferences for domestically produced/delivered goods. Since many factors remain uncontrolled, we also introduce importer and exporter country fixed effects to account for many unobserved country factors.

Table 15 presents the results of the gravity equation estimation; Table 16 compares the 2015 and 2011 online trade data and the geographically corrected and not-corrected data. The first column in Table 15 shows aggregate results for the EU countries; columns two and three show results for goods and online digital media content respectively. The results are consistent with what we expected a priori. First, the distance elasticity is negative (-0.598), indicating that trade costs are relevant. The coefficient is somewhat higher than it is when estimated using the data from a 2011 EU e-commerce consumer survey (-0.332 in Table 16). The value of the distance elasticity is considerably smaller for online digital media content (-0.0717). A similar very weak distance effect (-0.055) for digital content was found for digital albums based on iTunes data (Gomez et al., 2015). This can be attributed to the fact that digital media do not entail physical delivery costs that depend on geographic distance. The survey data therefore confirm that distance matters much less for digital content.

Shared cultural traits should have a positive effect on bilateral trade flows. This is confirmed by contiguity (shared border) and shared language coefficients in the gravity regressions. Again, the value of the coefficients is lower for online digital media content than for goods. This implies that shared cultural traits matter less for digital media content than for goods. This may be due to 'superstar' effects, which are prevalent in cultural industries. We have experimented with different language distance variables (Melitz et al., 2014). This confirmed the robustness of the results.

Finally, we find that home bias is significant, meaning that consumers show strong preferences for the products sold domestically. A home bias coefficient of 3.765 implies that consumers are 43 times ($e^{3.765}$=43) more likely to buy a product from a domestic online seller than a foreign one. In this respect, there are no significant differences between goods and online content. A paradox of online trade is that, even though e-commerce and cross-border trade online significantly reduce trade costs, consumers show strong preferences for their home country sellers. This creates an important demand-driven obstacle to intra-EU online trade that cannot be addressed through regulatory and trade cost reducing policy measures (Gomez et al, 2014).

Comparing the 2011 and 2015 gravity estimates for goods, we can see that the home bias decreases somewhat, while the distance effect increases considerably (Table 16). This would indicate that in the online world, domestic purchases have become less important while cross-border purchases focus more on nearby countries. When we add the gravity estimation of the geographically corrected trade matrix to this picture, we observe a further decrease in home bias and a decrease of the distance effect. Taking into account the important caveats in the interpretation of the corrected gravity matrix, we refrain from drawing any firm conclusions from these results.

5. Clickstream Data

As an add-on to the survey, clickstream data for two countries (Belgium and Poland) were collected from approximately 500 respondents each, which gave us the unique opportunity to compare the survey results with actual clickstreaming behaviour. As a first comparison, we matched the websites of the survey with the website location database (as discussed in Section 2.2). In this case, because the website addresses are fully provided by the clickstream recording and we could match nearly 99% of the 61,417 different websites in the clickstream dataset. The diversification of websites is nearly identical between the countries, the Belgian and Polish participants clicked on 31,989 and 31,808 different websites respectively. Almost all websites are only used in one of the two countries (96%), while only 4% of the websites are used in both countries. This could potentially point to a rather dispersed digital single market, but in fact this finding is in line with previous studies (Alaveras et al., 2015), which show that the majority of local websites form part of

the long tail of websites, which only accumulate a few of the total number of clicks. While only a few large international platforms (YouTube, facebook etc.) are used in most countries, they receive most of the total number of clicks.

To obtain some cross-tabulations for clickstreaming behaviour, we create different subgroups from information obtained from the core and diary survey. A descriptive summary of these subgroups is given in Table 17. The first section "Purchases according to diary" divides the sample into whether purchases were completed during the time the online behaviour was recorded. 62% of the clickstreaming participants bought a good online, only marginally more (66%) bought a good offline during the same period. Interestingly services[14] were bought more often online (29.9%) than offline (10%). Most participants consumed some form of digital content online (90%), but only 27% paid for this consumption.

Table 18 compares the average time spent online. Reassuringly, we find that observed clickstream data confirms claims made by those respondents in the core survey who say they spend less time on the internet per day. Furthermore, as expected, younger and older people spend more time online than the age group "35-54", which has the highest work force participation. Furthermore purchasers always spend more time online than non-purchasers. This is also the case, albeit to a lesser extent, for offline purchases. How far this is related to actual online research regarding the products may be revealed by further analysis of the clickstream data and used categories.

Table 20 shows how the recorded time spent online is allocated between websites based in the home country, in the EU or outside the EU (as identified by the website database). Firstly, we see that a much higher percentage of users in Poland click on websites of their own country than they do in Belgium. Once more, language is an obvious explanation, as Belgium, unlike Poland, shares its main two languages with big neighbouring countries. The home bias also tends to increase with purchases undertaken. An interesting, and less expected result is that the higher the respondents' education, the more time they spend on websites of their own country. One likely explanation is that these groups use local websites more often than they use international platforms for social networks.

In a further table we calculated the average time spent by Belgian or Polish respondents on websites from different countries and compared this with the times spent from the country matrix (Table 20). We would expect the same cultural and language barriers for both behaviours. However, Table 20 reveals that these barriers are greater when respondents make purchases than they are when they just click on websites. The percentage of e-commerce expenditure by Belgians on

[14] As in Section 3, "services" here includes booking travel services or buying tickets.

Belgian websites (according to their response on the location) is 62%, though they only spend 40% of their time online on these sites. The difference in Poland is smaller but at a higher level: 80% of e-commerce expenditure by Poles happens on Polish websites during 72% of their online time. Both countries exhibit exceptionally high e-commerce home-bias, compared to other EU countries. Most of the time on foreign websites is spent in countries that share a language or on US websites, which are usually platforms that contain local information in a local language (in both countries, the most popular US websites are YouTube and facebook). Regarding e-commerce, most money spent outside the home country goes to European web shops.

6. Conclusions

In this study, we used online consumer survey data for the EU28 to gauge the relative importance of various drivers and impediments to shifting from offline to online and cross-border shopping for goods and digital media content. The questionnaire covered the three traditional economic drivers for shifting to online purchases: lower prices, more variety and lower transaction costs. It included demographic variables that enabled us to control for possible sample bias. Moreover, it enabled us to correct subjective consumer perceptions on where they buy with the objective geographic location of the online shop.

We find that a fairly robust set of factors motivate consumers to shift their purchases from offline to online shops, both for goods and for digital media content. As predicted by economic theory, prices, variety and transaction costs are the main drivers of that shift. These drivers work both at the extensive (number of consumers) and the intensive (volume of trade) margin for goods. Economic theory is less clear about the drivers for cross-border trade and this is reflected in the outcomes of the survey. The regressions suggest that variety more than price seem to be the main motivating factor to buy goods online in other countries at both the extensive and intensive margin (number of consumers). At the intensive margin, transaction costs come into play again. The picture is less clear for online purchases of digital media content. Some transaction cost issues play a role for domestic purchases and variety motives seem to work for cross-border purchases. However, there is no consistent picture across all questions in the survey and across the intensive and extensive margins.

The EU policy objective, under the Digital Agenda, for 50% of all consumers to buy online has already been reached. The consumer survey confirms that there are indeed strong economic incentives for consumers to shift their purchases from offline to online shops. However, cross-border online consumption remains below the target of 20% in the official statistics. By cross-checking survey information with the actual websites the respondents have bought from, we find that survey statistics, though not completely precise, are to a large extent reliable, though cross-

border purchases outside the EU may be underreported. This survey confirms that consumer incentives to go cross-border are more difficult to pinpoint. Price, quality and variety all seem to matter, though quality and variety in choice seem to be the major drivers for going cross-border. Under the new Digital Single Market policy package, EU policy makers seek to promote initiatives that would facilitate more cross-border online trade in the Digital Single Market. Policy makers do not need to focus so much on the positive incentives that consumers receive through market forces. Instead, they need to look at consumer concerns that stop them from buying online and cross-border. There is some evidence that consumers lack both knowledge about their rights and trust in cross-border transactions. Worries about data misuse or payment card details being stolen seem to be an obstacle to a seamless European digital market. Long delivery times also seem to be an issue with many online consumers.

In the absence of any reliable statistics on cross-border online trade in goods and services, the consumer survey data also enabled us to estimate a bilateral online trade matrix between the EU28. With the help of the standard gravity model, we find that around 85% of the observed trade patterns are determined by consumer preference variables, such as preference for the home market, language and geographic proximity (neighbouring countries). This would suggest that there is relatively little room left for policy makers to further facilitate this consumer welfare-enhancing shift to online and cross-border shopping.

Furthermore, the clickstream data reveal that the home bias is larger for shopping than surfing behaviour and that online and offline shoppers spend more time on the internet than non-shoppers. Further scrutiny of the clickstream data and linking the information to the online purchases revealed in the diary may allow estimation of online search costs.

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ANNEX II: TABLES

Table 1: Comparing consumer perception and actual location of websites

A: 28 EU countries, Information on Last Purchase from Core Survey

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	63.1%	**84.0%**	7.3%	8.7%
From a seller or service provider based in another EU country	18.9%	20.6%	**56.6%**	22.8%
From a seller or service provider based outside the EU	9.6%	9.6%	10.5%	**80.0%**
do not know	8.3%	53.3%	17.7%	29.1%
in total %		62.3%	17.8%	19.9%

Notes: for n=8816 (unweighted), respondents who entered a valid URL and answered the question of the location of where the product was bought.

B: Belgium and Poland, Information on Last Purchase from Core Survey

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	66.4%	**89.4%**	7.5%	3.2%
From a seller or service provider based in another EU country	20.4%	16.8%	**71.4%**	11.9%
From a seller or service provider based outside the EU	4.1%	13.5%	18.9%	**67.6%**
do not know	9.1%	68.3%	18.3%	13.4%
in total %		69.5%	22.0%	8.5%

Notes: for n=905 (unweighted)

C: Belgium and Poland, Information from Clickstream Diary

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	64.5%	**90.0%**	6.6%	3.4%
From a seller or service provider based in another EU country	16.4%	13.3%	**72.2%**	14.6%
From a seller or service provider based outside the EU	4.3%	14.3%	2.4%	**83.3%**
do not know	14.8%	37.1%	16.8%	46.2%
in total %		66.4%	18.6%	15.0%

Notes: for n=966 purchases from 524 different respondents (unweighted) from clickstream diary.

Table 2: Comparing consumer perception and actual location of websites (by product group)

A: Tangible Goods

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	63.1%	**84.4%**	7.2%	8.4%
From a seller or service provider based in another EU country	19.1%	22.0%	**56.6%**	21.4%
From a seller or service provider based outside the EU	10.3%	9.6%	10.1%	**80.4%**
do not know	7.5%	57.1%	16.1%	26.8%
in total %		62.7%	17.6%	19.6%

Notes: for n=7442 (unweighted)

B: Online Services (Travel, Leisure)

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	71.8%	**83.2%**	8.4%	8.4%
From a seller or service provider based in another EU country	16.1%	10.8%	**60.5%**	28.7%
From a seller or service provider based outside the EU	2.4%	17.4%	21.7%	**60.9%**
do not know	9.8%	54.2%	24.0%	21.9%
in total %		67.1%	18.6%	14.2%

Notes: for n=977 (unweighted)

C: Digital Content

		According to Website database correct answer in %		
By answer given by respondent	**in % total**	in my country	another EU	outside the EU
From a seller or service provider based in my country of residence	42.8%	**75.9%**	6.5%	17.6%
From a seller or service provider based in another EU country	21.4%	15.3%	**48.2%**	36.5%
From a seller or service provider based outside the EU	15.4%	6.6%	11.5%	**82.0%**
do not know	20.4%	25.9%	21.0%	53.1%
in total %		42.1%	19.1%	38.8%

Notes: for n=397 (unweighted)

Table 3: Perception of website location within last year

% of consumers buy this product group	**Goods (e.g. Books, Clothes,etc.)**	**Book Services (hotels, tickets)**	**Digital Content (Films, Games,**
only domestic	47.8	62.1	50.3
crossborder	44.7	28.3	32.6
online, but do not know where provider is based	7.4	9.7	17

Notes: Weighted Averages.

