



# Dynamics of digital tourism's consumers in the EU

Luis Manuel Ruiz-Gómez<sup>1</sup> · Julio Navío-Marco<sup>1</sup> ·  
Luisa Fernanda Rodríguez-Hevía<sup>2</sup>

Received: 8 May 2018 / Revised: 5 October 2018 / Accepted: 2 November 2018  
© Springer-Verlag GmbH Germany, part of Springer Nature 2018

## Abstract

This article examines the effects of the new e-citizens' digital skills in their behaviour as e-tourists. It analyses how European digital citizens behave in digital tourism, and whether there are any geographical differences. We have observed that the most influential factor for these e-Tourism activities is having made purchases via the Internet in the past 12 months. Differences have been detected between the more developed and less developed areas of Europe, which could indicate a digital divide. Therefore, the results indicate divergent behaviour patterns in digital travel and accommodation, as well as divergent trends in different EU geographical areas.

**Keywords** Internet · ICT · eTourism · Consumer behaviour · EU · Digital tourism

## 1 Introduction

Digitalisation and use of the Internet are changing the structure of the tourism industry, altering the entry barriers, facilitating price transparency and competition, revolutionising the distribution channels, optimising cost and improving production efficiency (Kim et al. 2004; Buhalis and O'Connor 2005; Buhalis and Law 2008). In fact, the tourism industry has become the biggest category for products and services sold via the Internet (Abou-Shouk et al. 2013).

---

✉ Luis Manuel Ruiz-Gómez  
lmruiz@cee.uned.es

Julio Navío-Marco  
jnavio@cee.uned.es

Luisa Fernanda Rodríguez-Hevía  
lfrhevia@uax.es

<sup>1</sup> Department of Management and Business Organization, UNED, Paseo Senda del Rey N11, 28040 Madrid, Spain

<sup>2</sup> Department of Business Economy, Alfonso X El Sabio University, Villanueva de la Cañada, Spain

It is becoming increasingly frequent for digital citizens to query and obtain the information they require and to prepare their travelling experiences via the Internet or electronic devices (Chung and Koo 2015; Filieri and McLeay 2014). Apart from obtaining this information, they also manage the selected e-tourism services, such as booking hotels, air tickets and purchasing their trips via the Internet or mobile devices (Amaro and Duarte 2015; Kim et al. 2013; Navío-Marco et al. 2018; Wang et al. 2016; Suki and Suki 2017). This analysis will focus on these search, purchase and management of tourism activities to obtain a better understanding of the tourism product demand and purchase phase.

Our study is of special interest from the search for trip information to completion of the purchasing process, because knowing the customers and their habits is a vital success factor when deploying ICTs in tourism. According to Warschauser (2004), what is most important about ICT is not so much the availability of computing devices or the Internet line, but rather people's ability to use such devices to engage in meaningful social practices.

Early findings from different academic studies indicated that Internet users shared one single sociodemographic profile: In the 90s, an internet user was probably under 45 and had a University Degree (Weber and Roehl 1999). More recently, Sigala (2004) indicates that the sex, age, education level, career, economic profile, ethnic group and certain Internet skills are common to all users. However, this author also points out that the impact of social factors on e-commerce is under researched not only in the general literature but also in the context of e-travel and e-tourism in particular (Sigala 2004).

Users' gradual immersion in the digital world and their maturity and aging in this environment could have modified their standard profile and behaviour, making it advisable to conduct further research into the question. In fact, the senior group constitutes the "engine of growth" in tourism (Schröder and Widmann 2007; Chen and Shoemaker 2014), and very little research has been done into this group's more specific digital behaviour (Niehaves and Plattfaut 2014).

Furthermore, hardly any research draws the attention to the geographical aspect of the sociodemographic profile of the European digital tourists. When compared to studies in other environments such as Australia (Mistilis et al. 2014) or China (Guo et al. 2014), it is clear that there are very few studies on a pan-European level (Szopiński and Staniewski 2016).

This study provides answers to the following research questions: what is the profile of the tourist in Europe where digital technology use is concerned? Are there any differences in the European environment? We need to know not only who these digital customers are, but also to understand what impact their characteristics have on the e-tourism business.

The findings obtained show not only the importance of having purchased other goods and services (not associated with tourism) via the Internet in the past 12 months, but also the major role of senior tourists in the different regions. In this sense, our contribution is mainly twofold: firstly, we develop e-tourism literature, increasing an understanding of the e-tourist, through an empirical comparative analysis at European level; secondly, we provide insights into the driving

forces behind e-tourists' behaviour, highlighting the influence of previous purchases via the Internet (unrelated to tourism) and the role of the senior segment.

## 2 Literature review: e-tourist digital capacities

An increasing amount of literature has analysed the impact of ICTs on the tourism ecosystem, as can be seen from the extensive bibliographical reviews (Frew 2000; Leung and Law 2007; Buhalis and Law 2008; Law et al. 2009, 2014; Pesonen 2013; Ukpabi and Karjaluoto 2017). Four main research areas can also be established from the numerous research works studying the different ways of linking ITC technologies and tourism from a user perspective. These areas also involve a direct link between digital devices and tourists, and are as follows: (1) the technological tools and devices utilised in tourism, (2) the information retrieved and exchanged, (3) the interaction and flow between the tool or application and the user, (4) the customers' profiles. Table 1 details some relevant researches, by way of example, for the different areas.

Focusing on the fourth fundamental line, centred specifically on the customer, a wide theoretical corpus has been used to address the behavioural determinants associated with the adoption and use of the Internet and ICTs in general.

The literature presents well-grounded theories about customer behaviour, namely the Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975), the Theory of Planned Behaviour (TPB) (Ajzen 1991), the Innovations Diffusion Theory (IDT) (Rogers 1995) or the Technology Acceptance Model (TAM) (Davis 1989). These theories have received substantial empirical support in explaining users' acceptance in several domains, notably information systems, and, specifically, online shopping (Amaro and Duarte 2013, for a literature review). The Technology Acceptance Model (TAM), which mainly originates from the information systems field, has been subject to subsequent theory development (Venkatesh and Davis 2000), especially the Unified Theory of Acceptance and Use of Technology (UTAUT) and Model of Adoption of Technology in Households (MATH).

Specifically with tourism in mind, Fleischer and Felsenstein (2004) pointed out that research analysing travel on the Internet uses two different approaches, one of which focuses on changes regarding suppliers, i.e., traditional agents, new services, and new brokers and platforms. The other approach concentrates on the social and economic profiles of Internet users, and their attitude towards on-line tourism services. As far as e-tourism is concerned, the background to on-line purchases could be classified into three main categories: characteristics of the consumer, characteristics of the perceived channel and characteristics of the website and the product (Amaro and Duarte 2013).

