Internet and Consumer behaviour in Travel and Tourism: A European Cross-National Analysis

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Abstract: The emergence of the internet and the development of ICTs have transformed communications and the marketing of products and services. This paper examines the extent to which the internet has penetrated homes in the various EU countries and how online consumers behave in activities linked to travel and tourism. The years 2007 and 2016 were analysed in order to make a comparison over time of the progression of the internet and ICTs among EU citizens and to examine similarities and differences in behaviour patterns in the field of tourism. This study helps confirm a correlation between digitalisation and ICTs in buying habits for tourism products and services, finding that though digital divides between countries are narrowing over time, this is not the case in the use of ICTs in tourism in particular. Our findings indicate divergent behaviour patterns and trends in online travel and accommodation management and in the way that ICTs are used in the European Union.

Keywords: Internet, ICTs, eTourism, consumer behaviour, EU, digital tourism.

INTRODUCTION

Tourism as an information-intensive industry can gain major synergies from the use of the internet (Garín-Muñoz & Perez-Amaral, 2011). The tourism industry has undergone a great transformation since information and communications technologies (ICTs) emerged in the 1980s, and especially since the advent of the internet in the late 1990s (Buhalis & Law, 2008). The tourism industry has become the sector that sells most products and services via the internet (Abou-Shouk, Lim & Megicks, 2013). Buhalis & Law (2008) identified the internet as one of the most influential technologies in the changes in travellers' behaviour in the first decade of the 21st Century. A large body of research is available today regarding ICTs and tourism (Law, Leung & Buhalis, 2009; Law, Buhalis & Cobanoglu, 2014; Pesonen, 2013; Ukpabi & Karjaluoto, 2017), given the emergence of new devices (i.e. smartphones, tablets) and social networks. So far few studies have investigated tourists' digital profile and internet adoption in comparative cross-national terms. According to the UNWTO[1] (2017), the highest numbers of international arrivals worldwide correspond to five of the 28 countries making up the EU (Spain, UK, Germany, France and Italy). Setting out from the study by Buhalis & Law (2008) that identified the internet as a tool conducive to consumer behaviour change in the

tourism industry, we analyse the situation in 2007 (1st decade of the 21st century) and in 2016 (2nd decade of the 21st century) to consider trends over a 10-year period.

We are ultimately interested in ascertaining whether internet penetration is conducive to the online take-up of tourism products by end users, to which end we established two indicators in order to get sufficient data to answer our research questions and to consider their trends over the analysis period.

Thus our study's contribution is twofold: firstly, we review eTourism and the figure of the eTourist in the academic literature; secondly, we show trends over time allowing us to apprehend different behaviours across European countries, finding that though the digital divide between countries is narrowing over time, this is not the case in the use of ICTs in tourism in particular.

Our study consists of four sections. After the introduction, Section 2 reviews the literature on the topic. Section 3 describes indicators allowing us to ascertain the degree of integration of ICTs in EU countries when used for travel and tourist accommodation, and discusses the results of our empirical analysis. Finally Section 4 contains our conclusions and their implications for tourism strategy, along with their limitations, as well as future avenues of research.

LITERATURE REVIEW AND HYPOTHESES

We identified four research areas among the technological developments that have benefited eTourism and its consumers:

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1. Tools

Linked to the technologies used, tools and devices used in tourism such as: the internet (Cardoso & Lange, 2007; Fodor & Werthner, 2005); mobile phones (Liburd, 2005; Kim, Chung, Lee & Preis, 2015; Kim, Park & Morrison, 2008); social networks (Harrigan, Evers, Miles & Dalis, 2017, Chung & Koo, 2015); information functionality (Kaplanidou & Vogt, 2006); design (Law, Qi & Buhalis, 2010); browsability (Herrero & San Martín, 2012) or informativeness (Lai, 2015).

2. Information

Regarding information procured and exchanged, including its accuracy, relevance, quality and reliability (Filieri & McLeay, 2014), with there being increasing demand for impartial travel information from other consumers (D'Ambra & Wilson, 2004) in trip planning. Viewing and obtaining information as needed for building and designing a travel experience (Chung & Koo, 2015; Filieri & McLeay, 2014); this also includes price queries and comparisons (Amaro & Duarte, 2015).