Table 4: Descriptive Statistics of Explanatory Variables

VARIABLES	Observations	Mean	Min	Max
CONCERNS				
Delivery conditions				
Long delivery times	22,756	0.18	0	1
Delivery costs or final price are higher than displayed on website	22,756	0.13	0	1
Delivery arrangements of online sellers might not be convenient for me	22,756	0.08	0	1
Wrong or damaged products will be delivered	22,756	0.26	0	1
Products will not be delivered at all	22,756	0.17	0	1
Customer service				
Customer service is poor	22,756	0.13	0	1
Returning a product I didn't like and getting reimbursed is not easy	22,756	0.22	0	1
Replacement or repair of a faulty product is not easy	22,756	0.25	0	1
Payment				
The payment card details may be stolen	22,756	0.26	0	1
My preferred payment method might not be accepted by online sellers	22,756	0.11	0	1
Trust				
Personal data may be misused	22,756	0.30	0	1
Goods sold online might be unsafe/counterfeit	22,756	0.19	0	1
I don't trust the information provided to me online	22,756	0.05	0	1
I don't trust the terms and conditions I have to agree with online	22,756	0.06	0	1
Consumer Rights				
I do not know what my consumer rights are when buying online	22,756	0.07	0	1
There is a lower level of consumer protection when buying online	22,756	0.03	0	1
I don't understand the terms and conditions	22,756	0.04	0	1
REASONS				
Price				
I find cheaper products online	22,554	0.49	0	1
Quality and variety				
I find better quality products online	22,554	0.05	0	1
I can find certain products only online	22,554	0.25	0	1
There's more choice online	22,554	0.36	0	1
Transaction				
I save time by buying online	22,554	0.42	0	1
I don't like going to shops	22,554	0.12	0	1
I can order at any time of the day/week	22,554	0.49	0	1
Products are delivered to a convenient place	22,554	0.24	0	1
I can return products easily	22,554	0.09	0	1
Information				
It's easier to compare prices online	22,554	0.37	0	1
It's easier to compare product information online	22,554	0.20	0	1
I can find more information online	22,554	0.18	0	1
I can find product reviews by other consumers	22,554	0.21	0	1
ICT USE AND SKILLS				
hoursinternet	22,756	4.02	0	23
socialnetwork	22,756	0.69	0	1
advanced	22,756	0.38	0	1
DEMOGRAPHICS				
age (in years)	22,756	41.97	18	99
gender (1=female)	22,756	0.49	0	1
No. of languages spoken	22,756	1.70	0	5
Categorical Variables	Frequency	Percent		
Education	22,756			
Elementary School	1,060	4.66		
Some Secondary School	3,677	16.16		
Graduation Secondary School	6,945	30.52		
Graduation College	6,313	27.74		
Post-graduate Degree	2,961	13.01		
Student	852	3.74		
Other	594	2.61		
Refusal	354	1.56		
Region	22,756			
Rural Zone	7,319	32.16		
Town, Urban centre	9,313	40.92		
Metropolitan zone	6,124	26.91		

Table 5a: The extensive margin of online trade (the number of consumers doing online trade, logit regression)

	Dependent Variable						
	Purchase goods online		Online services		Purchase digital content online		
	Total	Crossborder	Total	Crossborder	Total	Crossborder	Paid content
Mean Population	93.2%	50.1%	77.0%	34.5%	97.0%	45.6%	44.5%
CONCERNS							
Delivery conditions							
Long delivery times	**0.00864*** **	**0.0370** **	0.00147	-0.0113	0.000902	-0.0302*	-0.0236
Delivery costs or final price are higher than displayed on website	**-0.00762*** **	-0.0237	-0.000194	-0.00521	-0.00268	0.0127	0.0212
Delivery arrangements of online sellers might not be convenient for me	0.00560	0.0248	0.0166	0.0361*	0.00470	0.0365*	0.0214
Wrong or damaged products will be delivered	6.46e-05	**-0.0528*** **	-0.00929	-0.0233	-0.00155	**-0.0369*** **	**-0.0288** **
Products will not be delivered at all	**-0.00510** **	-0.0107	**-0.0219** **	-0.0220	-0.00201	-0.0197	-0.0158
Customer service							
Customer service is poor	-0.00143	0.0255	**0.0276** **	0.00880	0.00168	0.0261	0.0308*
Returning a product I didn't like and getting reimbursed is not easy	-0.00383	-0.0263*	-0.00791	-0.0178	**0.00831*** **	**-0.0364** **	**-0.0508*** **
Replacement or repair of a faulty product is not easy	-0.00344	-0.0141	0.00535	-0.0147	**0.00825*** **	**-0.0300** **	-0.0258*
Payment							
The payment card details may be stolen	**-0.0123*** **	**-0.0410*** **	-0.00278	-0.0173	0.00373	**-0.0397*** **	**-0.0291** **
My preferred payment method might not be accepted by online sellers	-0.00177	0.0178	**-0.0278** **	-0.0206	0.00544	**0.0369** **	-0.00818
Trust							
Personal data may be misused	**-0.00574** **	**-0.0421*** **	-0.0120	**-0.0471*** **	0.00373	-0.0397***	-0.0291**
Goods sold online might be unsafe/counterfeit	**-0.00791*** **	0.0127	-0.0172*	-0.0105	0.00544	0.0369**	-0.00818
I don't trust the information provided to me online	**-0.0177*** **	0.0237	-0.0265*	0.0263	0.00373	**-0.0397*** **	-0.0291**
I don't trust the terms and conditions I have to agree with online	**-0.00945*** **	0.00706	0.0224	**0.0662*** **	0.00544	0.0369**	-0.00818
Consumer Rights							
I do not know what my consumer rights are when buying online	**-0.00755** **	-0.0373	0.0137	-0.0184	**-0.00801** **	-0.0198	-0.00985
There is a lower level of consumer protection when buying online	**-0.00774*** **	-0.00409	0.00153	0.00344	0.000890	**0.0490** **	0.0161
I don't understand the terms and conditions	-0.00429	0.0341	0.0281	**0.0929*** **	-0.00349	0.0256	0.0265
Other concerns	-0.00520	-0.0394	**-0.0368** **	0.00741	**0.0119** **	-0.0523*	-0.0414
REASONS							
Price							
I find cheaper products online	**0.0137*** **	-0.0120	-0.00790	**-0.0618*** **	0.00382	-0.0160	**-0.0623*** **
Quality and variety							
I find better quality products online	0.0115*	**0.0807*** **	**0.0379***	**0.0776*** **	0.00343	0.0484*	**0.104*** **
I can find certain products only online	**0.0128*** **	0.0270*	-0.0187*	-0.0185	0.00153	0.0269*	0.0269*
There's more choice online	**0.00984*** **	**0.0277** **	-0.00270	-0.0245*	0.000858	0.00167	0.0118
Transaction							
I save time by buying online	**0.00877*** **	**-0.0407*** **	0.00637	**-0.0441*** **	0.00316	**-0.0518*** **	-0.00468
I don't like going to shops	**0.0136*** **	0.0125	-0.0176	**0.0386** **	0.00482	0.0151	0.0370*
I can order at any time of the day/week	**0.00541** **	-0.00239	0.00180	**-0.0342** **	0.00352	-0.0223	-0.0242*
Products are delivered to a convenient place	**0.0198*** **	-0.00776	-0.00873	0.00474	0.00318	0.00841	0.0108
I can return products easily	**0.0102** **	0.00759	0.0237	0.0106	-0.00501	-0.00853	0.0113
Information							
It's easier to compare prices online	**0.00521** **	-0.0178	**0.0180** **	**-0.0363*** **	**0.00547** **	-0.0121	-0.0217*
It's easier to compare product information online	0.00387	0.0101	**0.0347*** **	-0.0243	-7.78e-05	0.0285*	**0.0368** **
I can find more information online	0.000738	-0.0121	0.000300	-0.0161	0.00490	0.0233	**0.0321** **
I can find product reviews by other consumers	**0.00953*** **	0.0291*	0.00793	0.0151	**0.0106*** **	0.0181	**0.0445*** **
Other	**-0.0256*** **	**-0.134*** **	**-0.156*** **	-0.0573	-0.00767*	-0.0218	**-0.156*** **
ICT USE AND SKILLS							
hoursinternet	**0.00118** **	**0.00703*** **	-0.00184	**0.00448** **	0.000256	**0.00517** **	**0.00934*** **
socialnetwork	-0.000154	**-0.0520*** **	0.00919	**-0.0790*** **	**0.0159*** **	-0.0242	**-0.0356** **
advanced	**0.0187*** **	**0.177*** **	**0.133*** **	**0.120*** **	**0.0229*** **	**0.172*** **	**0.233*** **
DEMOGRAPHICS							
age (in years)	**-0.000359*** **	**-0.00718*** **	**-0.00157*** **	**-0.00553*** **	**-0.000204** **	**-0.00756*** **	**-0.00650*** **
gender (1=female)	0.00236	**-0.0525*** **	0.00112	**-0.0471*** **	**-0.00447** **	**-0.122*** **	**-0.0755*** **
Education (Base: Elementary School)							
Some Secondary School	0.000982	-0.0231	**0.0768** **	-0.0808*	0.00543	-0.0531	-0.000272
Graduation Secondary School	0.0116	0.0153	**0.140*** **	-0.0771*	0.00879	-0.0248	0.0198
Graduation College	**0.0184** **	0.0476	**0.194*** **	-0.0399	**0.0161*** **	-0.00806	0.0560
Post-graduate Degree	**0.0258*** **	0.0691*	**0.229*** **	0.0262	0.0130*	0.0470	**0.127*** **
Student	0.0155	0.0101	**0.155*** **	-0.0698	0.00691	-0.0141	-0.0542
Other	0.00698	0.0127	0.0825*	0.00512	0.0153*	-0.0500	0.0112
Refusal	-0.00701	0.0323	**0.121** **	0.0551	-0.00189	-0.0812	0.110*
Region (Base=Rural)							
Town, Urban centre	0.00337	**0.0418** **	**0.0811*** **	**0.0543*** **	0.00299	**0.0826*** **	**0.0652*** **
Metropolitan zone	**0.00594** **	0.00197	**0.0289** **	0.0159	**0.00548** **	0.0312*	0.00424
No. of languages spoken	0.00147	**0.0586*** **	**0.0452*** **	**0.0433*** **	**0.00687*** **	**0.0819*** **	0.00851
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,605	16,351	18,605	13,145	18,148	15,504	18,053

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Estimated with a maximum-likelihood logit model. Marginal effects at mean population shown. Weights based on age, gender, and country applied.

Table 5b: The extensive margin of online trade (Odds Ratios)