Sociodemographic characteristics influence the behaviour associated with the purchase of on-line tourism services. The actual purchase of a product is determined by age, education, income and profession (Morrison et al. 2001). There are also cases of e-tourism research into the role of personal factors affecting the e-tourist such as age (e.g., older travellers that use ICTs, in Pesonen et al. 2015) sex (Kim et al. 2013) or sexual orientation factors (for example, homophilia in Ayeh et al.

**Table 1** Relationship between the technology and the tourist

Area	Topic	Examples in the literature	Main finding
Technological tools and devices	Type of technology	Internet (Cardoso and Lange 2007; Fodor and Werthner 2005), mobile phones (Liburd 2005; Kim et al. 2015), social networks (Harrigan et al. 2017, Chung and Koo 2015), Internet of things (Kaur and Kaur 2016), NFC (Kim and Kim 2017), satellite (Vijay et al. 2016), virtual and augmented reality (Kounavis et al. 2012) wearables (Jhajharia et al. 2014), robots (Murphy et al. 2017)	Several investigations analyse the specifics of the interaction between the customers and the technology under study
	Functionalities	Kaplanidou and Vogt (2006)	The results showed that motivating visuals and trip information functionality were significant predictors of tourism Web site usefulness. Web site usefulness was a significant predictor of intent to travel to the destination
	Design	Law et al. (2010)	The authors highlight the importance of website design and that a number of website development evaluation instruments have appeared in the tourism field
Information retrieved and exchanged	Navigability	Herrero and San Martín (2012)	Information on the accommodation and destination positively influences the perceived usefulness of the webs, whereas both the interactivity and navigability have a positive effect on the perceived ease of use of the websites
	Informativity	Lai (2015)	Two factors influencing use of mobile App for tourism are informativeness and entertainment
	Accuracy/reliability	Filieri and McLeay (2014), Chung and Koo (2015)	Information accuracy, information value-added, information relevance, are strong predictors of travelers' adoption of information from online reviews on accommodations

**Table 1** (continued)

Area	Topic	Examples in the literature	Main finding
The interaction and flow with the user	Complexity	Amaro and Duarte (2015)	Individuals' perceived complexity of online travel shopping is negatively related to attitude towards online travel shopping
	Novelty Enjoyment	Chen et al. (2014) Chung and Koo (2015)	Novelty in a blog affects behavioural intention to visit The users of new social media, especially for travel information searches, are influenced by both benefits (information reliability, enjoyment) and sacrifices (complexity, perceived effort)
Customer	Safety	Kim et al. (2006), Escobar-Rodriguez and Carvajal-Trujillo (2014)	Consumers of low-cost airlines who purchase tickets online are influenced mostly by their trust and habits in using such websites. Safety as factor influencing Chinese online reservations intentions
	Profile, attitudes and intentions	Agag and El-Masry (2016)	Consumers' intentions to book hotel online are determined by commitment, trust, attitude, and their antecedents. Finally, commitment, trust and attitude have higher influence on intention to book hotel online for low-habit customers
	Behaviour	Amaro, and Duarte (2015)	Perceived behavioural control positively influences intentions to purchase travel online, echoing the postulation of the Theory of Planned Behaviour
	Involvement with the technology	Ukpabi and Karjaluoto (2017)	Consumers' emotional involvement, attitude, innovativeness and flow are important personal characteristics for the purchase of travel online
Perception of self-efficacy	Srivastava and Dhar (2016)	Results indicated a positive influence of Internet self-efficacy on job performance when travel agent employees offer their customers better information through blogs and posts on the Internet and use the Internet as the source of information	

(2013). The studies of gender influence, when analysing internet purchasing behaviours (Cabezudo et al. 2004; Drèze and Hussherr 2003; Margarida 2013) and Tourism 2.0 (Hernández-Méndez and Muñoz-Leiva 2015) report mixed results.

Li and Buhalis (2006) revealed that (1) age was a factor where on-line purchase intention was concerned, and (2) individuals between 31 and 40 years old were more likely to purchase in this context. New studies have been published about the specific nature of the new generations of tourists: Silent Generation, Baby Boomers, Generation X, and Generation Y (Li et al. 2013). Bilgihan et al. (2013) and Parsa and Cobanoglu (2011) highlight the pivotal role of affective commitment for developing and maintaining long-term relationships in tourism with Generation Y. Research into the behaviour and impact of the millennials is also on the increase (Ramsay et al. 2017). Although tourists' online behaviour has been increasingly studied where the younger part of the population is concerned (Nusair et al. 2012), less work has been done in the elderly tourist segment. The senior collective deserves more attention, because it is a growing and lucrative category of tourists (Mahadevan 2014; Chen and Shoemaker 2014).

Heung (2003) observed that travellers mainly from Western Countries with higher levels of education and higher annual household incomes are more likely to use the Internet to purchase travel services (Heung 2003). They are also more likely to have had prior travelling experience, which also makes them more receptive to the on-line booking of travel purchases (Gursoy and Chen 2000).

Finally, it is observed that the absence of connectivity (bandwidth restrictions) is a factor that limits the use of e-commerce, and, thus, e-tourism (Buhalis and Jun 2011; Turban et al. 2008). Broad bandwidth and, in general, proper connectivity is critical for allowing the transmission of digital information at high bandwidths on existing phone lines for supporting the users (Buhalis and Licata 2002).

In summary, as has already been pointed out, many studies have been conducted with a view to understanding the profile, attitude and behaviour of e-tourists, but only a few associate these activities with extensive geographical areas. Such research could yield important general information that is not limited to one particular country or city, allowing us to establish comparisons. We have also observed that the senior tourist market has received little attention from tourism literature and that different generations of e-tourists behave in different ways.

### 3 Methodology and data

As the data sample, we have used the information obtained from the questionnaire: "European Union survey on ICT usage in households and by individuals 2015" (Eurostat Model Questionnaire Version 3.1.). This survey is conducted on a yearly basis in European Union countries. Information is thus obtained from the EU inhabitants who use the Internet about how they use e-commerce. As the aim is to study the characteristics of the users that have purchased goods and services associated with tourism via the Internet (holiday accommodation and other services for travelling) in the last 12 months, the study target has been selected from individuals who

have used the Internet in the past 12 months, which in this case amounts to 150,035 persons.

A binary logistic regression model was devised to establish the profile of consumers who book accommodation and travel via the Internet. This model was chosen because it enables the user to explain or predict the characteristic of a dichotomous event on the basis of a series of variables that are considered to have a bearing (López-Roldan and Fachelli 2015).