3. Interaction

With reference to interaction and flow between the tool or app and the user, involving aspects of complexity (Amaro & Duarte, 2015), novelty (Chen, Shang & Li, 2014), enjoyment (Chung & Koo, 2015) and safety as the main concern (Kim, Ma & Kim, 2006; Escobar-Rodríguez & Carvajal-Trujillo, 2014). This includes the management of the selected tourism services such as hotel bookings, plane tickets and buying trips on the internet or with mobile devices (Amaro & Duarte, 2015; Kim, Lee & Chung, 2013; Escobar-Rodríguez & Carvajal-Trujillo, 2013, Wang, Li, Li & Zhang, 2016, Suki & Suki, 2017). Also other activities associated with situations after arrival, e.g. finding restaurants or other specific services (Bai, 2015).

4. Consumer Profile

Researching consumer profiles, attitudes and intentions (Agag & El-Masry, 2016) and their behaviour (Amaro & Duarte, 2015). This also includes technology acceptance (Ukpabi & Karjaluoto, 2017), and perceived internet self-efficacy and capacity for technology leadership (Srivastava & Dhar, 2016). An emerging aspect is technology use in post-travel situations such as proactive recommendations to others (Kim, Qu & Kim, 2009; Morrison, Jing, O'Leary & Cai, 2001) or

blogs (Chen, Shang & Li, 2014; Ho & Lee, 2015). Some research examines tourists' emotional responses and post-consumption assessments as to satisfaction and intention to recommend (Hosany & Prayag, 2013; Garín-Muñoz & Moral, 2017). There are also eTourism studies investigating the role of personal eTourist factors such as gender (Kim, Lee & Chung, 2013) or sexual orientation (e.g. homophilia in Ayeh, Au & Law, 2013), age (Morrison, Jing, O'Leary & Cai, 2001; Pesonen, Komppula & Riihinen, 2015) or previous experience (Jacobsen & Munar, 2012), as well as consumer patterns (Bonn, Furr & Susskind, 1998; Luo, Feng & Cai, 2005).

There are few pan-European studies to be found (Szopiński & Staniewski, 2016) on internet penetration and consumer behaviour in tourism. There are analyses by country, such as Albania (Tolica, Gorica, Panajoti & Pjero, 2017), Greece (Andreopoulou, Lemonakis, Koliouska & Zopounidis, 2017) or Spain (Infante-Moro, Infante-Moro & Martínez-López, 2016; Garín-Muñoz & Perez-Amaral, 2011) or specific experiences in Italy (Garau, 2015). We have studies from other parts of the world such as Australia (Mistilis, Buhalis & Gretzel, 2014) or China (Guo, Liu & Chai, 2014). Studies by country are common outside Europe and focus mainly on the boost given to tourism and thus to economic growth in the country in question – often developing countries such as India (Kumar, Chauhan & Srivastava, 2017), Thailand (Sangpikul, 2017) or Rwanda (Safari & Spencer, 2016).

METHODOLOGY AND DATA

With the aim of ascertaining whether internet penetration is conducive to the online take-up of tourism products by end users, we propose two indices for showing the correlation between internet use among the inhabitants of EU countries, and internet use in activities linked to travel and accommodation.

We devised these indices using the survey conducted annually by Eurostat in EU countries since 2002 called "European Union Survey on ICT usage in households and by individuals". Thus we obtained information on EU inhabitants using the internet and on ICT usage in eCommerce. For 2007 the sample involved 243,044 questionnaires, and for 2016, 203,978. As the EU population is just over 511 million (Eurostat, 2017), the Eurostat sample provides a confidence level of over 95% and a margin of error of less than 5%. Thus eTourists are considered to be those who seek information and buy services online, in

keeping with the definition used by Eurostat in its survey.

For the years studied, in Figures **1** and **2** we show the distribution of individuals using the internet for travel and accommodation services, and of individuals using the internet in the last 12 months, to illustrate the sample distribution.