	Dependent Variable						
	Purchase goods online		Online services		Purchase digital content online		
	Total	Crossborder	Total	Crossborder	Total	Crossborder	Paid content
CONCERNS							
Delivery conditions							
Long delivery times	**1.546*** **	**1.159** **	1.010	0.948	1.055	0.881*	0.910
Delivery costs or final price are higher than displayed on website	**0.681*** **	0.910	0.999	0.976	0.852	1.055	1.089
Delivery arrangements of online sellers might not be convenient for me	1.326	1.104	1.121	1.187*	1.323	1.165*	1.090
Wrong or damaged products will be delivered	1.003	**0.810*** **	0.938	0.896	0.912	**0.857*** **	**0.891** **
Products will not be delivered at all	**0.774** **	0.958	0.861**	0.901	0.887	0.921	0.939
Customer service							
Customer service is poor	0.930	1.107	**1.208** **	1.043	1.105	1.115	1.131*
Returning a product I didn't like and getting reimbursed is not easy	0.825	0.900*	0.947	0.919	**1.640*** **	**0.859** **	**0.816*** **
Replacement or repair of a faulty product is not easy	0.841	0.945	1.037	0.933	**1.634*** **	**0.882** **	0.902*
Payment							
The payment card details may be stolen	**0.539*** **	**0.849*** **	0.981	0.921	1.248	**0.847*** **	**0.890** **
My preferred payment method might not be accepted by online sellers	0.915	1.074	**0.827** **	0.907	1.382	**1.167** **	0.968
Trust							
Personal data may be misused	**0.749*** **	**0.845*** **	0.921	**0.800*** **	1.144	0.908	0.949
Goods sold online might be unsafe/counterfeit	**0.672*** **	1.052	0.889*	0.952	1.195	0.969	0.899*
I don't trust the information provided to me online	**0.410*** **	1.099	0.834*	1.133	1.095	**1.383*** **	1.121
I don't trust the terms and conditions I have to agree with online	**0.621*** **	1.029	1.166	**1.369*** **	0.994	1.224*	1.062
Consumer Rights							
I do not know what my consumer rights are when buying online	**0.684** **	0.861	1.098	0.916	**0.621** **	0.921	0.961
There is a lower level of consumer protection when buying online	**0.677*** **	0.984	1.011	1.016	1.054	**1.228** **	1.067
I don't understand the terms and conditions	0.806	1.146	1.212	**1.553*** **	0.813	1.113	1.112
Other concerns	0.770	0.854	**0.778** **	1.036	**2.032** **	0.803*	0.847
REASONS							
Price							
I find cheaper products online	**1.991*** **	0.953	0.947	**0.746*** **	1.255	0.935	**0.779*** **
Quality and variety							
I find better quality products online	1.786*	**1.381*** **	1.296*	**1.444*** **	1.226	1.225*	**1.519*** **
I can find certain products only online	**1.908*** **	1.114*	0.880*	0.916	1.095	1.119*	1.114*
There's more choice online	**1.641*** **	**1.117** **	0.982	0.890*	1.052	1.007	1.048
Transaction							
I save time by buying online	**1.555*** **	**0.850*** **	1.045	**0.811*** **	1.207	**0.805*** **	0.981
I don't like going to shops	**1.979*** **	1.051	0.886	**1.201** **	1.332	1.065	1.160*
I can order at any time of the day/week	**1.313** **	0.990	1.012	**0.850** **	1.233	0.911	0.908*
Products are delivered to a convenient place	**2.710*** **	0.969	0.942	1.023	1.208	1.036	1.044
I can return products easily	**1.667** **	1.031	1.176	1.051	0.742	0.965	1.046
Information							
It's easier to compare prices online	**1.300** **	0.931	**1.131** **	**0.842*** **	**1.385** **	0.951	0.917*
It's easier to compare product information online	1.215	1.041	**1.268*** **	0.891	0.995	1.126*	**1.159** **
I can find more information online	1.038	0.953	1.002	0.927	1.338	1.102	**1.137** **
I can find product reviews by other consumers	**1.616*** **	1.124*	1.056	1.074	**1.882*** **	1.079	**1.195*** **
Other	**0.275*** **	**0.586*** **	**0.343*** **	0.762	0.634*	0.913	**0.535*** **
ICT USE AND SKILLS							
hoursinternet	**1.061** **	**1.029*** **	0.988	**1.021** **	1.015	**1.022** **	**1.038*** **
socialnetwork	0.992	**0.812*** **	1.065	**0.688*** **	**2.578*** **	0.904	**0.867** **
advanced	**2.562*** **	**2.030*** **	**2.482*** **	**1.763*** **	**3.916*** **	**2.054*** **	**2.545*** **
DEMOGRAPHICS							
age (in years)	**0.982*** **	**0.972*** **	**0.989*** **	**0.974*** **	**0.988** **	**0.969*** **	**0.974*** **
gender (1=female)	1.126	**0.811*** **	1.008	**0.800*** **	**0.766** **	**0.601*** **	**0.739*** **
Education (Base: Elementary School)							
Some Secondary School	1.030	0.911	**1.446** **	0.683*	1.245	0.798	0.999
Graduation Secondary School	1.514	1.063	**2.076*** **	0.696*	1.464	0.902	1.083
Graduation College	**2.139*** **	1.210	**3.065*** **	0.834	**2.359*** **	0.967	1.252
Post-graduate Degree	**3.869*** **	1.319*	**4.218*** **	**1.120**	**1.880** **	1.211	**1.667*** **
Student	1.819*	1.041	**2.287*** **	0.722	1.333	0.943	0.799
Other	1.257	1.052	1.490*	1.023	2.221	0.809	1.046
Refusal	0.827	1.138	**1.844** **	1.265	0.936	0.705	1.558*
Region (Base=Rural)							
Town, Urban centre	1.168	**1.182** **	**1.753*** **	**1.294*** **	1.174	**1.414*** **	**1.299*** **
Metropolitan zone	**1.338** **	1.008	**1.195** **	1.081	**1.373** **	1.143*	1.017
No. of languages spoken	1.077	**1.264*** **	**1.363*** **	**1.228*** **	**1.505*** **	**1.409*** **	1.035
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	12.91***	8.037***	1.087	5.087***	2.057*	3.461***	1.674**
Observations	18,605	16,351	18,605	13,145	18,148	15,504	18,053

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Estimated with a maximum-likelihood logit model. Odds Ratios shown. Ratios > 1 correspont to positive effects. Weights based on age, gender, and country applied.

Table 6: The extensive margin of online cross-border trade (the number of consumers doing online trade, logit regression), intra and extra EU

	Dependent Variable (Buying Cross-border)					
	Purchase goods online		Online services		Purchase digital content online	
	EU	WW	EU	WW	EU	WW
CONCERNS						
Delivery conditions						
Long delivery times	0.0169	0.0159	-0.00703	-0.00918	**-0.0296****	-0.0247*
Delivery costs or final price are higher than displayed on website	-0.0157	-0.00616	-0.0107	0.00233	0.0108	-0.00423
Delivery arrangements of online sellers might not be convenient for me	**0.0468****	-0.00593	0.0233	0.0146	**0.0455****	0.0274
Wrong or damaged products will be delivered	**-0.0422*****	**-0.0293****	-0.0143	-0.0131	-0.0212	**-0.0203***
Products will not be delivered at all	-0.0113	-0.0103	-0.0212	-0.00525	-0.00133	-0.00977
Customer service						
Customer service is poor	0.0301*	0.0115	0.0118	**-0.0223****	**0.0414****	0.00391
Returning a product I didn't like and getting reimbursed is not easy	**-0.0320****	**-0.0269****	-0.00673	**-0.0227****	**-0.0333****	**-0.0269****
Replacement or repair of a faulty product is not easy	-0.0243*	-0.0206*	-0.00665	-0.00517	**-0.0353*****	-0.0184
Payment						
The payment card details may be stolen	**-0.0430*****	**-0.0393*****	-0.0180	-0.0176*	**-0.0344****	**-0.0491*****
My preferred payment method might not be accepted by online sellers	0.0150	0.0114	-0.0288*	0.00439	**0.0405****	**0.0315****
Trust						
Personal data may be misused	**-0.0385*****	**-0.0315****	**-0.0374*****	-0.0102	**-0.0225***	-0.0124
Goods sold online might be unsafe/counterfeit	0.00723	0.00714	0.00124	-0.00133	0.00130	-0.000929
I don't trust the information provided to me online	0.0439*	0.0105	0.00227	**0.0334****	**0.0753*****	**0.0704*****
I don't trust the terms and conditions I have to agree with online	0.0122	0.00918	**0.0487****	**0.0390*****	**0.0524****	0.0244
Consumer Rights						
I do not know what my consumer rights are when buying online	-0.0139	-0.0217	-0.0174	3.13e-05	0.00438	-0.00739
There is a lower level of consumer protection when buying online	5.24e-05	0.00569	-0.000635	0.0103	**0.0586*****	0.0271
I don't understand the terms and conditions	**0.0630****	**0.0570****	**0.0688*****	**0.0504*****	0.0334	0.0124
Other concerns	-0.0379	-0.0157	0.0150	0.00242	**-0.0650****	-0.0101
REASONS						
Price						
I find cheaper products online	**-0.0342****	-0.0143	**-0.0406*****	**-0.0332*****	**-0.0260****	**-0.0271****
Quality and variety						
I find better quality products online	**0.119*****	**0.0520****	**0.0619*****	**0.0320****	**0.0660****	**0.0457****
I can find certain products only online	0.00290	0.0192	-0.00864	**-0.0196****	0.00850	0.00828
There's more choice online	**0.0364*****	-0.00682	-0.00563	-0.0123	-0.0195	-0.00235
Transaction						
I save time by buying online	**-0.0350*****	**-0.0477*****	**-0.0333*****	**-0.0198****	**-0.0532*****	**-0.0427*****
I don't like going to shops	0.0155	0.0255	**0.0470*****	0.0172	0.00942	**0.0309****
I can order at any time of the day/week	0.00175	-0.0140	**-0.0270****	**-0.0265*****	**-0.0335*****	-0.00413
Products are delivered to a convenient place	-0.00765	-0.0124	-0.00461	0.0170*	0.0127	0.00201
I can return products easily	0.0173	0.0188	0.00693	-0.00819	-0.00375	-0.00873
Information						
It's easier to compare prices online	-0.0204	-0.0169	**-0.0260****	**-0.0169****	-0.00736	-0.0171
It's easier to compare product information online	-0.000308	-0.00179	-0.00783	-0.0181*	0.0153	0.0233*
I can find more information online	0.00679	0.000120	-0.0116	0.00235	0.0157	0.00683
I can find product reviews by other consumers	0.0107	0.0246*	0.0176	0.00620	0.0122	0.00972
Other	**-0.111****	-0.0648	-0.0335	-0.0288	-0.0630	-0.0173
ICT USE AND SKILLS						
hoursinternet	**0.00687*****	**0.00367****	0.00333*	-0.000242	0.00730***	0.00277
socialnetwork	**-0.0360****	**-0.0561*****	**-0.0422*****	**-0.0301*****	-0.0175	**-0.0415*****
advanced	**0.174*****	**0.121*****	**0.0978*****	**0.0389*****	**0.159*****	**0.102*****
DEMOGRAPHICS						
age (in years)	**-0.00658*****	**-0.00625*****	**-0.00433*****	**-0.00242*****	**-0.00692*****	**-0.00603*****
gender (1=female)	**-0.0494*****	**-0.0382*****	**-0.0363*****	**-0.0264*****	**-0.105*****	**-0.0845*****
Education (Base: Elementary School)						
Some Secondary School	-0.0199	-0.0287	-0.0700	-0.0536*	-0.0533	-0.0120
Graduation Secondary School	0.0264	-0.0185	-0.0626	-0.0312	-0.0303	-0.00619
Graduation College	0.0539	0.00228	-0.0256	-0.0299	-0.0240	0.00462
Post-graduate Degree	**0.0912****	0.00934	0.0303	-0.0123	0.0303	0.0441
Student	-0.00189	-0.00631	-0.0338	-0.0354	-0.0551	0.0172
Other	0.00214	0.00112	0.0322	-0.0278	**-0.104****	0.0401
Refusal	0.00658	0.0495	0.0893	-0.0304	-0.0633	-0.0764*
Region (Base=Rural)						
Town, Urban centre	**0.0410****	**0.0364****	**0.0557*****	0.00362	**0.0829*****	**0.0522*****
Metropolitan zone	0.00572	0.000821	0.0137	0.00162	0.0299*	0.00897
No. of languages spoken	**0.0535*****	**0.0375*****	**0.0410*****	**0.0137*****	**0.0692*****	**0.0558*****
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,351	16,351	13,145	13,145	15,504	15,504

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Estimated with a maximum-likelihood logit model. Marginal effects at mean population shown. Weights based on age, gender, and country applied. WW: Online shopper buys at least one Worldwide (outside EU). EU: online shopper purchases at least one within EU.