One of the objectives is to compare to see whether this profile changes on the basis of the geographical location where the respondents live. In this sense, the logistic regression model is applied in three types of zones. We use the NUTS classification created by the EU that reflects the territorial administrative division of the Member States.<sup>1</sup> The NUTS classification is the most used for studies since they are the basic regions for the planning of regional and cohesion policies of the European Union, as they are observed in different studies (Fischer and Stumpner 2008; Von Lyncker and Thoennesen 2017; Overman and Puga 2002). The use of regional data (NUTS) instead of national data is recommended as national studies can hide regional disparities (Overman and Puga 2002). Eurostat database provides also a GDP level per region (GEO\_DEV), for the logistic regression:

- Area 1: Less Developed Region. Where the GDP per inhabitant is less than 75% of the average for the EU-27.
- Area 2: Region in Transition. Where the GDP per inhabitant ranges from 75 to 90% of the average for the EU-27.
- Area 3: More Developed Region. Where the GDP per inhabitant is higher than 90% of the average for the EU-27.

A binary logistic regression model has been estimated to analyse the purchase of holiday accommodation and travel via the Internet and the determining factors that have an effect on each one of the groups on the basis of their economic development, in order to establish the differences between the influencing variable when it comes to making the decision to purchase these goods and services associated with tourism. The aim when conducting this analysis was to have a minimum target of 10,000 respondents for each one of the models. As the sample sizes for our target range greatly from one region to another, the sampling fractions were applied for each zone that is shown in Table 2. A simple random sample was carried out for each one of the groups, to make sure that the significance of the variables was not due to the sample size.

The dependent variable is dichotomy, taking the value 1 when the respondent has made on-line purchases of goods and services associated with tourism in the past 12 months, and taking the value 0 if not.

The variables explaining the choice of digital purchase are grouped into sociodemographic aspects, the type of connection that they use to access the Internet, the use that is made of the Internet, the digital skills they possess, the origins of the

---

<sup>1</sup> See <http://ec.europa.eu/eurostat/web/regions>.

**Table 2** Number of cases in each development region

Zone	Number of cases	Fraction of sample applied* (%)
Less developed regions	10,933	20
Regions in transition	10,164	70
More developed regions	12,020	15
Total	33,117	

Source: own research and from the “European Union survey on ICT usage in households and by individuals 2015”

\*Simple random sample

seller and the frequency of purchase. To make this easier to understand, a description of the variables is given in Table 3 below.

Statistical software SPSS Version 24 was utilised to devise the binomial logistic regression model with the aforementioned data for each one of the zones distinguished on the basis of economic development.

To begin with a logical regression was carried out involving the entire study target, in which apart from the aforementioned variables, the development variable for the region was also included for explanatory purposes. It could be deduced from the results of the regression that this variable is statistically significant for each one of the categories analysed, and that if we take the Less Developed Regions as the reference category, any movement towards More Developed Regions indicates a greater likelihood of being a digital consumer of tourist products (2.48 times for Regions in Transition and nearly three times more likely for the More Developed Regions. Table 4 shows the marginal findings of the regression for the regional development variable.

## 4 Findings and discussion

### 4.1 Findings for the estimation in the Less Developed Regions

A simple random sample of 10,933 respondents was selected for the regions with a low level of economic development, and these were subjected to logistic regression. The findings can be seen in Table 5. A square R of 23% was obtained from Cox and Snell, a square R of 43.8% was obtained from Nagelkerke, as well as a value for p of 0.805 in the Hosmer and Lemeshow Test. The regression was classified correctly at 88.5% for the general cases, and the classification for the digital purchasers of tourist services and goods was correct at 27.8%, being 97.0% for non-purchasers (the cut-off point is 0.5). In view of all the above, it can be guaranteed that the logistic regression is well adjusted. The coefficients (B) are positive for all the significant variables, so an increase in each one of them, when compared to the reference category, is tantamount to an increase in the likelihood of purchasing tourism products on the Internet.



**Table 3** Independent variables and modalities

Variable	Reference category	Rest of categories
<b>Sociodemographic</b>		
Population density	Sparse	Intermediate Dense
Age	From 16 to 24 years	From 25 to 34 years From 35 to 44 years From 45 to 55 years From 55 to 64 years 65 years or over
Education level	Primary education	Secondary education Higher education
Sex	Male	Female
Employment	Unemployed	Employed or self-employed Inactive
<b>Connection to the Internet</b>		
Fixed broadband at home	No	Yes
Mobile broadband at home	No	Yes
Mobile network outside home and work via mobile network	No	Yes
Wi-Fi outside home or work	No	Yes
<b>Use of the Internet</b>		
Seeking information	No	Yes
Communication	No	Yes
Social Media	No	Yes
E-commerce	No	Yes
E-government	No	Yes
E-learning	No	Yes
<b>Origin of the seller</b>		
Outside the EU	No	Yes
<b>Digital skills</b>		
Digital skills	None or low level	Basic level Higher level

Source: own research using “European Union survey on ICT usage in households and by individuals 2015”

When we interpret the *odds ratios* ( $\text{Exp}(B)$ ) and begin to analyse the socioeconomic variables, we find that age is the major variable, especially with respondents who are between 55 and 64 years old. This age group further increases its likelihood of being on-line tourism purchasers when compared to respondents in the 16–24 year age range. Persons who live in densely populated areas are more likely to make an on-line purchase of this type of product than those living in sparsely populated zones (1.314 times more). People with a higher education level are also more likely to purchase than those with a primary education level (2.117 times more).

**Table 4** Marginal findings of the logistic regression for geographical location

Dependent variable: purchasing accommodation and travel via the Internet	Exp (B)	95% CI for EXP(B)		P value
		Lower	Higher	
Geographical location				
Less developed regions*				0.005
Regions in transition (1)	2.481	2.350	2.619	0.000
More developed regions (2)	2.962	2.857	3.071	0.000
Number of cases	150.035			
Cox and Snell's pseudo R <sup>2</sup>	0.352			
Nakelkerke's pseudo R <sup>2</sup>	0.511			
Cut-off point	0.5			
% of cases correctly classified	82%			

Source: own research using the "European Union survey on ICT usage in households and by individuals 2015"

\*Reference category

Those who connect to the Internet outside the home or work using a mobile network are 1.534 times more likely to purchase than those who do not make this type of connection. Furthermore, those who have a broadband connection at home are 1.589 times more likely to purchase these products than those who do not.

Having made an on-line purchase of other goods and services unrelated to tourism in the past 12 months stands out among the different uses to which the Internet is put. Making such purchases increases the likelihood of tourism purchases by 17.187. This is the most influential variable.

Having purchased from a seller outside the EU makes it more likely that such persons will purchase tourism services than not purchase them (1.799 times more probable).

## 4.2 Findings for the estimation in the regions in transition

In this case, 10,164 respondents were selected from a single random sample and the logical regression was estimated. A Cox and Snell R-squared adjustment of 31.2% and a Nagelkerke R-squared adjustment of 44% were obtained, and the value yielded for the Hosmer and Lemeshow Test was 0.937. This model managed to correctly classify 78.5% of the global, 63.7% of the digital purchasers of tourism and 85.2% of the non-purchasers (the cut-off point is 0.5). In view of the results we can rest assured that the adjustment is good for the logistic regression. The findings are shown in Table 6.