As a method of comparison we used the Revealed Comparative Advantage (RCA) concept proposed by Balassa (1965, 1977) for studying country specialisation in international trade (i.e. exports). RCA gives an indication of whether a country is specialised as regards the product exported relative to the rest of

the world. We adapted the index to analyse specialisation in eCommerce in tourism and in internet use in EU countries, as other authors have done on using this index in the study of various sectors (Dieter & Englert, 2007; Wang, Li, Li & Zhang, 2016; Tacchella *et al.* 2012). Various authors have applied the index in studies of tourism in particular (Wattanakuljarus & Coxhead, 2008; Algieri, Aquino & Succurro, 2016). Finally we compared the indices obtained, allowing us to see the correlation between specialisation eCommerce in tourism and in internet use.

With our first index – Tourism ICT Integration Index (IITur) – we obtain the degree of integration in internet usage for tourism purposes. This allows us to
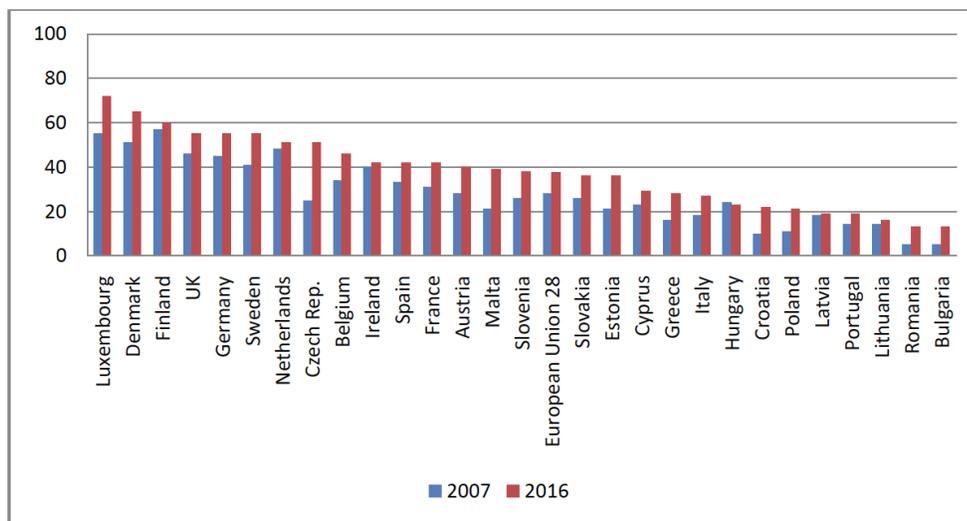
Figure 1: Percentage of individuals using the internet for travel and accommodation services.

Source: Own research using "European Union Survey on ICT usage in households and by individuals".
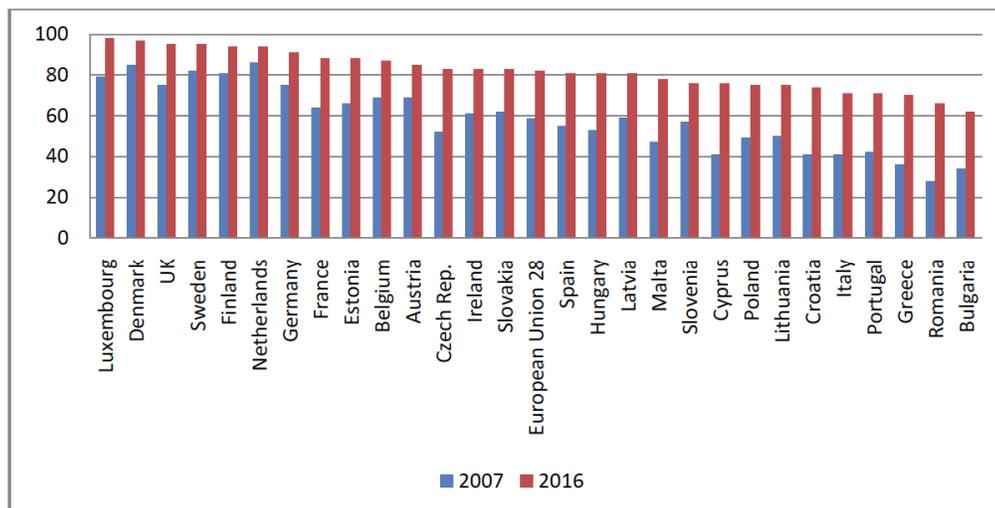
Figure 2: Percentage of individuals using the internet in the last 12 months.