Table 7: Intensive margin of online trade (volume of expenditure in euro, OLS regression)

	Dependent Variable			Dependent Variable		
	Goods and Travel Services			Online Digital Content		
VARIABLES	total	domestic	crossborder	total	domestic	crossborder
CONCERNS						
Delivery						
Long delivery times	0.0345	0.0400	-0.0432	0.0448	0.0639	0.371
Delivery costs or final price are higher than displayed on website	-0.0179	-0.0602	0.0845	0.0890	0.0720	0.0519
Delivery arrangements of online sellers might not be convenient for me	-0.00974	-0.115	-0.00817	-0.0104	0.0673	-0.197
Wrong or damaged products will be delivered	-0.0298	-0.0451	0.0109	-0.00747	0.0370	-0.278
Products will not be delivered at all	**-0.0750****	-0.0667	**-0.136****	-0.00795	-0.0196	**-0.570***
Customer service						
Customer service is poor	**0.105****	-0.0227	**0.165****	0.113*	0.143*	0.159
Returning a product I didn't like and getting reimbursed is not easy	-0.00840	0.00257	-0.0170	0.0574	0.0477	0.276
Replacement or repair of a faulty product is not easy	0.0509	0.0943	0.0822	0.00589	0.0910	-0.431
Payment						
The payment card details may be stolen	-0.0110	0.0335	-0.0132	-0.0135	0.0177	-0.177
My preferred payment method might not be accepted by online sellers	-0.0214	0.0661	**-0.218****	**0.107**	0.0112	0.368
Trust						
Personal data may be misused	0.0181	0.0349	0.0508	0.0572	0.126*	0.162
Goods sold online might be unsafe/counterfeit	**-0.0862****	-0.126	0.00226	0.0383	0.109	-0.165
I don't trust the information provided to me online	-0.107	-0.217*	0.0393	0.0839	-0.210	0.303
I don't trust the terms and conditions I have to agree with online	-0.0755	-0.154	-0.0722	0.151*	-0.0862	0.258
Consumer Rights						
I do not know what my consumer rights are when buying online	**-0.119****	-0.169	-0.0953	-0.127	-0.353	0.151
There is a lower level of consumer protection when buying online	0.0235	0.0609	0.0737	**0.220*****	**0.379*****	**0.744*****
I don't understand the terms and conditions	**-0.257*****	-0.322*	-0.0102	0.0320	-0.225	-0.460
Other concerns	-0.122	-0.318	0.0885	-0.172	-0.0190	0.159
REASONS						
Price						
I find cheaper products online	**0.177*****	**0.261*****	0.0671	-0.105**	0.0219	-0.0101
Quality and variety						
I find better quality products online	0.0263	-0.390	**0.251****	**0.233*****	-0.00630	**0.723*****
I can find certain products only online	**0.135*****	0.103	**0.189*****	0.0530	0.0437	0.192
There's more choice online	**0.223*****	**0.211*****	**0.155*****	0.0658	0.00125	0.127
Transaction						
I save time by buying online	**0.136*****	**0.245*****	**0.114****	0.0549	**0.182*****	-0.153
I don't like going to shops	**0.352*****	**0.417*****	**0.362*****	0.106	0.0718	**0.742****
I can order at any time of the day/week	**0.240*****	**0.168****	**0.158*****	0.0935*	0.0734	-0.196
Products are delivered to a convenient place	**0.167*****	**0.157****	**0.147****	**0.127****	0.0609	0.447*
I can return products easily	0.0907	**0.220****	0.134	0.0838	0.0872	0.252
Information						
It's easier to compare prices online	**0.151*****	**0.209*****	**0.0981***	-0.00385	-0.00679	0.140
It's easier to compare product information online	**0.195*****	**0.293*****	**0.127***	0.00346	0.0342	**0.550****
I can find more information online	**0.207*****	0.114	**0.193*****	0.0656	-0.0584	-0.150
I can find product reviews by other consumers	**0.302*****	**0.303*****	**0.219*****	**0.113****	0.0864	0.0716
Other	**0.276****	**0.600*****	0.308	-0.269	-0.330	**1.859*****
ICT USE AND SKILLS						
hoursinternet	-0.00906	-0.0394*	0.0107	**0.0138****	-0.0143	**0.0742*****
socialnetwork	**0.165*****	**0.248*****	0.108	**0.222*****	**0.272****	0.280
advanced	**0.232*****	0.0308	**0.209*****	**0.273*****	0.106	**0.529****
DEMOGRAPHICS						
age (in years)	**0.00747*****	**0.0108*****	0.00342	**0.00763*****	**0.00956*****	0.00503
gender (1=female)	**-0.118*****	**-0.171****	**-0.122****	**-0.280*****	**-0.206*****	**-0.584*****
Education (Base: Elementary School)						
Some Secondary School	**0.338*****	0.266*	0.0678	0.263	0.239	0.247
Graduation Secondary School	**0.507*****	**0.518*****	**0.305****	**0.315****	**0.345****	0.0981
Graduaion College	**0.689*****	**0.650*****	**0.515*****	**0.323****	0.299	-0.415
Post-graduate Degree	**0.869*****	**0.577*****	**0.773*****	**0.453*****	0.350	-0.0884
Student	**0.336*****	**0.400****	0.224	0.0900	0.175	-0.470
Other	**0.398*****	**0.485*****	**0.513****	0.265	0.210	**1.640*****
Refusal	0.199	0.384*	0.319	-0.171	0.138	-0.803
Region (Base=Rural)						
Town, Urban centre	**0.112*****	-0.0372	**0.167****	**0.155****	-0.118	0.537
Metropolitan zone	0.0140	0.0824	0.00652	0.0919	0.0890	0.330
No. of languages spoken	**0.198*****	**0.123*****	**0.241*****	**0.170*****	**0.103****	**0.378*****
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Constant	4.195***	3.829***	3.947***	2.639***	2.642***	1.462**
Observations	17,784	14,654	9,774	7,989	5,883	3,268
R-squared	0.145	0.062	0.100	0.096	0.050	0.143

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Weights based on age, gender, and country applied.

Table 8: Cross-border Online Trade: Perception vs. Corrected Information

	Dependent Variable		
	Last Purchase Crossborder		
	Full Sample	Matched Sample	
VARIABLES	repsonse	response	corrected
CONCERNS			
Delivery conditions			
Long delivery times	**0.133***	0.0980	**0.309****
Delivery costs or final price are higher than displayed on website	0.0670	0.121	**0.210***
Delivery arrangements of online sellers might not be convenient for me	0.156	0.0720	-0.127
Wrong or damaged products will be delivered	-0.0919	-0.124	-0.145
Products will not be delivered at all	-0.0901	-0.0519	-0.0491
Customer service			
Customer service is poor	-0.0791	-0.114	0.184
Returning a product I didn't like and getting reimbursed is not easy	-0.0944	0.00594	**0.164***
Replacement or repair of a faulty product is not easy	-0.0564	0.0521	**-0.161***
Payment			
The payment card details may be stolen	**-0.117***	-0.101	0.0858
My preferred payment method might not be accepted by online sellers	0.0633	-0.0818	0.0690
Trust			
Personal data may be misused	**-0.201*****	-0.182	0.0435
Goods sold online might be unsafe/counterfeit	0.0541	0.133	-0.0292
I don't trust the information provided to me online	-0.1000	0.111	0.127
I don't trust the terms and conditions I have to agree with online	0.120	-0.00888	0.167
Consumer Rights			
I do not know what my consumer rights are when buying online	-0.0205	-0.0755	0.208
There is a lower level of consumer protection when buying online	0.119	**0.315****	0.0166
I don't understand the terms and conditions	**0.260***	**0.405***	0.131
Other concerns	0.0861	0.347	0.238
REASONS			
Price			
I find cheaper products online	0.0929	0.146	-0.0724
Quality and variety			
I find better quality products online	**0.240***	**0.628*****	-0.0295
I can find certain products only online	**0.335*****	**0.372*****	0.111
There's more choice online	-0.0294	0.0397	-0.0977
Transaction			
I save time by buying online	**-0.210*****	-0.106	**-0.206****
I don't like going to shops	**0.214****	**0.269***	-0.110
I can order at any time of the day/week	0.0508	0.0407	-0.0196
Products are delivered to a convenient place	**-0.129***	0.0923	**-0.275*****
I can return products easily	-0.0300	-0.148	-0.0831
Information			
It's easier to compare prices online	**-0.105***	0.0570	-0.0995
It's easier to compare product information online	0.0421	0.0319	**-0.256****
I can find more information online	-0.0841	-0.0246	-0.0796
I can find product reviews by other consumers	-0.0338	-0.145	-0.157
Other	-0.0909	-0.134	**-0.652****
ICT USE AND SKILLS			
hoursinternet	0.0138	0.0123	0.00349
socialnetwork	**-0.247*****	-0.129	-0.0492
advanced	**0.283*****	**0.250****	**0.267*****
DEMOGRAPHICS			
age (in years)	**-0.0165*****	**-0.0132*****	-0.00648
gender (1=female)	**-0.261*****	**-0.196***	-0.0260
Education (Base: Elementary School)			
Some Secondary School	-0.0101	-0.102	0.139
Graduation Secondary School	**0.307***	0.00413	-0.0180
Graduation College	**0.408****	-0.00760	0.0480
Post-graduate Degree	**0.419****	0.150	-0.0713
Student	**0.474****	0.393	0.0417
Other	0.190	0.0912	0.576
Refusal	**0.721****	0.518	0.396
Region (Base=Rural)			
Town, Urban centre	**0.167****	**0.262****	0.242*
Metropolitan zone	0.0639	0.200	0.190
No. of languages spoken	**0.180*****	**0.298*****	**0.235*****
Product Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Constant	-0.123	-0.569	-0.234
Observations	16,019	6,739	6,739

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Estimated with a maximum-likelihood logit model. Logit regression coefficients shown. Weights based on age, gender, and country applied.

Table 9: Principal component analysis of concern variables

	PC 1	PC 2	PC 3	PC 4	PC 5
	Cyber Crime	*Remedies*	*Conformity*	*Consumer protection*	*Refusal/ Higher prices*
Delivery conditions					
Long delivery times			0.5185		
Delivery costs or final price are higher than displayed on website					0.4572
Delivery arrangements of online sellers might not be convenient for me					0.4985
Wrong or damaged products will be delivered			0.4579		
Products will not be delivered at all			0.5753		
Customer service					
Customer service is poor					
Returning a product I didn't like and getting reimbursed is not easy		0.6411			
Replacement or repair of a faulty product is not easy		0.6454			
Payment					
The payment card details may be stolen	0.6417				
My preferred payment method might not be accepted by online sellers					0.631
Trust					
Personal data may be misused	0.6573				
Goods sold online might be unsafe/counterfeit					
I don't trust the information provided to me online				0.5021	
I don't trust the terms and conditions I have to agree with online				0.5246	
Consumer Rights					
I do not know what my consumer rights are when buying online				0.3909	
There is a lower level of consumer protection when buying online					
I don't understand the terms and conditions				0.495	

Notes: *Five retained principal components (PC) for Eigenevalue set at minimum of 1 displayed. Loadings < .3 not shown.*

Table 10: The extensive margin of online cross-border trade (the number of consumers doing online trade, logit regression), Concerns in 5 principal components