The (B) coefficients are positive for all the significant variables, so an increase in each one of them, in relation to the reference category, is going to mean an increase in the likelihood of purchasing tourism products via the Internet.

On interpreting the *odds ratios* (Exp(B)), as part of the sociodemographic variables, it must be mentioned that the respondents who are 65 or over are 3.677 times more likely to be digital consumers of tourism than those in the 16–24 year bracket.

**Table 5** Findings for logistic regression in less developed regions

Dependent variable: purchasing accommodation and travel via the Internet	Exp(B)	95% CI for EXP (B)		P value
		Lower	Higher	
<b>Population density</b>				
Sparse*				0.005
Dense (1)	1.314	1.115	1.549	0.001
Intermediate (2)	1.170	0.981	1.395	0.080
<b>Age</b>				
From 16 to 24 years*				0.000
From 25 to 34 years (1)	1.309	1.016	1.686	0.037
From 35 to 44 years (2)	1.657	1.275	2.155	0.000
From 45 to 54 years (3)	1.969	1.484	2.613	0.000
From 55 to 64 years (4)	2.237	1.641	3.050	0.000
65 years or over (5)	1.987	1.284	3.075	0.002
<b>Educational level</b>				
Primary*				0.000
Secondary (1)	1.502	1.111	2.030	0.008
Higher (2)	2.117	1.540	2.911	0.000
<b>Connection to the Internet</b>				
Mobile broadband (yes)	1.472	1.269	1.708	0.000
Fixed broadband (yes)	1.589	1.240	2.035	0.000
Connection to the Internet via mobile network or USB outside the home in last 3 months (yes)	1.534	1.310	1.798	0.000
Connection to the Internet by Wi-Fi outside the home in last 3 months (yes)	1.432	1.227	1.672	0.000
<b>Digital skills global</b>				
None or low level*				0.000
Basic level (1)	1.620	1.278	2.053	0.000
Higher level (2)	2.411	1.888	3.079	0.000
<b>Use of the Internet</b>				
E-commerce in last 12 months (yes)	17.187	13.395	22.053	0.000
E-government in last 12 months (yes)	1.726	1.462	2.039	0.000
E-learning in last 12 months (yes)	1.188	1.032	1.366	0.016
<b>Seller's origin: purchase 12 months</b>				
Seller outside the EU (yes)	1.799	1.506	2.149	0.000
Constant	0.000			0.000
Number of cases	10.933			
Cox and Snell's pseudo R <sup>2</sup>	0.23			
Nakelkerke's pseudo R <sup>2</sup>	0.438			
Cut-off point	0.5			
% of cases correctly classified	88.5			
Hosmer and Lemeshow test	0.805			

The variables that are statistically insignificant in all categories are not reported in the table

Source: own research using the "European Union survey on ICT usage in households and by individuals 2015"

\*Reference category

Having a higher level of digital skills makes an individual 1.943 times more likely to be a digital consumer of tourism than a person with a low or negligible level of digital skills.

It must be pointed out that having made on-line purchases increases by 9.478 the likelihood of purchasing tourism products when compared to those who have not done so, this variable being the most influential one.

### 4.3 Findings for the estimation in the most economically developed regions

A total of 12,020 respondents were selected by simple random sampling to conduct the logistic regression analysis. The findings can be seen in greater detail in Table 7. A Cox and Snell R-squared of 36.1% and a Nagelkerke R-squared of 49.5% were obtained, and the value of  $p$  for the Hosmer and Lemeshow Test was 0.296. The fact that the latter was greater than 0.05, is indicative of the goodness of the adjustment (Rodríguez and Gutiérrez 2007) Furthermore, this model managed to correctly classify 79% of the global, 75% of the digital purchasers of tourism and 81.2% of the non-purchasers (the cut-off point is 0.5).

Having made on-line purchases in the past 12 months is the most influential variable when it comes to increasing the likelihood of purchasing products associated with tourism, given that doing so is 16.880 times more probable than if one has not been directly involved in e-commerce activities. In this sense, if they have indulged in e-government activities, it is 2.004 times more likely that they will purchase products associated with tourism than if they have not done so.

The (B) coefficients are positive for all the significant variables, so an increase in each one of them, in relation to the reference category, is going to mean an increase in the likelihood of purchasing tourism products via the Internet.

On interpreting the *odds ratios* ( $\text{Exp}(B)$ ), the respondents who are 65 years old or more are 3698 times more likely to purchase these types of goods or services than those in the 16–24 year bracket.

With regard to both the level of education and the level of digital skills, and taking the lowest levels as the reference, the likelihood of purchase increases (2.101 for higher education when compared to primary education and 2.003 for greater digital skills when compared to those whose skill level is low or negligible).

## 5 Discussion

By comparing the results of the logistic regression applied to each one of the models, it can be seen in Table 8 that the fact individuals use the Internet for communication purposes or to indulge in social media activities, does not mean they are going to be more likely to purchase online tourism products in any of the regions analysed.

There are some differences between the regions considered regarding the variables that were included in the analysis and those that are statistically significant in all or some of the categories taken into account.

**Table 6** Findings for logistic regression in the regions in transition

Dependent variable: purchasing accommodation and travel via the Internet	Exp (B)	95% CI for EXP (B)		P value
		Lower	Higher	
<b>Population density</b>				
Sparse*				0.002
Dense (1)	1.197	1.054	1.359	0.006
Intermediate (2)	0.966	0.852	1.095	0.592
<b>Age</b>				
From 16 to 24 years*				0.000
From 25 to 34 years (1)	1.456	1.165	1.818	0.001
From 35 to 44 years (2)	1.858	1.490	2.316	0.000
From 45 to 54 years (3)	2.163	1.726	2.711	0.000
From 55 to 64 years (4)	2.632	2.084	3.323	0.000
65 years or over (5)	3.677	2.814	4.806	0.000
<b>Educational level</b>				
Primary*				0.000
Secondary (1)	1.631	1.386	1.919	0.000
Higher (2)	2.382	2.005	2.830	0.000
<b>Employment</b>				
Unemployed*				0.000
Employed or self-employed (1)	2.146	1.758	2.620	0.000
Inactive (2)	1.451	1.151	1.828	0.002
<b>Connection to the Internet</b>				
Fixed broadband (yes)	1.234	1.044	1.459	0.014
Connection to the Internet via mobile network or USB outside the home in last 3 months (yes)	1.187	1.048	1.344	0.007
Connection to the Internet by Wi-Fi outside the home in last 3 months (yes)	1.613	1.435	1.814	0.000
<b>Digital skills global</b>				
None or low level*				0.000
Basic level (1)	1.334	1.139	1.563	0.000
Higher level (2)	1.943	1.635	2.309	0.000
<b>Use of the Internet</b>				
Looking for information in last 3 months (yes)	1.615	1.216	2.145	0.001
E-commerce in last 12 months (yes)	9.478	8.083	11.115	0.000
E-government in last 12 months (yes)	1.963	1.739	2.216	0.000
<b>Seller's origin: purchase 12 months</b>				
Seller outside the EU (yes)	1.477	1.276	1.709	0.000
<b>Constant</b>				
Number of cases	10.164			
Cox and Snell's pseudo R <sup>2</sup>	0.312			
Nakelkerke's pseudo R <sup>2</sup>	0.44			
Cut-off point	0.5			
% of cases correctly classified	78.5			
Hosmer and Lemeshow test	0.937			