Source: own research using "European Union Survey on ICT usage in households and by individuals".

determine whether the usage by country analysed is higher or lower than the average for the usage of these services in relation to the country's population, with the following formula:

$$IITur = \frac{(Xtp / Xtue)}{(Xpp / Xpue)} \qquad (1)$$

The result is obtained with four items:

IITtur: Index of ICT Integration in tourism in the EU.

Xtp: Internet use for travel and accommodation by inhabitants of the country in the year analysed (Eurostat-Community survey on ICT).

Xtue: Internet use for travel and accommodation by inhabitants of the EU in the year analysed (Eurostat-Community survey on ICT).

Xpp: Population of the country in the year analysed (Eurostat-Population).

Xpue: Population of EU countries analysed in the relevant year (Eurostat-Population).

We define a second indicator – ICT Integration Indicator (IITtic) – obtained by analysing internet usage in the country analysed relative to usage in the rest of Europe, together with the country's population and the EU population, using data from the Eurostat sample.

$$IITic = \frac{(Xip / Xiue)}{(Xpp / Xpue)} \qquad (2)$$

Here the result is also obtained with four items:

IITtic: Index of internet usage integration in the EU.

Xip: Internet usage of the country's population in the year analysed (Eurostat-Community survey on ICT).

Xiue: internet usage of the population of the EU in the year analysed (Eurostat-Community survey on ICT).

Xpp: Country's population in the year analysed (Eurostat-Population).

Xpue: Population of EU countries analysed in the relevant year (Eurostat-Population).

With this index we obtain the degree of ICT usage across all sectors in the country analysed, enabling us to ascertain if a country's usage is higher than average in relation to the country's population.

In either of the proposed indices, a value greater than one unit indicates a rate higher than the rate for EU countries overall. Thus the country will have a degree of specialisation higher than the European average. A value of less than one unit will indicate a degree of specialisation lower than the European average.

We calculated the indices for 2007 and 2016 because the former is the first year for which consolidated data are available for analysis and the latter is the latest year for which data were available for this study.

EMPIRICAL ANALYSIS AND RESULTS

The values obtained with the proposed indices for 2007 and 2016 were as set out in Table **1**.

Graphs **1** and **2** show the behaviour of the results obtained. The values for the two indices in 2007 and in 2016 can be clearly correlated. Thus if we estimate a regression line we obtain a high R^2 value, allowing us to assert that there is a strong correlation between variables where the coefficient linking them is higher, indicating that an improvement in the ICT index has a greater impact on the resulting tourism index.

The results obtained for variance and standard deviation in the indices were as follows:

We see that both variance and standard deviation decreased in 2016 as compared to 2007, allowing us to assert that countries are behaving in a more uniform way. Yet they still have high values in IITtic variance and standard deviation, as shown in Graphs **1** and **2**. The scatter for the IITur index remains very high, whereas the scatter for IITtic fell considerably from 2007 to 2016.

For 2007 we see that nearly all countries have similar values in the IITur and IITtic indices. There is a very strong correlation between general internet usage and its usage for items linked to travel and tourism. The countries where this rule does not hold may be classified as those with high IITtur values, of more than one unit, and with IITtic values of less than one unit. Such is the case of Spain, whose population has below-average internet usage but is strongly inclined to use the internet for items linked travel and tourism. At the other end we find countries with a high IITtic value and a low IITtur value, such as Lithuania, Estonia and Slovakia. Such countries make great use of ICTs, but this is not reflected in above-average usage for items