	Dependent Variable						
	Purchase goods online		Online services		Purchase digital content online		
	Total	Crossborder	Total	Crossborder	Total	Crossborder	Paid content
CONCERNS							
Cyber Crime	**-0.00733*** **	**-0.0272*** **	**-0.00849** **	**-0.0215*** **	0.00136	**-0.0128** **	**-0.0128** **
Remedies	**-0.00288*** **	**-0.0160*** **	-0.000379	-0.0108*	**0.00403*** **	**-0.0168*** **	**-0.0224*** **
Conformity	-0.000674	-0.00202	-0.00430	-0.0107*	-0.000589	**-0.0157*** **	-0.00951*
Consumer protection	**-0.00509*** **	0.00591	0.00690*	**0.0205*** **	-0.00124	**0.0207*** **	**0.0112** **
Refusal/ Higher prices	0.000335	0.00950	0.00216	0.00238	0.00151	**0.0147** **	0.00755
REASONS							
Price							
I find cheaper products online	**0.0143*** **	-0.0116	-0.00822	**-0.0611*** **	0.00430*	-0.0176	**-0.0636*** **
Quality and variety							
I find better quality products online	0.0117*	**0.0832*** **	**0.0383** **	**0.0789*** **	0.00254	0.0499*	**0.105*** **
I can find certain products only online	**0.0132*** **	0.0271*	**-0.0202** **	-0.0179	0.00147	0.0256*	0.0251*
There's more choice online	**0.01000*** **	0.0271*	-0.00387	-0.0260*	0.00116	-0.000328	0.0105
Transaction							
I save time by buying online	**0.00912*** **	**-0.0407*** **	0.00658	**-0.0446*** **	0.00331	**-0.0536*** **	-0.00595
I don't like going to shops	**0.0143*** **	0.0127	-0.0181	**0.0399** **	0.00518	0.0152	0.0356*
I can order at any time of the day/week	**0.00583** **	-0.00304	0.000674	**-0.0354*** **	0.00377	-0.0243*	-0.0255*
Products are delivered to a convenient place	**0.0209*** **	-0.00958	-0.00953	0.00331	0.00364	0.00630	0.00962
I can return products easily	0.0111**	0.00766	0.0242	0.0115	-0.00529	-0.00694	0.0117
Information							
It's easier to compare prices online	0.00527**	-0.0186	**0.0183** **	**-0.0357*** **	**0.00540** **	-0.0131	**-0.0218** *
It's easier to compare product information online	0.00379	0.0102	**0.0346*** **	-0.0235	0.000344	0.0257	**0.0349** **
I can find more information online	0.000845	-0.0128	-0.000891	-0.0161	0.00553	0.0227	**0.0315** **
I can find product reviews by other consumers	**0.00990*** **	0.0289*	0.00801	0.0159	**0.0113*** **	0.0172	**0.0440*** **
Other	**-0.0275*** **	**-0.143*** **	**-0.166*** **	-0.0616	-0.00584	-0.0371	**-0.167*** **
ICT USE AND SKILLS							
hoursinternet	**0.00125** **	**0.00717*** **	-0.00183	**0.00447** **	0.000230	**0.00524** **	**0.00928*** **
socialnetwork	-0.000138	**-0.0545*** **	0.00933	**-0.0809*** **	**0.0162*** **	-0.0256	**-0.0359** **
advanced	**0.0193*** **	**0.178*** **	**0.133*** **	**0.120*** **	**0.0238*** **	**0.174*** **	**0.235*** **
DEMOGRAPHICS							
age (in years)	**-0.000378*** **	**-0.00716*** **	**-0.00151*** **	**-0.00549*** **	**-0.000204** **	**-0.00753*** **	**-0.00644*** **
gender (1=female)	0.00212	**-0.0543*** **	2.46e-05	**-0.0472*** **	-0.00427*	**-0.122*** **	**-0.0768*** **
Education (Base: Elementary School)							
Some Secondary School	0.000638	-0.0177	**0.0770** **	-0.0759	0.00660	-0.0507	-0.000372
Graduation Secondary School	0.0120	0.0184	**0.140*** **	-0.0741*	0.00957	-0.0267	0.0180
Graduation College	**0.0189** **	0.0497	**0.195*** **	-0.0355	**0.0174*** **	-0.00909	0.0553
Post-graduate Degree	**0.0264*** **	0.0737*	**0.230*** **	0.0305	0.0142*	0.0466	**0.127*** **
Student	0.0154	0.0131	**0.154*** **	-0.0671	0.00823	-0.0151	-0.0567
Other	0.00538	0.0116	0.0823*	0.00566	**0.0170** **	-0.0501	0.00984
Refusal	-0.00824	0.0395	**0.122** **	0.0577	-0.00260	-0.0807	0.111*
Region (Base=Rural)							
Town, Urban centre	0.00349	**0.0424** **	**0.0815*** **	**0.0551*** **	0.00319	**0.0832*** **	**0.0657*** **
Metropolitan zone	**0.00594** **	0.00243	**0.0285** **	0.0157	**0.00573** **	0.0310*	0.00384
No. of languages spoken	0.00148	**0.0587*** **	**0.0456*** **	**0.0429*** **	**0.00732*** **	**0.0817*** **	0.00841
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,605	16,351	18,605	13,145	18,148	15,504	18,053

Notes: Standard errors in parentheses, Significance Level at *** p<0.01, ** p<0.05, * p<0.1. Estimated with a maximum-likelihood logit model. Marginal effects at mean population shown. Weights based on age, gender, and country applied.

Table 11: E-commerce matrix 2015 for tangible goods and online purchases of services (in million Euro)

	Country of Webshop																														
Country of Buyer	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NE	PL	PT	RO	SK	SI	ES	SE	UK	US	CN	Other
Austria	2655.4	10.4	0.3	20.3	4.2	25.4	11.5	0.7	1.7	66.7	1406.2	3.2	15.6	24.6	57.6	0.0	1.7	33.9	26.5	70.0	22.8	1.8	1.1	21.0	8.1	34.1	11.3	185.4	17.7	19.1	5.7
Belgium	7.2	3852.9	0.4	0.6	0.0	1.5	14.5	3.7	4.7	459.9	287.4	9.0	1.0	17.1	49.3	3.6	3.6	54.4	0.0	748.9	180.3	3.6	2.8	0.1	0.0	51.6	3.4	183.5	14.5	17.2	8.3
Bulgaria	3.2	0.6	499.8	0.6	0.8	1.4	0.4	0.2	0.3	7.8	32.9	5.8	2.1	0.6	8.0	0.9	0.3	0.2	0.4	2.4	2.2	0.9	16.5	0.1	0.5	5.0	0.6	58.3	20.5	38.1	11.1
Croatia	19.3	2.1	0.1	324.1	0.6	2.7	1.3	0.5	2.1	9.3	35.1	0.7	5.9	2.0	17.2	0.0	0.0	0.1	0.5	4.9	2.2	0.5	0.7	0.8	11.6	2.5	1.4	36.3	20.6	28.5	3.4
Cyprus	0.1	0.1	2.0	0.0	74.5	0.2	0.0	0.0	0.1	1.9	8.2	24.1	0.6	0.8	1.8	0.0	0.0	0.0	0.0	0.7	0.2	0.1	0.1	0.0	0.0	0.1	0.1	26.9	24.4	75.5	3.0
CzechRepublic	25.6	9.4	0.8	10.4	0.9	2495.6	0.9	1.4	5.3	23.4	95.6	3.0	2.2	3.2	12.1	0.5	1.1	3.8	4.8	8.9	28.5	2.5	2.0	44.0	1.7	11.0	2.2	72.1	9.0	16.5	3.8
Denmark	21.8	2.7	7.5	5.4	2.6	7.4	3792.6	0.0	5.8	34.4	240.3	23.6	9.7	4.4	30.8	0.0	5.1	2.6	1.4	37.5	10.2	9.7	0.6	2.2	0.3	47.3	95.8	259.2	57.5	23.8	7.4
Estonia	3.3	0.3	0.6	0.0	0.4	3.2	1.6	211.5	19.7	3.2	21.0	0.2	0.2	2.2	15.5	17.4	3.9	0.0	0.5	1.4	6.7	3.3	0.0	0.0	0.0	4.1	19.1	40.2	27.9	30.5	9.2
Finland	5.3	10.5	1.0	0.3	2.9	7.7	9.7	47.8	2279.4	25.8	154.8	2.3	0.8	6.0	7.5	4.0	0.1	2.6	4.8	15.1	3.9	0.1	3.2	2.9	0.2	32.7	116.5	186.6	21.9	15.0	7.0
France	147.8	1012.4	59.8	12.2	16.8	106.5	205.0	13.3	96.9	31443	1113.3	241.5	114.2	171.5	339.5	3.7	10.9	105.4	7.1	435.1	26.0	81.2	130.2	11.3	4.8	430.1	63.0	1443.5	47.8	14.1	8.9
Germany	981.8	77.7	42.9	57.0	42.7	62.3	97.9	2.4	15.5	705.7	49981	152.4	75.9	306.4	411.0	108.0	6.4	289.4	59.7	430.8	132.6	17.4	10.9	18.1	6.7	430.6	87.5	1561.4	15.8	10.6	10.5
Greece	7.9	6.6	10.4	0.4	16.0	1.5	2.2	0.0	1.6	27.1	77.3	1258.5	1.8	5.7	43.1	0.0	0.5	5.1	1.9	8.3	4.2	2.5	3.5	1.9	0.0	11.0	7.5	175.2	24.9	40.7	4.2
Hungary	18.1	0.6	3.4	3.2	0.0	3.0	0.4	0.5	0.5	6.4	37.3	0.5	1279.8	1.5	6.1	0.1	0.1	0.6	0.6	5.4	6.4	4.3	11.9	18.4	0.1	14.3	1.9	33.9	5.8	8.8	3.1
Ireland	5.7	2.4	2.3	6.7	0.1	8.6	8.8	0.0	0.7	51.4	103.6	12.2	4.9	1313.9	27.6	8.9	4.3	2.4	5.5	11.0	17.1	11.3	7.7	1.4	0.6	45.8	16.4	598.9	39.9	34.9	13.2
Italy	58.3	44.0	13.7	8.1	10.6	11.2	41.1	6.6	9.6	248.3	467.8	38.2	15.6	105.4	5927.6	11.1	11.6	81.3	0.6	39.9	18.9	26.5	37.7	10.5	14.1	212.9	12.4	465.6	21.7	17.6	4.1
Latvia	4.4	0.2	0.4	0.6	0.3	1.3	0.6	5.6	2.1	3.3	20.2	0.6	0.5	1.1	4.6	165.7	8.7	0.1	0.0	2.4	10.9	0.4	0.4	0.2	0.2	0.5	3.6	33.6	10.7	25.8	4.3
Lithuania	1.4	1.1	0.0	0.1	1.4	3.6	1.5	1.2	1.2	5.4	25.9	2.0	0.2	2.6	3.4	4.3	289.2	0.1	0.9	3.8	10.8	1.6	0.0	1.1	0.6	4.7	1.6	41.5	21.0	27.1	6.2
Luxembourg	16.9	50.6	0.0	0.0	0.0	0.4	2.8	0.0	0.1	84.6	199.2	2.2	0.0	0.2	11.3	0.0	0.0	289.2	0.0	11.7	0.8	9.9	0.0	1.2	0.2	7.0	3.9	41.3	84.8	9.9	14.3
Malta	0.5	3.3	1.4	0.0	0.2	0.3	0.0	0.0	0.0	8.2	21.2	0.2	0.3	8.9	20.3	0.0	0.2	0.0	112.5	0.6	0.1	0.1	0.0	0.0	0.0	2.6	1.4	77.5	54.0	63.1	16.0
Netherlands	68.1	259.2	5.9	6.8	0.3	12.6	89.2	83.1	1.9	138.9	423.8	24.7	1.1	9.2	105.2	3.0	152.2	22.2	1.0	9367.2	14.8	28.6	3.1	2.6	5.2	321.4	21.7	287.2	29.2	13.7	12.7
Poland	37.5	20.1	1.9	57.7	5.8	98.9	7.7	1.2	4.3	38.9	391.7	32.0	74.2	46.4	116.8	0.6	5.9	2.4	2.4	27.6	7644.5	12.1	5.3	46.3	2.6	90.5	23.7	298.0	9.9	13.8	1.5
Portugal	2.3	7.8	0.0	0.0	0.0	3.2	1.8	0.0	0.6	55.3	39.8	0.2	1.1	8.6	9.9	0.1	0.1	1.0	0.0	8.2	2.2	838.7	0.0	0.1	0.0	81.3	5.3	106.7	15.1	17.6	6.5
Romania	18.7	2.8	13.4	0.5	0.5	4.1	2.6	0.5	1.2	21.2	55.5	16.3	14.4	1.5	21.5	0.5	1.7	2.1	0.3	3.7	3.7	0.9	1256.3	0.5	1.5	14.3	3.6	54.2	15.0	11.8	1.1
Slovakia	45.4	6.4	2.6	6.5	2.4	157.3	0.2	0.0	0.2	5.6	47.7	5.0	19.5	1.2	12.1	0.6	0.3	1.5	0.5	4.7	25.2	0.1	1.7	1354.0	1.8	3.4	4.1	51.6	9.6	20.9	1.8
Slovenia	17.9	0.2	0.6	15.7	0.3	0.7	0.0	0.0	0.4	3.0	23.5	0.7	4.2	0.9	6.7	0.0	0.0	0.0	0.0	2.4	1.3	0.2	3.0	0.1	266.2	1.6	0.0	14.3	8.4	21.5	0.9
Spain	18.8	81.4	3.9	39.1	206.8	216.4	17.5	12.8	75.5	474.2	537.7	6.9	206.2	80.5	392.9	13.3	0.4	46.1	0.0	140.7	10.3	96.8	20.1	216.8	0.3	9316.3	6.3	708.3	21.3	28.1	1.9
Sweden	4.4	14.2	2.0	6.2	0.6	1.7	97.7	17.5	20.1	31.2	208.1	6.1	4.7	20.4	14.5	1.0	11.7	5.9	1.2	36.9	27.3	9.1	0.7	0.7	1.2	46.7	6011.3	371.4	27.2	18.4	15.1
UK	116.6	209.2	95.0	89.1	203.3	84.5	90.4	66.5	147.1	994.4	1748.0	208.9	235.1	531.1	288.6	25.6	61.7	210.3	51.1	270.2	232.6	317.1	59.1	26.7	9.7	703.4	227.7	51245	37.3	12.3	18.5

Notes: Inflated by population of country, which have ordered/bought goods or services for private use over the internet in the last twelve months (http://ec.europa.eu/eurostat/web/information-society/data/main-tables).