**Table 6** (continued)

The variables that are statistically insignificant in all categories are not reported in the table

Source: own research using the "European Union survey on ICT usage in households and by individuals 2015"

\*Reference category

Regarding the population density in the zone where the usual home is, the intermediate density category has no effect in any of the regions, whereas in the case of densely populated zones, the likelihood of being a purchaser of tourist products via the Internet is greater in the Less Developed Regions than in the rest of the Regions studied (1.3 times more than in sparsely populated zones, whereas in the rest of the regions this value is 1.2).

As far as the age variable is concerned, as age increase so does the likelihood of being a digital tourist in all the Regions. However, in the Less Developed Regions, the category that shows the most significant increase is among individuals who are between 56 and 64 years old (an odds ratio of 2.377), there being a decrease for individuals over 65. However, this behaviour is not the same in the rest of the Regions, given that for individuals over 65 the increase continues, making it the category where individuals are most likely to purchase via the Internet, although it is true to say that the odds ratio among them is virtually the same (3.677 for the Regions in Transition and 3.698 for the More Developed Regions).

The most outstanding aspect of the sex variable is that being a woman increases the probability of deciding to purchase tourism via the Internet only in the More Developed Regions, whereas this variable is not statistically significant for the rest of the Regions, so no distinctions can be made where this variable is concerned.

The behaviour of digital tourism consumers is the same for all the development regions. As the levels rise in relation to the reference category there is an increase in the likelihood of purchase, the values being very similar in all the regions.

The employment level does not affect the decision to purchase products via the Internet in the Less Developed Regions, whereas in the rest of the Regions the behaviour is different. In the More Developed Regions what has an effect is that the individual is in the employee or the self-employed bracket, whereas in the Regions in Transition all the categories are significant.

Broadband connection to the Internet at home does not have an effect on purchasing via the Internet in the Developing Regions (regardless of whether the connection is fixed or mobile), and in the Regions in Transition only having fixed broadband makes a difference, whereas in the Less Developed Regions both types of connection in the home increase the likelihood of tourism products being consumed. Connections to the Internet outside the home or work are influential variables in all the Regions, but consumer behaviour is different. Connection via mobile network or USB has a greater influence in the Less Developed Regions, whereas Wi-Fi connection is more influential in the More Developed Regions.

Higher levels of global digital competence increase the probability of e-tourism purchase in all regions. However, it must be pointed out that in the Less Developed

**Table 7** Findings for logistic regression in the most economically developed regions

Dependent variable: purchasing accommodation and travel via the Internet	Exp (B)	95% CI for EXP (B)		P value
		Lower	Higher	
Population density				
Sparse*				0.015
Dense (1)	1.198	1.060	1.354	0.004
Intermediate (2)	1.105	0.972	1.256	0.126
Age				
From 16 to 24 years*				0.000
From 25 to 34 years (1)	1.319	1.086	1.603	0.005
From 35 to 44 years (2)	1.783	1.468	2.165	0.000
From 45 to 54 years (3)	1.970	1.617	2.400	0.000
From 55 to 64 years (4)	2.398	1.953	2.943	0.000
65 years or over (5)	3.698	2.920	4.684	0.000
Sex				
Male*				
Female (1)	1.212	1.100	1.335	0.000
Educational level				
Primary*				0.000
Secondary (1)	1.440	1.238	1.675	0.000
Higher (2)	2.101	1.785	2.473	0.000
Employment				
Unemployed*				0.000
Employed or self-employed (1)	1.830	1.473	2.273	0.000
Inactive (2)	1.202	0.946	1.527	0.132
Connection to the Internet				
Connection to the Internet via mobile network or USB outside the home in last 3 months (yes)	1.298	1.160	1.452	0.000
Connection to the Internet by Wi-Fi outside the home in last 3 months (yes)	1.551	1.392	1.729	0.000
Digital skills global				
None or low level*				0.000
Basic level (1)	1.228	1.055	1.430	0.008
Higher level (2)	2.003	1.700	2.360	0.000
Use of the Internet				
Looking for information in last 3 months (yes)	1.498	1.133	1.980	0.005
E-commerce in last 12 months (yes)	16.880	14.362	19.840	0.000
E-government in last 12 months (yes)	2.004	1.789	2.245	0.000
E-learning in last 12 months (yes)	1.131	1.011	1.265	0.032
Seller's origin: purchase 12 months				
Seller outside the EU (Yes)	1.745	1.523	2.000	0.000
Constant	0.002			0.000
Number of cases	12.020			
Pseudo R <sup>2</sup> de Cox y Snell	0.361			

**Table 7** (continued)

Dependent variable: purchasing accommodation and travel via the Internet	Exp (B)	95% CI for EXP (B)		P value
		Lower	Higher	
Population density	0.495			
Sparse*	0.5			
Dense (1)	79			
Intermediate (2)	0.296			

The variables that are statistically insignificant in all categories are not reported in the table

Source: own research using the “European Union survey on ICT usage in households and by individuals 2015”

\*Reference category

Regions, the effect on likelihood is greater than in the rest of the Regions (2.4 more likely, compared to 1.94 and 2.00 for the rest).

E-commerce stands out where Internet use is concerned. This is the most influential variable, the difference being much more significant than the rest of the variables analysed. Behaviour also varies greatly from one Region to another when it comes to the effect of influence on probability. An increase in the likelihood of purchasing tourism products via the Internet is very similar for the Less and More Developed Regions, the values being very similar (17.2 and 16.7, respectively), amounting to a rise of 80% when compared to the Regions in Transition (9.48).

Purchasing from a seller whose is based outside the European Union also increases the likelihood of purchasing tourism products in all the Regions, but less so in the Regions in Transition and more so in the Less Developed Regions, albeit with values very similar to those for the More Developed Regions.

If we take into account the *odds ratios* for the variables that are significant for each one of the regions, we can create a profile for the online purchaser of tourism products for each one of the zones studied. When the variables fall into more than two categories, what has been taken into account is the category with the greatest influence (*odds ratio*). Table 8 shows these variables for each one of the Regions on the basis of the influence (advantage) that each one has, in order to establish the profile in each one of the Regions. The table also arranges them in order of influence, from greatest to least.