Table 1:   IITtic and IITur Index Results for 2007 and 2016

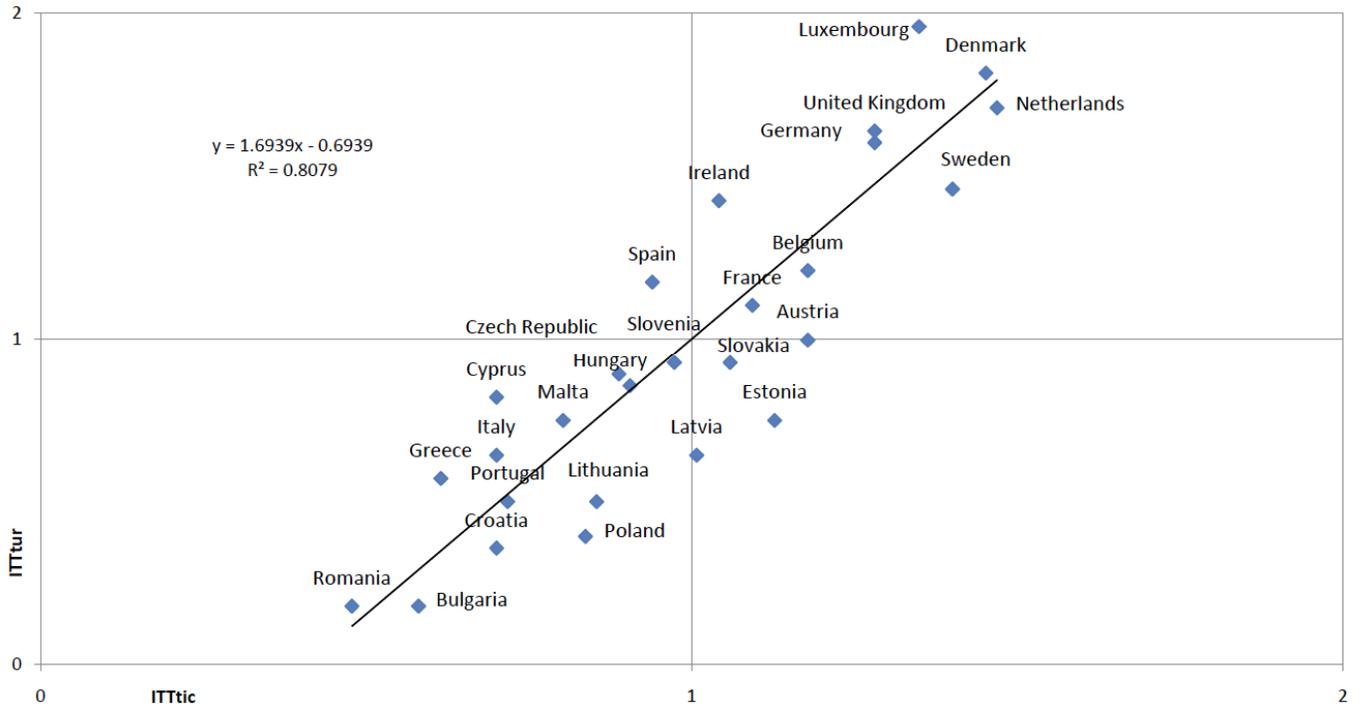| Country	IITtic 2007	IITtic 2016	Country	IITur 2007	IITur 2016
Austria	1.178767541	1.0356832	Austria	0.997455471	1.06161137
Belgium	1.178767541	1.06005222	Belgium	1.211195929	1.22085308
Bulgaria	0.580841977	0.75543951	Bulgaria	0.178117048	0.3450237
Croatia	0.70042709	0.90165361	Croatia	0.356234097	0.58388626
Cyprus	0.70042709	0.92602263	Cyprus	0.819338422	0.76966825
Czech Rep.	0.888346553	1.01131419	Czech Rep.	0.890585242	1.3535545
Denmark	1.452104942	1.1818973	Denmark	1.816793893	1.72511848
Estonia	1.127516779	1.07223673	Estonia	0.748091603	0.95545024
Finland	1.383770592	1.14534378	Finland	2.030534351	1.59241706
France	1.093349603	1.07223673	France	1.1043257	1.11469194
Germany	1.281269067	1.10879025	Germany	1.603053435	1.45971564
Greece	0.615009152	0.85291558	Greece	0.569974555	0.74312796
Hungary	0.90543014	0.98694517	Hungary	0.854961832	0.61042654
Ireland	1.042098841	1.01131419	Ireland	1.424936387	1.11469194
Italy	0.70042709	0.86510009	Italy	0.641221374	0.71658768
Latvia	1.007931666	0.98694517	Latvia	0.641221374	0.5042654
Lithuania	0.854179378	0.91383812	Lithuania	0.498727735	0.42464455
Luxembourg	1.349603417	1.19408181	Luxembourg	1.959287532	1.91090047
Malta	0.802928615	0.95039164	Malta	0.748091603	1.03507109
Netherlands	1.46918853	1.14534378	Netherlands	1.709923664	1.3535545
Poland	0.83709579	0.91383812	Poland	0.391857506	0.55734597
Portugal	0.717510677	0.86510009	Portugal	0.498727735	0.5042654
Romania	0.478340451	0.80417755	Romania	0.178117048	0.3450237
Slovakia	1.059182428	1.01131419	Slovakia	0.926208651	0.95545024
Slovenia	0.973764491	0.92602263	Slovenia	0.926208651	1.00853081
Spain	0.939597315	0.98694517	Spain	1.175572519	1.11469194
Sweden	1.400854179	1.15752829	Sweden	1.460559796	1.45971564
UK	1.281269067	1.15752829	UK	1.638676845	1.45971564