Table 12: E-commerce matrix 2015 for the last purchase (corrected country information), weighted averages in Euro

	Country of Webshop																														
Country of Buyer	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NE	PL	PT	RO	SK	SI	ES	SE	UK	NO	RU	US	CN
Austria	44.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.86	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	2.56	0.22
Belgium	0.00	65.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.63	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.52	0.29	0.00	0.00	0.00	0.00	1.81	0.00	3.64	0.00	0.00	10.14	0.75
Bulgaria	0.17	0.00	48.12	0.00	0.00	0.00	0.00	0.00	0.00	0.01	11.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.16	0.00	0.03	0.00	0.33	0.05	0.00	4.93	0.00	0.41	11.28	4.93
Croatia	0.00	0.00	0.00	33.35	0.00	0.00	0.00	0.00	0.00	0.00	2.85	0.00	2.78	0.00	0.36	0.00	0.00	0.00	0.00	3.34	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.83	0.00	0.13	26.61	0.57
Cyprus	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00	14.71	9.39	2.45	0.00	0.00	0.00	0.00	0.00	0.00	18.15	0.00	1.91	0.00	0.00	0.00	0.00	0.00	14.63	0.00	0.11	23.79	9.60
CzechRepublic	0.00	0.00	0.00	0.00	0.00	80.76	0.00	0.00	0.00	0.04	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.34	0.00	0.00	0.16	0.00	0.04	0.00	1.19	0.00	0.00	11.08	0.51
Denmark	0.00	0.05	0.00	0.00	0.00	0.13	60.40	0.00	0.11	0.00	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.13	0.05	0.00	0.00	0.00	0.00	0.00	2.08	6.71	0.00	0.00	27.79	0.42
Estonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.86	0.00	0.00	5.60	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	2.62	0.00	0.00	0.00	0.00	0.42	0.45	0.00	5.16	0.00	0.63	13.37	3.38
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	56.72	0.38	5.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	12.81	3.27	0.02	0.33	12.85	0.47
France	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.17	2.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.02	0.00	0.00	5.85	0.42
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	91.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	1.44	0.00
Greece	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	4.87	57.79	0.00	0.00	0.20	0.00	0.00	0.00	0.00	4.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.93	0.00	0.00	21.56	2.24
Hungary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.07	4.21	0.00	41.30	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.12	0.13	0.00	2.09	0.00	0.06	16.42	1.16
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	3.02	0.00	0.00	27.66	0.00	0.00	0.00	0.00	0.00	4.19	0.00	0.00	1.35	0.00	0.00	0.00	0.00	28.53	0.00	0.00	14.10	0.77
Italy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	5.15	0.00	0.00	0.00	70.05	0.00	0.00	0.00	0.00	5.80	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.06	0.00	0.00	5.65	0.14
Latvia	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.23	0.00	0.00	0.00	0.00	50.90	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.77	0.00	0.13	5.87	2.55
Lithuania	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.64	0.00	0.00	0.19	0.00	0.00	61.84	0.00	0.00	2.69	2.31	0.49	0.00	0.00	0.00	0.00	0.00	11.69	0.14	0.00	1.78	0.85
Luxembourg	0.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.81	60.96	0.00	0.00	0.00	0.00	0.00	0.00	6.56	0.00	13.39	0.00	0.00	0.00	0.00	0.00	1.19	0.00	0.32	0.00	0.00	8.76	0.00
Malta	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	20.45	0.00	0.00	0.51	0.98	0.00	0.00	0.00	7.51	1.50	0.00	0.00	0.00	0.00	0.00	0.83	0.00	45.31	0.00	0.00	33.29	0.75
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73	6.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.26	0.00	0.00	0.00	0.00	0.00	0.00	0.27	1.99	0.00	0.00	5.80	0.12
Poland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	6.04	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.80	61.02	0.00	0.00	0.09	0.00	0.26	0.17	0.43	0.00	0.09	0.80	2.84
Portugal	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	2.04	2.86	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	4.42	0.23	43.56	0.00	0.00	0.00	3.21	0.00	3.89	0.00	0.11	19.44	0.56
Romania	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	3.42	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	2.83	0.00	0.03	83.44	0.00	0.16	0.80	0.00	1.83	0.00	0.00	10.70	1.08
Slovakia	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	2.29	6.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.00	76.20	0.00	0.00	0.00	4.24	0.00	0.00	12.35	1.35
Slovenia	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	5.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	54.65	0.00	0.00	3.60	0.00	0.00	17.98	1.32
Spain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.81	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	0.00	75.16	0.00	1.27	0.00	0.00	17.34	1.05
Sweden	0.00	0.00	0.00	0.00	0.00	0.00	4.13	0.00	0.14	0.00	1.86	0.00	0.30	0.13	0.00	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	88.45	3.15	0.00	0.00	15.72	3.35
UK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.14	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.10	0.00	0.00	11.39	0.03

Notes: n=8816, based on website information of last purchase and country definition of websites according to Alaveras/Martens 2015

Table 13: Comparison of calculations for E-commerce expenditure in EU countries, 2014 and 2011

	Consumer Survey		Euromonitor		Difference	
	in mio. Euro				in %	
Country	2014 (2015)	2011	2014	2011	2014	2011
UK	58616	48967	64202	44945	-0.09	0.09
Germany	56209	59106	42027	23128	0.29	0.88
France	37917	32751	31996	22382	0.17	0.38
Spain	12998	12701	6862	5658	0.62	0.77
Netherlands	11516	10138	9383	6967	0.20	0.37
Poland	9122	7855	6115	3944	0.39	0.66
Italy	7993	45096	7974	4961	0.00	1.60
Sweden	7035	5866	6118	4009	0.14	0.38
Belgium	5985	3941	5083	2490	0.16	0.45
Austria	4764	3921	3735	2394	0.2	0.48
Denmark	4749	3990	5401	3560	-0.13	0.11
Finland	2979	2574	4182	3513	-0.34	-0.31
CzechRepublic	2902	1686	2327	1760	0.22	-0.04
Ireland	2368	775	3092	1869	-0.27	-0.83
Slovakia	1794	1105	781	538	0.79	0.69
Greece	1751	1999	1265	621	0.32	1.05
Romania	1546	667	601	536	0.88	0.22
Hungary	1478	1266	1074	636	0.32	0.66
Portugal	1213	1286	2093	1224	-0.53	0.05
Luxembourg	842	90	344	164	0.84	-0.58
Bulgaria	723	208	97	62	1.52	1.08
Croatia	537		94	91	1.40	
Lithuania	466	317	321	156	0.37	0.68
Estonia	447	142	262	185	0.52	-0.27
Slovenia	395	438	194	153	0.68	0.97
Malta	393	93	77	51	1.35	0.59
Latvia	313	577	179	123	0.55	1.30
Cyprus	245	188	124	67	0.66	0.95

Sources: GFK 2015, Civic consulting 2011 (Gomez et al., 2014) Eurostat and Euromonitor database (http://go.euromonitor.com/Passport-Home)

Table 14: Breakdown of E-commerce expenditure domestic and cross-border, 2011 and 2014

	Online Purchases of tangible goods and services					
	2014			2011		
Country	% domestic	% EU	% WW	% domestic	% EU	% WW
Luxembourg	37.2	57.1	5.7	26.3	68.6	5.1
Malta	39.2	51.5	9.3	6.8	62.2	31.0
Cyprus	44.8	40.9	14.3	15.7	51.2	33.1
Estonia	50.0	39.7	10.3	74.7	22.4	2.9
Ireland	53.1	38.8	8.2	57.6	34.4	8.0
Austria	54.0	42.1	3.9	63.1	34.0	2.8
Latvia	55.2	35.6	9.2	70.2	23.2	6.7
Netherlands	55.5	39.1	5.5	82.4	15.9	1.8
Croatia	59.2	29.3	11.4	na	na	na
Belgium	62.3	33.8	3.9	68.1	28.7	3.2
Lithuania	63.9	27.0	9.2	70.7	25.6	3.7
Portugal	65.5	26.2	8.3	66.2	27.8	6.0
Greece	67.0	22.5	10.5	70.6	24.4	5.0
Spain	67.4	26.2	6.4	74.0	22.3	3.7
Bulgaria	67.7	20.7	11.6	71.1	26.8	2.0
Slovenia	68.7	25.3	6.0	73.2	22.2	4.6
Italy	69.5	23.7	6.8	69.7	27.8	2.4
Slovakia	73.4	22.1	4.5	77.5	20.6	1.9
Finland	73.6	21.2	5.3	73.1	20.9	6.0
Denmark	75.1	17.2	7.7	77.9	19.1	3.0
France	77.3	15.7	6.9	85.3	12.4	2.3
Romania	79.8	16.6	3.5	83.8	15.2	1.0
Sweden	81.1	13.0	5.9	79.8	16.7	3.5
Poland	81.1	15.4	3.4	87.6	10.9	1.5
UK	82.6	11.8	5.6	85.0	12.1	2.9
CzechRepublic	83.0	12.6	4.4	88.9	9.8	1.2
Hungary	84.4	11.9	3.7	89.8	9.6	0.6
Germany	85.8	10.6	3.6	82.7	15.8	1.5

Table 15: Estimation results from the gravity equation, Goods vs. Content, 2015

	Total	Goods	Content
Distance (in log)	-0.598***	-0.598***	-0.0717**
	(0.0716)	(0.0716)	(0.0341)
Contiguity	0.433***	0.432***	0.172***
	(0.117)	(0.118)	(0.0546)
Common language	0.952***	0.966***	0.495***
	(0.217)	(0.216)	(0.128)
Home bias	3.806***	3.765***	3.366***
	(0.222)	(0.218)	(0.167)
Constant	5.525***	5.487***	0.660***
	(0.511)	(0.512)	(0.239)
Country of origin	Yes	Yes	Yes
Country of destination	Yes	Yes	Yes
Observations	784	784	784
R-squared	0.855	0.854	0.869

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 16: Comparing gravity estimations for goods in 2011 and 2015, and corrected information

	2011	2015 (yearly purchases)	2015 (last purchase & corrected country information)
Distance (in log)	-0.332***	-0.598***	0.149*
	(0.104)	(0.0716)	(0.0843)
Contiguity	0.651***	0.432***	0.293***
	(0.152)	(0.118)	(0.0965)
Common language	0.877***	0.966***	0.737***
	(0.194)	(0.216)	(0.210)
Home bias	4.432***	3.765***	3.154***
	(0.266)	(0.218)	(0.360)
Constant	3.424***	5.487***	-1.120*
	(0.723)	(0.512)	(0.580)
Country of origin	Yes	Yes	Yes
Country of destination	Yes	Yes	Yes
Observations	729	784	784
R-squared	0.855	0.854	0.616

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1,
2011 Data from Civic Consulting survey

Table 17: Summary Statistics from Clickstream Diary

VARIABLES	Obsverations	Total	Belgium	Poland
		%	%	%
Belgium	547	52.1		
Poland	503	47.9		
PURCHASES ACCORDING TO DIARY				
Goods Online	1,050	62	54.2	70.6
Goods Offline	1,050	66	59.9	72.5
Bought no goods	1,050	38	45.8	29.4
Services Online	1,050	29.9	26.6	33.8
Services Offline	1,050	10.7	7.5	14.4
Bought no services	1,050	64.7	69.2	59.5
Content Paid	1,050	27	23.5	31.2
Content Free	1,050	90.1	86.9	92.9
No Content	1,050	6.67	9.1	4.2
ICT USE AND SKILLS (from Core Survey)				
Avg. hours of internet per day				
0-2	1,050	37.6	47.3	26.9
3-5	1,050	45.4	42.5	48.2
6+	1,050	17.3	10.2	24.9
Active in Social Networks	1,050	81.8	79.9	83.2
*No. of languages spoken**	1,050	1.905	2.004	1.797
Advanced Use of Internet	1,050	38.3	33.6	43.1
DEMOGRAPHICS				
Age				
18-34	1,050	47	30.1	65.4
35-54	1,050	37.8	46.5	28.5
55+	1,050	15.1	23.4	6.1
female	1,050	53.9	51.6	56.5
Education				
Elemantary school	1,050	1.62	2.6	0.6
Some Secondary School	1,050	6.19	9.7	2.4
Graduation Secondary School	1,050	28.8	32.1	25.1
Graduation College	1,050	25.7	36.9	13.8
Post-graduate Degree	1,050	25	13.7	37.4
Student	1,050	7.05	2.9	11.5
Other	1,050	4.76	1.5	8.3
Refusal	1,050	0.857	0.7	1
Region				
Metropolitan zone	1,050	32.2	21.5	43.7
Town, Urban centre	1,050	32	26.8	37.5
Rural	1,050	35.8	51.6	18.8