If the variables that amount to a marginal effect on the increase of likelihood of purchasing tourism via the Internet equivalent to or greater than two (odds ratio) are considered for all the Regions, the variables that stand out are e-commerce, age (with a different age bracket for the Less Developed Regions) and higher education level. The digital competence level lies in this group for the Less or More Developed Regions, and the Regions in Transition have a very close value. Using the Internet for e-government, doubles the likelihood in the More Developed Regions and almost doubles it in the Regions in Transition.

Apart from a genuine characterisation of the e-tourists' behaviour and use of ICTs at a theoretical level, the main contributions made by this research are summarized in the conclusions.



**Table 8** Comparing the logistic regression results in the developed regions

Dependent variable: purchasing accommodation and travel via the Internet	Less developed regions		Regions in transition		Most developed regions	
	Odds ratio	Weight order**	Odds ratio	Weight order**	Odds ratio	Weight order**
<b>Population density</b>						
Sparse*						
Dense (1)	1.314	11°	1.197	11°	1.198	12°
Intermediate (2)	–		–		–	
<b>Age</b>						
From 16 to 24 years*						
From 25 to 34 years (1)	1.309		1.456		1.319	
From 35 to 44 years (2)	1.657		1.858		1.783	
From 45 to 54 years (3)	1.969		2.163		1.97	
From 55 to 64 years (4)	2.237	3°	2.632		2.398	
65 years or over (5)	1.987		3.677	2°	3.698	2°
<b>Sex</b>						
Female (yes)	–		–		1.212	11°
<b>Educational level</b>						
Primary*						
Secondary (1)	1.502		1.631		1.44	
Higher (2)	2.117	4°	2.382	3°	2.101	3°
<b>Employment</b>						
Unemployed*						
Employed or self-employed (1)	–		2.146	4°	1.83	6°
Inactive (2)	–		1.451		–	
<b>Connection to the Internet</b>						
Mobile broadband (yes)	1.472	9°	–		–	
Fixed broadband (yes)	1.589	7°	1.234	10°	–	

Table 8 (continued)

Dependent variable: purchasing accommodation and travel via the Internet	Less developed regions		Regions in transition		Most developed regions	
	Odds ratio	Weight order**	Odds ratio	Weight order**	Odds ratio	Weight order**
Connection to the Internet via mobile network or USB outside the home in last 3 months (yes)	1.534	8°	1.187		1.298	10°
Connection to the Internet by Wi-Fi outside the home in last 3 months (yes)	1.432	10°	1.613	8°	1.551	8°
Digital skills global						
None or low level*						
Basic level (1)	1.62		1.334		1.228	
Higher level (2)	2.411	2°	1.943	6°	2.003	5°
Use of the Internet						
Looking for information in last 3 months (yes)	–		1.615	7°	1.498	9°
Communication in last 3 months (yes)	–		–		–	
Social media in last 3 months (yes)	–		–		–	
E-commerce in last 12 months (yes)	17.187	1°	9.478	1°	16.88	1°
E-government in last 12 months (yes)	1.726	6°	1.963	5°	2.004	4°
E-learning in last 12 months (yes)	1.188	12°	–		1.131	13°
Seller's origin: purchase 12 months						
Seller outside the EU (yes)	1.799	5°	1.477	9°	1.745	7°

Source: own research on the basis of the logistic regression results for each region

– Statistically insignificant

\*The variable with the highest odds ratio has been chosen for variables with several statistically significant categories

\*\*Order of influence only for categories with a higher odds ratio

## 6 Conclusions

The study has brought to light the changes in behavioural patterns in the different European areas on the basis of their economic development. The discussion has separated the various factors and revealed the findings by types of region. This would be the first conclusion: digital behaviour and the factors making that behaviour more likely in the field of e-tourism, vary depending on economic development, and it is possible to detect a degree of divergence in behaviour on a European level.

It is also clear that having carried out e-commerce activities beforehand in other areas is by far the most important factor. Any other factor is irrelevant when compared to the importance of having prior on-line experience. This finding amounts to a clarifying observation, setting and this study apart from other research approaches that focus excessively on socioeconomic factors, and contributing to the amount of research about the uncertainty regarding on-line tourism booking, transaction security and trust (Wu and Chang 2005). Our results are aligned with the model devised by Gursoy and McCleary (2004), which proposes that familiarity and expertise, learning and previous visits have an indirect influence on the search for immediate pre-purchase information needs, in an online shopping environment, prior online purchase experience helps to dispel uncertainties and eventually leads to an increase in customer purchase intention (Thamizhvanan and Xavier 2013).

The importance of age, connectivity, acquiring digital skills and the way the Internet is used are all secondary factors that have effects varying from one region to another. In any case, one major finding is the role of the senior segment. Therefore, our study includes this important finding, since little research has been done into the influence of the Internet and the type of product acquired in the senior market (Vigolo and Confente 2013). On the other hand, being a woman increases the probability of deciding to purchase tourism via the Internet only in the More Developed Regions, therefore, linking economic development with gender could be an interesting subject of future research. Furthermore, the e-tourist profile seems to be dynamic, in the sense that e-tourists acquire expertise and competence, which serves as an incentive to keep on researching.

Our study conducted a pan-European analysis, which was the first time that particular approach was made to the subject, because in the past such research had always concentrated on specific countries. It is an approach that enables us to have a comprehensive overview of the situation for the EU as a whole.

This research work has certain limitations, most of which arise from the characteristics inherent to the Eurostat questionnaire, making it difficult to obtain standardised data for all the countries and to incorporate a large amount of dichotomous variables. The amount of variables together with the very high number of registers, greatly complicates a quantitative analysis. Furthermore, the analysis only focused on the early phases of the e-tourism process, but ICT is also present when tourists are already travelling (Bai 2015), or to inform about their travel experiences after the journey (Morrison et al. 2001; Kim et al. 2009; Ho and Lee 2015).

In spite of this, the genuine observations included here provide new insights into the reality of the European tourist in the digital era, and somehow extends the scope

of the usual eTourism marketing studies on the profile of the digital tourist. Considering the fact that there are very few studies on this subject that include a multi-country perspective, the article contributes to the academic literature on a question that is very important to the EU economy: it opens an approach that is more ambitious, from a geographical viewpoint, and links the question to regional development, which is an original contribution that deserves focused research.

The huge amount of data provided by the responses to the questionnaire has opened up new avenues of research. Such information will help researchers to obtain greater in-depth knowledge about the different aspects mentioned here or to consider other methodologies for analysing and comparing the data. We propose that this pan-European approach should be explored still further, in view of the importance of tourism to Europe, particularly e-tourism, which is one of Europe's major sources of wealth in the 21st Century.