Source: Our research using Eurostat.

Table 2:   Regression Line Results for 2007 and 2016

2007	2016
$y = 1.6939x - 0.6939$ $R^2 = 0.8079$	$y = 3,2512x - 2.2512$ $R^2 = 0.7993$

Table 3:   Variance and Standard Deviation Results for IITur and IITtic in 2007 and 2016

IITtur	2007	2016	IITtic	2007	2016
Variance	0.284725415	0.18846537	Variance	0.080171605	0.01425159
Standard deviation	0.523981536	0.42630325	Standard deviation	0.278043762	0.11722885

Graph 1: Comparison for indicators IITur and IITtic 2007.
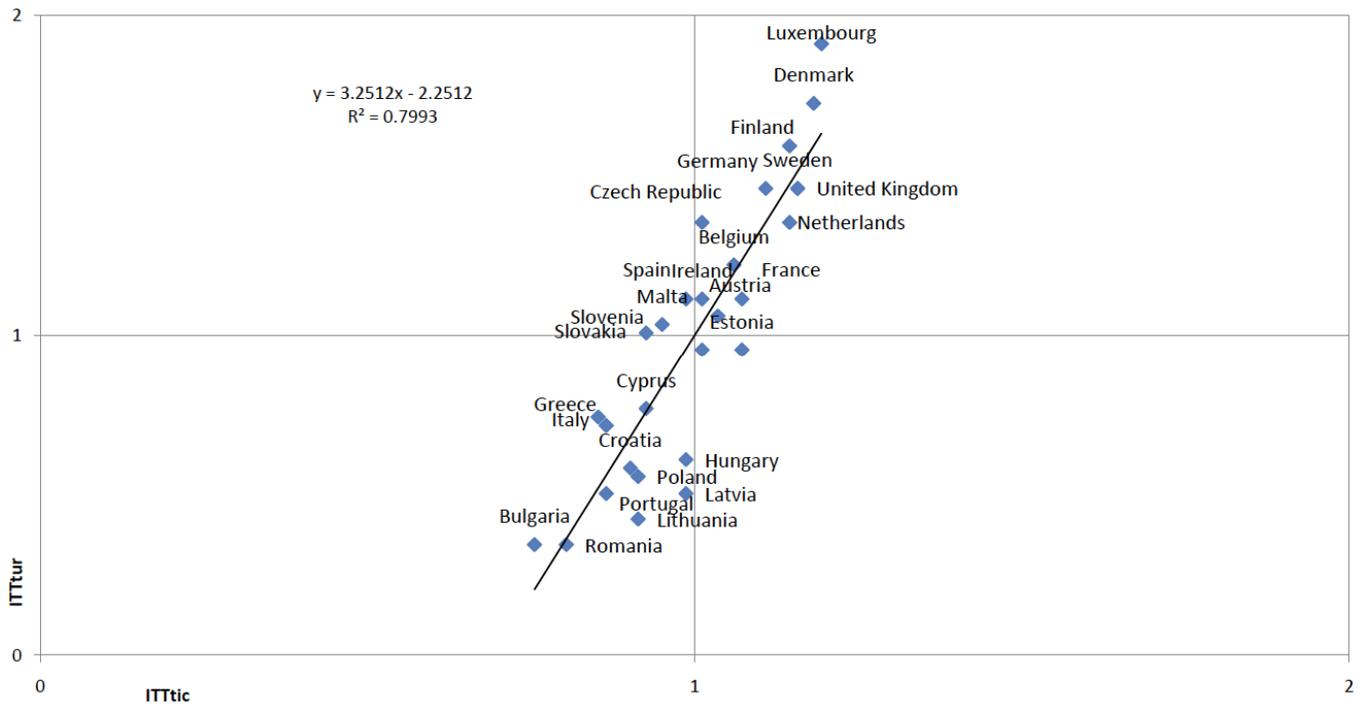
Graph 2: Comparison for indicators IITur and IITtic in 2016.