*unweighted percentages, * in numbers not percent*

Table 18: Cross-tabulations of average time spent and number of websites visited with Diary Survey Information

VARIABLES	Avg.Minutes p day	Avg. Minutes	Avg. No. of Websites
Total	144.1	2638.7	167.2
Belgium	124.9	2205.7	151.4
Poland	163.9	3090.2	183.0
PURCHASES ACCORDING TO DIARY			
Goods Online	151.0	2750.7	175.0
Goods Offline	144.5	2636.0	162.4
Bought no goods	131.5	2431.6	152.8
Services Online	148.1	2659.8	177.1
Services Offline	145.6	2743.5	168.9
Bought no services	141.9	2612.7	162.4
Content Paid	164.1	2995.0	180.3
Content Free	145.8	2675.4	167.4
No Content	122.0	2260.3	171.7
ICT USE AND SKILLS (from Core Survey)			
Avg. hours of internet per day			
0-2	109.8	1895.1	137.0
3-5	149.6	2778.4	173.9
6+	202.4	3859.9	212.4
Active in Social Networks	146.5	2689.9	170.3
Advanced Use of Internet	152.8	2825.1	179.6
DEMOGRAPHICS			
Age			
18-34	155.1	2790.3	182.6
35-54	127.3	2334.3	151.1
55+	148.6	2866.6	155.3
female	140.8	2584.6	164.8
Education			
Elemantary school	136.1	2776.3	182.6
Some Secondary School	144.3	2713.0	180.4
Graduation Secondary School	137.2	2609.7	163.4
Graduation College	128.8	2260.4	155.1
Post-graduate Degree	151.2	2689.9	164.6
Student	185.2	3433.6	207.8
Other	165.1	3137.4	170.8
Refusal	130.4	2282.2	179.8
Region			
Metropolitan zone	154.0	2821.7	175.0
Town, Urban centre	147.8	2768.2	183.2
Rural	130.4	2332.5	144.1

*unweighted percentages, * in numbers not percent*

Table 19: Cross-tabulations of time spent online on websites from home country, another EU country or outside EU and Diary Survey Data

by sample group	Home	another EU	outside EU
	%	%	%
Total	55.87	11.33	32.79
Belgium	40.81	21.60	37.59
Poland	67.40	3.47	29.13
PURCHASES ACCORDING TO DIARY			
Goods Online	58.04	10.23	31.73
Goods Offline	56.94	10.64	32.42
Bought no goods	51.61	13.54	34.85
Services Online	58.66	9.32	32.02
Services Offline	58.17	8.11	33.72
Bought no services	54.23	12.60	33.17
Content Paid	58.33	9.90	31.76
Content Free	55.92	11.40	32.68
No Content	53.45	11.47	35.08
ICT USE AND SKILLS (from Core Survey)			
Avg. hours of internet per day			
0-2	57.03	11.23	31.73
3-5	54.00	12.59	33.40
6+	57.85	9.25	32.90
Active in Social Networks	54.79	10.66	34.55
Advanced Use of Internet	57.85	8.73	33.42
DEMOGRAPHICS			
Age			
18-34	59.37	7.17	33.47
35-54	52.97	13.56	33.46
55+	50.65	19.76	29.59
female	55.56	9.24	35.20
Education			
Elemantary school	42.94	18.04	39.02
Some Secondary School	39.88	18.94	41.18
Graduation Secondary School	54.98	11.42	33.60
Graduation College	50.97	15.01	34.02
Post-graduate Degree	65.52	7.83	26.65
Student	57.12	3.66	39.21
Other	55.57	14.76	29.67
Refusal	45.29	15.43	39.27
Region			
Metropolitan zone	59.54	7.89	32.57
Town, Urban centre	57.97	9.73	32.29
Rural	49.37	16.97	33.66

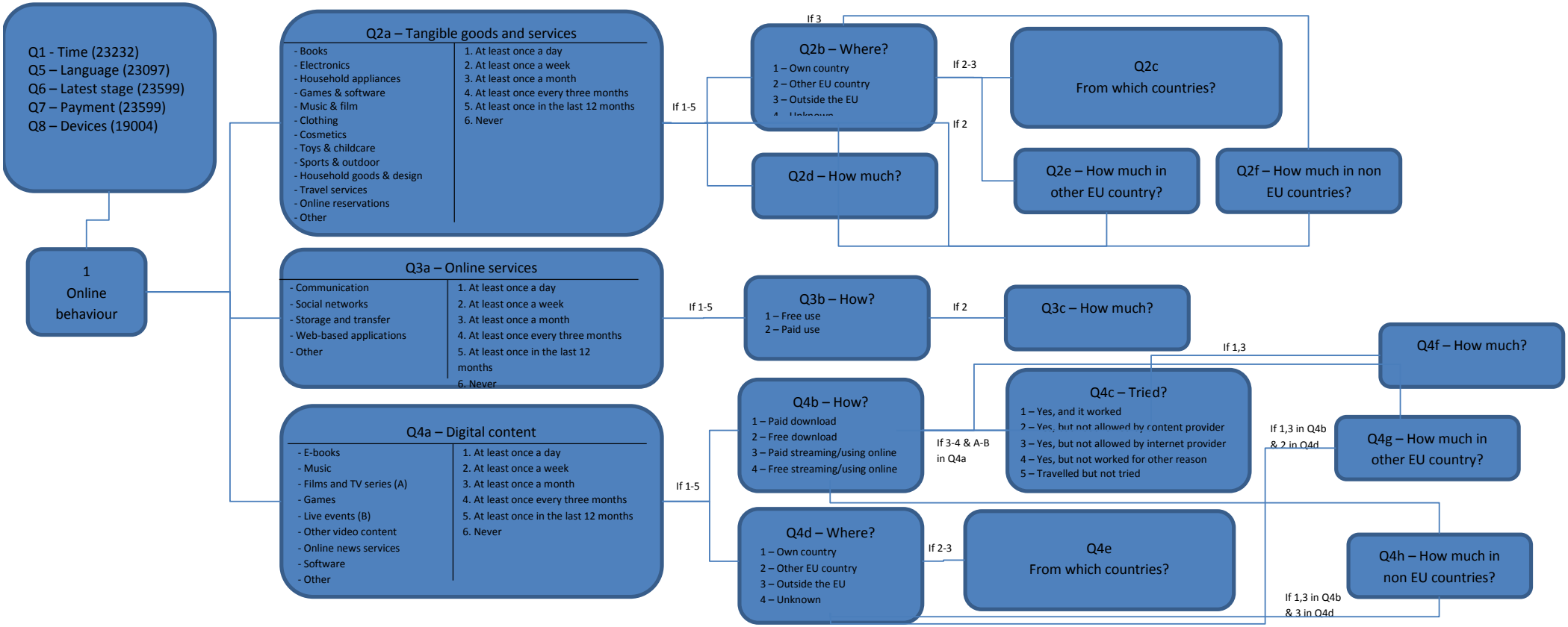
unweighted percentages

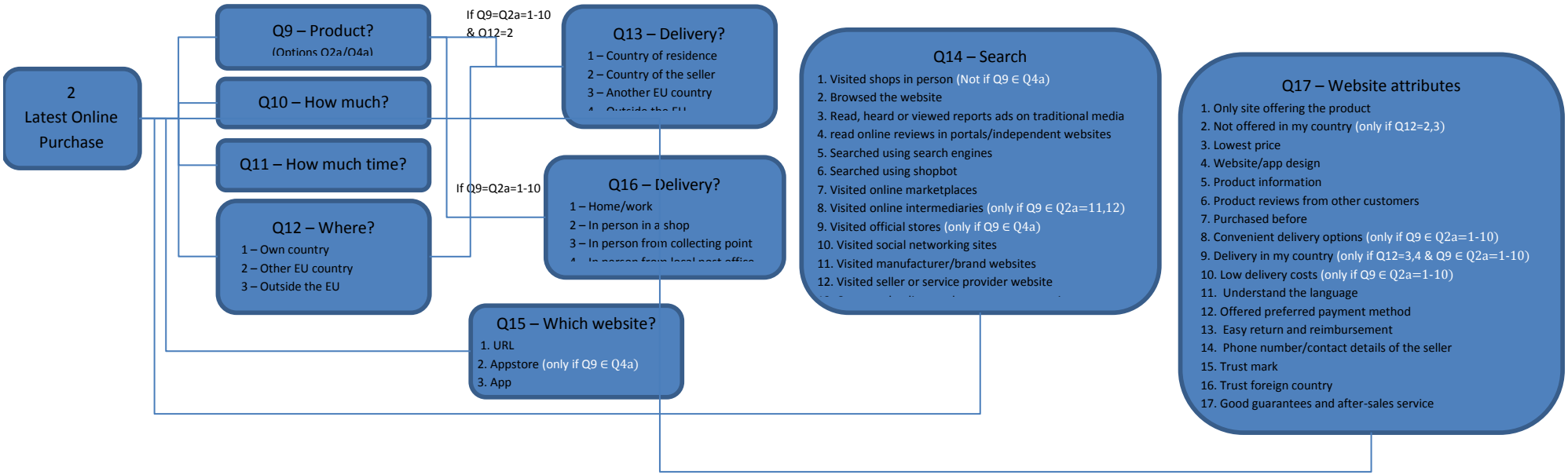
Table 20: E-commerce Euro spent vs. web surfing in other countries

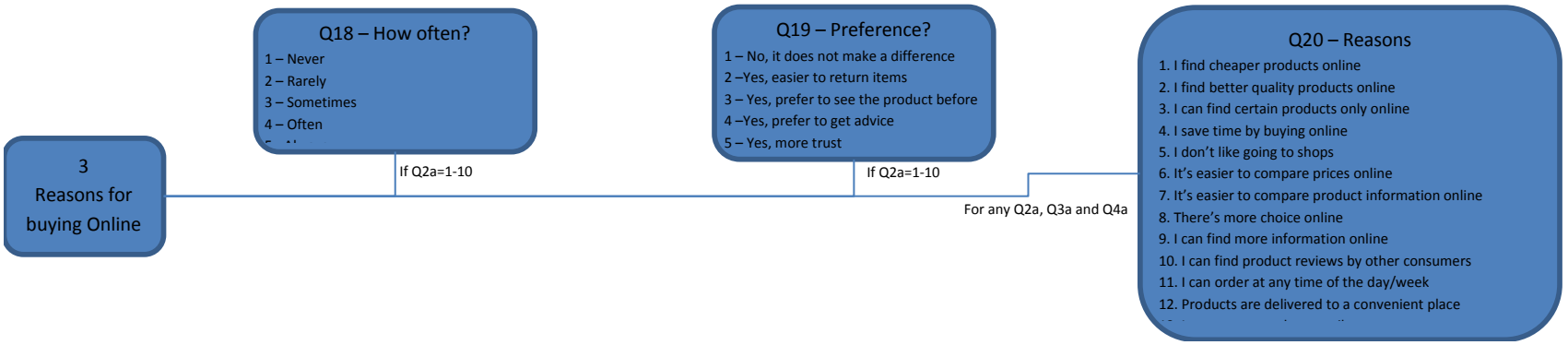
	Average E-commerce expenditure				Recorded avg. minutes clickstream			
	Belgium		Poland		Belgium		Poland	
	in €	in %	in €	in %	Minutes	in %	Minutes	in %
Austria	1.1	0.1	2.9	0.4	0.2	0.1	0.3	0.1
Belgium	626.2	62.1	1.6	0.2	82.4	40.2	0.1	0.0
Bulgaria	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Croatia	0.1	0.0	4.3	0.6	0.0	0.0	0.0	0.0
Cyprus	0.0	0.0	0.4	0.1	0.1	0.1	0.1	0.1
CzechRepublic	0.2	0.0	6.9	1.0	0.2	0.1	0.5	0.2
Denmark	2.6	0.3	0.6	0.1	0.4	0.2	0.3	0.1
Estonia	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.0
Finland	0.8	0.1	0.3	0.0	0.1	0.0	0.1	0.0
France	74.2	7.4	3.1	0.4	28.4	13.8	1.7	0.7
Germany	46.9	4.7	29.5	4.1	4.6	2.2	4.3	1.7
Greece	1.4	0.1	2.6	0.4	0.1	0.0	0.1	0.0
Hungary	0.2	0.0	6.0	0.8	0.0	0.0	0.2	0.1
Ireland	3.0	0.3	3.6	0.5	0.6	0.3	0.2	0.1
Italy	7.7	0.8	9.4	1.3	0.6	0.3	0.6	0.2
Latvia	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Lithuania	0.5	0.1	0.5	0.1	0.0	0.0	0.0	0.0
Luxembourg	9.4	0.9	0.2	0.0	0.1	0.1	0.0	0.0
Malta	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0
Netherlands	124.4	12.3	2.4	0.3	23.0	11.2	1.7	0.6
Poland	29.1	2.9	574.7	80.6	0.3	0.2	184.9	72.1
Portugal	0.6	0.1	1.0	0.1	0.1	0.1	0.0	0.0
Romania	0.5	0.0	0.4	0.1	0.4	0.2	0.1	0.0
Slovakia	0.0	0.0	3.3	0.5	0.1	0.0	0.2	0.1
Slovenia	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Spain	8.5	0.8	7.2	1.0	0.7	0.4	0.4	0.2
Sweden	0.5	0.1	1.8	0.3	0.7	0.3	0.5	0.2
UK	30.6	3.0	23.4	3.3	0.4	0.2	0.5	0.2
US	14.2	1.4	10.1	1.4	41.9	20.4	39.3	15.3
China	17.6	1.7	14.1	2.0	0.8	0.4	0.7	0.3
Russia				0.0	1.1	0.5	1.1	0.4
Other	7.5	0.7	1.5	0.2	17.7	8.6	18.0	7.0