## References

- Abou-Shouk M, Lim WM, Megicks P (2013) Internet adoption by travel agents: a case of Egypt. *Int J Tour Res* 15(3):298–312
- Agag G, El-Masry AA (2016) Understanding the determinants of hotel booking intentions and moderating role of habit. *Int J Hosp Manag* 54:52–67
- Ajzen I (1991) The theory of planned behavior. *Organ Behav Hum Decis Process* 50(2):179–211
- Amaro S, Duarte P (2013) Online travel purchasing: a literature review. *J Travel Tour Mark* 30(8):755–785
- Amaro S, Duarte P (2015) An integrative model of consumers' intentions to purchase travel online. *Tour Manag* 46:64–79
- Ayeh JK, Au N, Law R (2013) Predicting the intention to use consumer-generated media for travel planning. *Tour Manag* 35:132–143
- Bai H (2015) An examination of customers' adoption of restaurant search mobile applications. Doctoral dissertation, Auckland University of Technology, Auckland
- Bilgihan A, Okumus F, Cobanoglu C (2013) Generation Y travelers' commitment to online social network websites. *Tour Manag* 35:13–22
- Buhalis D, Jun SH (2011) E-tourism. *Contemp Tour Rev* 1:2–38
- Buhalis D, Law R (2008) Progress in information technology and tourism management: 20 years on and 10 years after the Internet—the state of eTourism research. *Tour Manag* 29(4):609–623
- Buhalis D, Licata MC (2002) The future eTourism intermediaries. *Tour Manag* 23(3):207–220
- Buhalis D, O'Connor P (2005) Information communication technology revolutionizing tourism. *Tour Recreat Res* 30(3):7–16
- Cabezudo RSJ, Gutiérrez R, Gutiérrez J (2004) Determinantes de la eficacia publicitaria del sitio web, Una aplicación del ELM. *Rev Esp Investig Mark ESIC* 8(2):93–121
- Cardoso J, Lange C (2007) A framework for assessing strategies and technologies for dynamic packaging applications in e-tourism. *Inf Technol Tour* 9(1):27–44
- Chen SC, Shoemaker S (2014) Age and cohort effects: the American senior tourism market. *Ann Tour Res* 48:58–75
- Chen YC, Shang RA, Li MJ (2014) The effects of perceived relevance of travel blogs' content on the behavioral intention to visit a tourist destination. *Comput Hum Behav* 30:787–799
- Chung N, Koo C (2015) The use of social media in travel information search. *Telemat Inf* 32(2):215–229
- Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q* 13(3):319e340
- Drèze X, Hussherr FX (2003) Internet advertising: is anybody watching? *J Interact Mark* 17(4):8–23
- Escobar-Rodríguez T, Carvajal-Trujillo E (2014) Online purchasing tickets for low cost carriers: an application of the unified theory of acceptance and use of technology (UTAUT) model. *Tour Manag* 43:70–88

- Filieri R, McLeay F (2014) E-WOM and accommodation: an analysis of the factors that influence travelers' adoption of information from online reviews. *J Travel Res* 53(1):44–57
- Fischer MM, Stumpner P (2008) Income distribution dynamics and cross-region convergence in Europe. *J Geogr Syst* 10(2):109–139
- Fishbein M, Ajzen I (1975) *Belief, attitude, intention and behaviour: an introduction to theory and research*. Addison-Wesley, Reading
- Fleischer A, Felsenstein D (2004) Face-to-face or cyberspace? Choosing the Internet as an intermediary in the Israeli travel market. *Tour Econ* 10(3):345–359
- Fodor O, Werthner H (2005) Harmonise: a step toward an interoperable e-tourism marketplace. *Int J Electr Commer* 9(2):11–39
- Frew AJ (2000) A critical analysis of tourism information technology research. In: Fesenmaier D (ed) *Information and communications technologies in tourism*. Springer, Vienna, pp 39–52
- Guo Y, Liu H, Chai Y (2014) The embedding convergence of smart cities and tourism internet of things in China: an advance perspective. *Adv Hosp Tour Res* 2(1):54–69
- Gursoy D, Chen JS (2000) Competitive analysis of cross cultural information search behavior. *Tour Manag* 21(6):583–590
- Gursoy D, McCleary KW (2004) An integrative model of tourists' information search behavior. *Ann Tour Res* 31(2):353–373
- Harrigan P, Evers U, Miles M, Daly T (2017) Customer engagement with tourism social media brands. *Tour Manag* 59:597–609
- Hernández-Méndez J, Muñoz-Leiva F (2015) What type of online advertising is most effective for eTourism 2.0? An eye tracking study based on the characteristics of tourists. *Comput Hum Behav* 50:618–625
- Herrero Á, San Martín H (2012) Developing and testing a global model to explain the adoption of websites by users in rural tourism accommodations. *Int J Hosp Manag* 31(4):1178–1186
- Heung VC (2003) Internet usage by international travellers: reasons and barriers. *Int J Contemp Hosp Manag* 15(7):370–378
- Ho CI, Lee PC (2015) Are blogs still effective to maintain customer relationships? An empirical study on the travel industry. *J Hosp Tour Technol* 6(1):5–25
- Jhahharia S, Pal SK, Verma S (2014) Wearable computing and its application. *Int J Comput Sci Inf Technol* 5(4):5700–5704
- Kaplanidou K, Vogt C (2006) A structural analysis of destination travel intentions as a function of web site features. *J Travel Res* 45:204–216
- Kaur K, Kaur R (2016) Internet of things to promote tourism: an insight into smart tourism. *Int J Recent Trends Eng Res IJRTER* 2(04):357–361
- Kim D, Kim S (2017) The role of mobile technology in tourism: patents, articles, news, and mobile tour app reviews. *Sustainability* 9(11):2082
- Kim E, Nam D, Stimpert JL (2004) The applicability of Porter's generic strategies in the digital age: assumptions, conjectures and suggestions. *J Manag* 30(5):569–589
- Kim WG, Ma X, Kim DJ (2006) Determinants of Chinese hotel customers' e-satisfaction and purchase intentions. *Tour Manag* 27:890–900
- Kim LH, Qu H, Kim DJ (2009) A study of perceived risk and risk reduction of purchasing air-tickets online. *J Travel Tour Mark* 26(3):203–224
- Kim MJ, Lee CK, Chung N (2013) Investigating the role of trust and gender in online tourism shopping in South Korea. *J Hosp Tour Res* 37(3):377–401
- Kim MJ, Chung N, Lee CK, Preis MW (2015) Motivations and use context in mobile tourism shopping: applying contingency and task–technology fit theories. *Int J Tour Res* 17(1):13–24
- Kounavis CD, Kasimati AE, Zamani ED (2012) Enhancing the tourism experience through mobile augmented reality: challenges and prospects. *Int J Eng Bus Manag* 4:10
- Lai IK (2015) Traveler acceptance of an app-based mobile tour guide. *J Hosp Tour Res* 39(3):401–432
- Law R, Leung R, Buhalis D (2009) Information technology applications in hospitality and tourism: a review of publications from 2005 to 2007. *J Travel Tour Mark* 26(5–6):599–623
- Law R, Qi S, Buhalis D (2010) Progress in tourism management: a review of website evaluation in tourism research. *Tour Manag* 31(3):297–313
- Law R, Buhalis D, Cobanoglu C (2014) Progress on information and communication technologies in hospitality and tourism. *Int J Contemp Hosp Manag* 26(5):727–750
- Leung R, Law R (2007) Analyzing research collaborations of information technology publications in leading hospitality and tourism journals: 1986–2005. *Inf Commun Technol Tour* 2007:547–556