linked to travel and tourism. A possible explanation of these particular results might be the propensity of the country's population to travel: this hypothesis could be a subject for future research.

Regarding behaviour in 2016, we find a less scattered IITtic index. Bulgaria has the lowest IITtic, at 0.755, and Luxembourg the highest, at 1.194. In 2007 Rumania was the lowest, at 0.478, and Holland the highest, at 1.469. In the IITtic index the gaps have narrowed between the countries considered over the last ten years. But this is not so with the IITtur index, which shows similar scatter measurements over the

last 10 years. If we look at this aspect in the graph for 2007, we find just two countries where IITtic is above one unit and IITtur below it (Slovakia and Estonia), whereas by contrast as countries with IITtur above one unit and IITtic below it, we find Spain, Malta and Slovenia. And in the two cases analysed we find very similar values. For IITtur we obtain variance of 0.188, whereas variance for IITtic is just 0.014.

CONCLUSIONS AND DISCUSSION

On analysing the online behaviour of European citizens in the field of tourism and its trends over recent years, we find a clear increase in ICT competencies resulting in a convergence at European level over the 10-years study period (2007-2016). Yet this positive trend has not applied to ICT habits in tourism. Geographical differences have decreased in ICT adoption but not as regards travel and accommodation, where the scatter between countries is high despite the passage of time. Though these findings allow us to answer our research questions: We cannot assert that internet penetration is conducive to the online take-up of tourism products by end users.

In addition to a real characterisation of ICT behaviour and usage and eTourists in theoretical terms, our study's main contributions are: firstly, confirming the correlation between digitalisation and ICTs in tourism, which we have quantified after observing the trends over the study period. Secondly, we have verified the digital convergence between countries and the lack of equivalence in digital tourism, in which the scatter between countries has persisted. Thirdly, we have quantified this scatter and identified the countries that behave best and worst over time, with practical implications for tourism firms and policies. According to Warschauser (2004), what is most important about ICTs is not so much the availability of a computing device or an internet line as people's ability to make use of that device and line to engage in meaningful social practices.

This study has limitations especially in that it is conditioned by the use of aggregate data, making it hard to analyse our findings in greater detail. And given the particular design of Eurostat surveys as regards the dataset in question, central and west European countries are overrepresented given the availability of data, constituting a second limitation of our study. In any event, the real observations described here provide new data about the reality of European tourism in the digital age.

Future lines of research overcoming those limitations would be to take account of socio-demographic and/or cultural variables in the various EU countries, conducting the same study but with a longer study period, or developing it so as to estimate or predict the likelihood of purchase in various countries. The analysis of available information should also be extended to other sources or by means of in-depth interviews with tourism industry managers and end users. Finally it would interesting to study any correlation between the information circulated by the tourism industry and users' perception and opinion of it.

In any event, as there are few studies of this type, with a multicountry outlook and a view over time, this paper adds to the academic literature on this subject so significant to the EU economy. The spread of ICTs in tourism may create favourable social and economic conditions from which many citizens and organizations in both developed and developing countries may benefit (Minghetti & Buhalis, 2010). It is desirable for policymakers to promote such a spread of ICTs so as to pave the way for convergence in digital tourism across European countries.

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