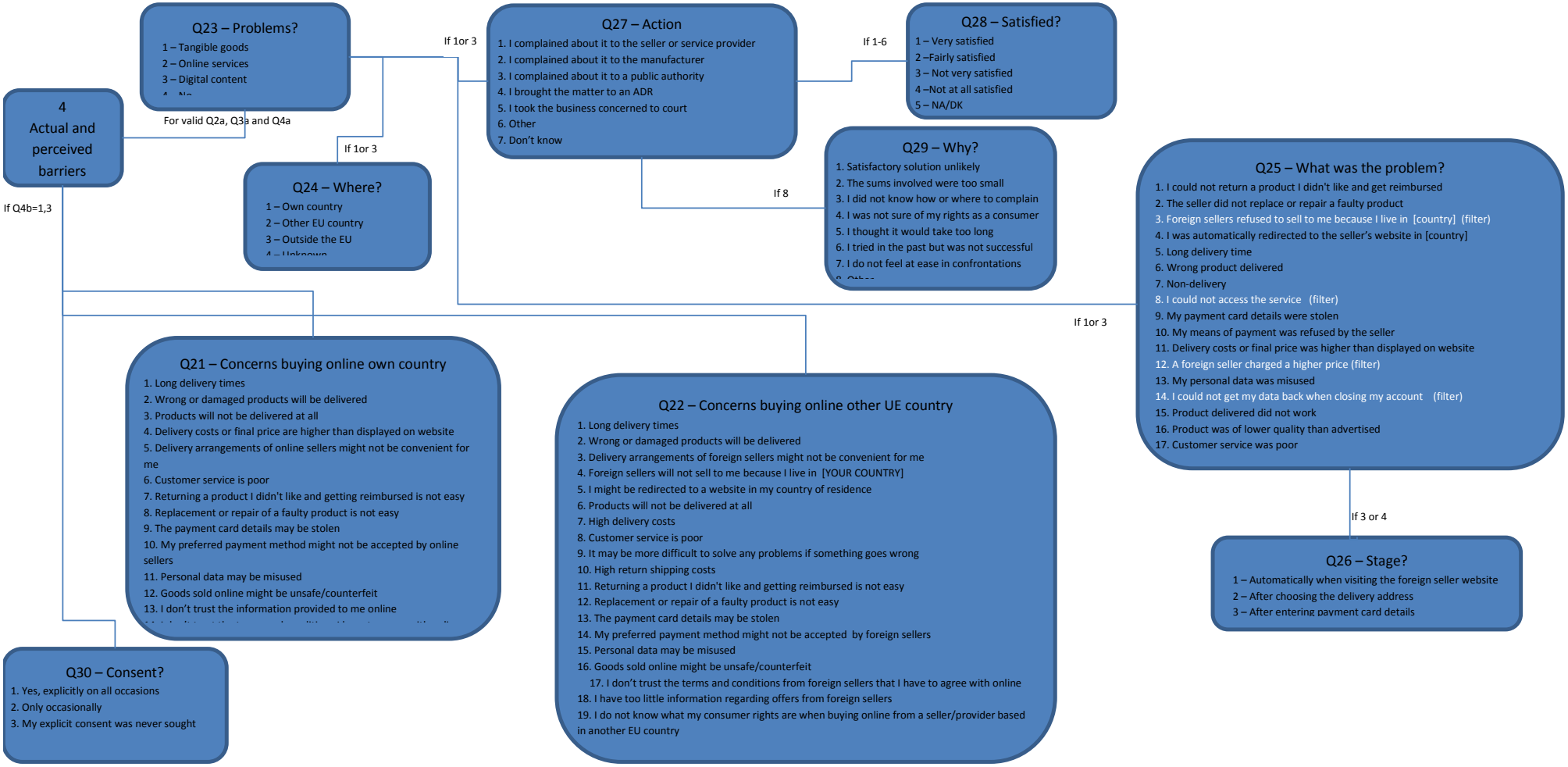
ANNEX III

Figure 1: Consumer questionnaire flow chart




2
Latest Online Purchase
Q9 – Product?
(Options Q2a/Q4a)
Q10 – How much?
Q11 – How much time?
Q12 – Where?
1 – Own country
2 – Other EU country
3 – Outside the EU
If Q9=Q2a=1-10 & Q12=2
If Q9=Q2a=1-10
Q13 – Delivery?
1 – Country of residence
2 – Country of the seller
3 – Another EU country
Q16 – Delivery?
1 – Home/work
2 – In person in a shop
3 – In person from collecting point
Q15 – Which website?
1. URL
2. Appstore (only if Q9 ∈ Q4a)
3. App
Q14 – Search
1. Visited shops in person (Not if Q9 ∈ Q4a)
2. Browsed the website
3. Read, heard or viewed reports ads on traditional media
4. read online reviews in portals/independent websites
5. Searched using search engines
6. Searched using shopbot
7. Visited online marketplaces
8. Visited online intermediaries (only if Q9 ∈ Q2a=11,12)
9. Visited official stores (only if Q9 ∈ Q4a)
10. Visited social networking sites
11. Visited manufacturer/brand websites
12. Visited seller or service provider website
Q17 – Website attributes
1. Only site offering the product
2. Not offered in my country (only if Q12=2,3)
3. Lowest price
4. Website/app design
5. Product information
6. Product reviews from other customers
7. Purchased before
8. Convenient delivery options (only if Q9 ∈ Q2a=1-10)
9. Delivery in my country (only if Q12=3,4 & Q9 ∈ Q2a=1-10)
10. Low delivery costs (only if Q9 ∈ Q2a=1-10)
11. Understand the language
12. Offered preferred payment method
13. Easy return and reimbursement
14. Phone number/contact details of the seller
15. Trust mark
16. Trust foreign country
17. Good guarantees and after-sales service


3
Reasons for buying Online
Q18 – How often?
1 – Never
2 – Rarely
3 – Sometimes
4 – Often
If Q2a=1-10
Q19 – Preference?
1 – No, it does not make a difference
2 –Yes, easier to return items
3 – Yes, prefer to see the product before
4 –Yes, prefer to get advice
5 – Yes, more trust
If Q2a=1-10
For any Q2a, Q3a and Q4a
Q20 – Reasons
1. I find cheaper products online
2. I find better quality products online
3. I can find certain products only online
4. I save time by buying online
5. I don't like going to shops
6. It's easier to compare prices online
7. It's easier to compare product information online
8. There's more choice online
9. I can find more information online
10. I can find product reviews by other consumers
11. I can order at any time of the day/week
12. Products are delivered to a convenient place


4
Actual and perceived barriers
If Q4b=1,3
Q23 – Problems?
1 – Tangible goods
2 – Online services
3 – Digital content
For valid Q2a, Q3a and Q4a
If 1or 3
Q24 – Where?
1 – Own country
2 – Other EU country
3 – Outside the EU
If 1or 3
Q27 – Action
1. I complained about it to the seller or service provider
2. I complained about it to the manufacturer
3. I complained about it to a public authority
4. I brought the matter to an ADR
5. I took the business concerned to court
6. Other
7. Don't know
If 1-6
Q28 – Satisfied?
1 – Very satisfied
2 –Fairly satisfied
3 – Not very satisfied
4 –Not at all satisfied
5 – NA/DK
If 8
Q29 – Why?
1. Satisfactory solution unlikely
2. The sums involved were too small
3. I did not know how or where to complain
4. I was not sure of my rights as a consumer
5. I thought it would take too long
6. I tried in the past but was not successful
7. I do not feel at ease in confrontations
If 1or 3
Q25 – What was the problem?
1. I could not return a product I didn't like and get reimbursed
2. The seller did not replace or repair a faulty product
3. Foreign sellers refused to sell to me because I live in [country] (filter)
4. I was automatically redirected to the seller's website in [country]
5. Long delivery time
6. Wrong product delivered
7. Non-delivery
8. I could not access the service (filter)
9. My payment card details were stolen
10. My means of payment was refused by the seller
11. Delivery costs or final price was higher than displayed on website
12. A foreign seller charged a higher price (filter)
13. My personal data was misused
14. I could not get my data back when closing my account (filter)
15. Product delivered did not work
16. Product was of lower quality than advertised
17. Customer service was poor
If 3 or 4
Q26 – Stage?
1 – Automatically when visiting the foreign seller website
2 – After choosing the delivery address
3 – After entering payment card details
Q21 – Concerns buying online own country
1. Long delivery times
2. Wrong or damaged products will be delivered
3. Products will not be delivered at all
4. Delivery costs or final price are higher than displayed on website
5. Delivery arrangements of online sellers might not be convenient for me
6. Customer service is poor
7. Returning a product I didn't like and getting reimbursed is not easy
8. Replacement or repair of a faulty product is not easy
9. The payment card details may be stolen
10. My preferred payment method might not be accepted by online sellers
11. Personal data may be misused
12. Goods sold online might be unsafe/counterfeit
13. I don't trust the information provided to me online
Q22 – Concerns buying online other UE country
1. Long delivery times
2. Wrong or damaged products will be delivered
3. Delivery arrangements of foreign sellers might not be convenient for me
4. Foreign sellers will not sell to me because I live in [YOUR COUNTRY]
5. I might be redirected to a website in my country of residence
6. Products will not be delivered at all
7. High delivery costs
8. Customer service is poor
9. It may be more difficult to solve any problems if something goes wrong
10. High return shipping costs
11. Returning a product I didn't like and getting reimbursed is not easy
12. Replacement or repair of a faulty product is not easy
13. The payment card details may be stolen
14. My preferred payment method might not be accepted by foreign sellers
15. Personal data may be misused
16. Goods sold online might be unsafe/counterfeit
17. I don't trust the terms and conditions from foreign sellers that I have to agree with online
18. I have too little information regarding offers from foreign sellers
19. I do not know what my consumer rights are when buying online from a seller/provider based in another EU country
Q30 – Consent?
1. Yes, explicitly on all occasions
2. Only occasionally
3. My explicit consent was never sought

European Commission
Joint Research Centre – Institute for Prospective Technological Studies

Title: Consumer Perceptions of (Cross-border) eCommerce in the EU Digital Single Market

Authors: Melisande Cardona, Néstor Duch-Brown and Bertin Martens

Spain: European Commission, Joint Research Centre

2015 – 42 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9408 (online)

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