- Li L, Buhalis D (2006) E-commerce in China: the case of travel. *Int J Inf Manag* 26(2):153–166
- Li X, Li XR, Hudson S (2013) The application of generational theory to tourism consumer behavior: an American perspective. *Tour Manag* 37:147–164
- Liburd JJ (2005) Sustainable tourism and innovation in mobile tourism services. *Tour Rev Int* 9(1):107–118
- Mahadevan R (2014) Understanding senior self-drive tourism in Australia using a contingency behavior model. *J Travel Res* 53(2):252–259
- Margarida Barreto A (2013) Do users look at banner ads on Facebook? *J Res Interact Mark* 7(2):119–139
- Mistilis N, Buhalis D, Gretzel U (2014) Future eDestination marketing: perspective of an Australian tourism stakeholder network. *J Travel Res* 53(6):778–790
- Morrison AM, Jing S, O’Leary JT, Cai LA (2001) Predicting usage of the internet for travel bookings: an exploratory study. *Inf Technol Tour* 4(1):15–30
- Murphy J, Hofacker C, Gretzel U (2017) Dawning of the age of robots in hospitality and tourism: challenges for teaching and research. *Eur J Tour Res* 15:104–111
- Navío-Marco J, Ruiz-Gómez LM, Sevilla-Sevilla C (2018) Progress in information technology and tourism management: 30 years on and 20 years after the internet—revisiting Buhalis and Law’s landmark study about eTourism. *Tour Manag* 69:460–470
- Niehaves B, Plattfaut R (2014) Internet adoption by the elderly: employing IS technology acceptance theories for understanding the age-related digital divide. *Eur J Inf Syst* 23(6):708–726
- Nusair K, Erdem M, Okumus F, Bilgihan A (2012) Users attitudes toward online social networks in travel. *Social media in travel, tourism and hospitality: theory, practice and cases*. Ashgate Publication, Farnham
- Overman HG, Puga D (2002) Unemployment clusters across Europe’s regions and countries. *Econ Policy* 17(34):115–148
- López-Roldán P, Fachelli S (2015) Metodología de la Investigación Social Cuantitativa. Bellaterra (Cerdanyola del Vallès): Dipòsit Digital de Documents, Universitat Autònoma de Barcelona. 1ª edición. Edición digital. <http://ddd.uab.cat/record/129382>. Accessed 30 Apr 2018
- Parsa HG, Cobanoglu C (2011) Building a model of commitment for Generation Y: an empirical study on e-travel retailers. *Tour Manag* 32(4):833–843
- Pesonen JA (2013) Information and communications technology and market segmentation in tourism: a review. *Tour Rev* 68(2):14–30
- Pesonen J, Komppula R, Riihinen A (2015) Typology of senior travellers as users of tourism information technology. *Inf Technol Tour* 15(3):233–252
- Ramsay G, Dodds R, Furtado D, Mykhayletska Y, Kirichenko A, Majedian M (2017) The barriers to millennials visiting Rouge Urban National Park. *Sustainability* 9(6):904
- Rodríguez CY, Gutiérrez J (2007) Empleo de modelos de regresión logística binomial para el estudio de variables determinantes en la inserción laboral de egresados universitarios. *Investig Postgrado* 22(1):109–144
- Rogers EM (1995) Diffusion of innovations. The Free Press, New York
- Schröder A, Widmann T (2007) Demographic change and its impact on the travel industry: oldies—nothing but goldies?. In: *Trends and issues in global tourism 2007*. Springer, Berlin, pp 3–17
- Sigala M (2004) Reviewing the profile and behaviour of internet users. *J Travel Tour Mark* 17(2–3):93–102
- Srivastava AP, Dhar RL (2016) Technology leadership and predicting travel agent performance. *Tour Manag Perspect* 20:77–86
- Suki NM, Suki NM (2017) Flight ticket booking app on mobile devices: examining the determinants of individual intention to use. *J Air Transp Manag* 62:146–154
- Szopiński T, Staniewski MW (2016) Socio-economic factors determining the way e-tourism is used in European Union member states. *Internet Res* 26(1):2–21
- Thamizhvanan A, Xavier MJ (2013) Determinants of customers’ online purchase intention: an empirical study in India. *J Indian Bus Res* 5(1):17–32
- Turban E, King D, McKay J, Marshall P, Lee J, Viehland D (2008) *Electronic commerce: a managerial perspective*. Pearson-Prentice Hall, Upper Saddle River
- Ukpabi DC, Karjaluoto H (2017) Consumers’ acceptance of information and communications technology in tourism: a review. *Telemat Inf* 34(5):618–644
- Venkatesh V, Davis FD (2000) A theoretical extension of the technology acceptance model: four longitudinal field studies. *Manag Sci* 46(2):186–204

- Vigolo V, Confente I (2013) Older tourists: an exploratory study on online behaviour. In: Xiang Z, Tussyadiah I (eds) *Information and communication technologies in tourism 2014*. Springer, Cham, pp 439–452
- Vijay R, Kushwaha VK, Chaudhury AS, Naik K, Gupta I, Kumar R, Wate SR (2016) Assessment of tourism impact on land use/land cover and natural slope in Manali, India: a geospatial analysis. *Environ Earth Sci* 75(1):20
- Von Lyncker K, Thoennesen R (2017) Regional club convergence in the EU: evidence from a panel data analysis. *Empir Econ* 52(2):525–553
- Wang YS, Li HT, Li CR, Zhang DZ (2016) Factors affecting hotels' adoption of mobile reservation systems: a technology-organization-environment framework. *Tour Manag* 53:163–172
- Warschauser M (2004) *Technology and social inclusion. Rethinking the digital divide*. MIT Press, Cambridge
- Weber K, Roehl WS (1999) Profiling people searching for and purchasing travel products on the World Wide Web. *J Travel Res* 37(3):291–298
- Wu JJ, Chang YS (2005) Towards understanding members' interactivity, trust, and flow in online travel community. *Ind Manage Data Syst* 105(7):937–954