

Exploring relationship variables and Information and Communication Technologies use in industrial segmentation

Exploring
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Abstract

Purpose – In tourism, the adoption of Information and Communication Technologies (hereinafter ICT) and variables concerning firms' links with suppliers have been recognized as key determinants to improve companies' competitiveness. From the perspective of efficient management of company resources, segmentation has become a key tool and is particularly significant and current in the business-to-business context. The purpose of this paper is to study the segmentation of firms in the tourist industry according to perceived ICT use and relationship value and benefits. In addition, from the management approach, the authors seek to describe the segments that enable the development of differentiated strategies aimed at consolidating relationship benefits in the long term.

Design/methodology/approach – Using a sample of 310 travel agencies who evaluated the relationship with their main supplier, the authors attempt to examine the utility of these variables as segmentation criteria for identifying heterogeneous groups.

Findings – The estimation of a finite mixture model suggests that these bases are able to discriminate firms into four latent segments with different levels of ICT use and relationship variables.

Research limitations/implications – This research contributes to the understanding of the role that ICT and relationship variables have in the segmentation processes of tourism companies. Literature on segmentation in the business-to-business (B2B) context is limited and it is hard to find studies which apply latent methodology using behavioral criteria related to the use of ICT and relationship variables.

Practical implications – Segmentation of the tourism organizational market based on valuations of supplier relations and ICT use can help suppliers to design or adapt differentiation marketing strategies. Since agencies place the most value on confidence and value, tourism service suppliers should focus their efforts on improving the elements of service provision that increase perceived trust/confidence and value (i.e. growing the number of contacts, proximity to customers or sincerity, etc.). If agencies feel they can rely more on their providers, they will value their relationship more positively thereby favoring its long-term continuity.

Originality/value – The novelty in this work lies in the application of latent segmentation methodology and the simultaneous use of bases associated with ICT and relationship variables in B2B tourism.

Keywords Relationship value, Finite mixture model, Relationship benefits, Information and Communication Technologies (ICT)

Paper type Research paper

1. Introduction

The complexity of the industrial market lies mainly in the variety of parties involved and the simultaneous nature of companies' roles. Therefore, as can be seen from the extensive business-to-business hereinafter B2B literature, it is crucial to design strategies designed to create, between the organizations involved, positive relationships that enable them to collaborate and continue with their transactions (Wu *et al.*, 2015). Companies invest large amounts of resources in building and maintaining relationships with



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their key stakeholders with the aim of developing sustainable competitive advantages (Brito *et al.*, 2014), and as recent works show (see Huo *et al.*, 2015; Abosag *et al.*, 2016; Lilien, 2016; Schmitz *et al.*, 2016, among others), study of this topic is of enormous interest.

Despite the emphasis in the literature on analysis of the consequences of interfirm collaboration, knowledge is still scanty of the conditions in which relationships become beneficial or a problem, depending on how they are managed (Heirati *et al.*, 2016). And this is true especially in companies that operate in competitive and turbulent environments like tourism (UNWTO, 2015), where businesses engage in a wide variety of B2B strategies for different groups of suppliers. In this context, managing market-based resources to create marketing relationships becomes a main focus for the organization (Davicik and Sharma, 2016).

One of the key tools for efficient resource management in business practice is segmentation (Roberts *et al.*, 2014). Although consumer segmentation and industrial segmentation are well researched in management, industrial segmentation has received less attention from the academic and business practice perspectives, especially when the focus is supplier-customer relations, analyzed from a normative perspective (Rezaei and Ortt, 2013; Thomas, 2016). There are also conceptual and methodological disagreements over the application of segmentation criteria and methods, and over their suitability in different contexts and situations. In recent years, methods have improved and latent segmentation methodology has been developed (e.g. Roberts *et al.*, 2014; Casabayó *et al.*, 2015; among others). One of the main advantages of these *post hoc* approaches is that the size and structure of the segment is estimated simultaneously (Wedel and Kamakura, 2000) and it enables predictions on dependent variables under a common modeling structure (Fuentes-Blasco *et al.*, 2014).

In the B2B context, descriptive variables have traditionally been used to identify heterogeneous groups of firms. However, the literature suggests that criteria should move toward relationship variables, that is, ones which are associated to firms' evaluations of the ties linking them to their suppliers (e.g. Hosseini and Shabani, 2015; Heirati *et al.*, 2016; Schmitz *et al.*, 2016; Thomas, 2016). Following this approach, we consider particularly relevant the relationship value and the benefits stemming from said relationship as they are two of the most outstanding concepts in the relationship marketing literature, especially in the study of relationships between businesses (Moliner *et al.*, 2014). The literature highlights the importance of relationship value in strengthening affective links between the parties (La Rocca and Snehota, 2014; Hohenschwert and Geiger, 2015). In this process of value creation, relationship benefits play a fundamental role (Ulaga and Eggert, 2002) and several works have studied their contribution to satisfaction and loyalty (e.g. Wu *et al.*, 2015).

We must not ignore the importance of the use of Information and Communication Technologies (ICT) in the success of inter-organizational relations. This fact has been made clear in more recent works, which state that competitiveness depends on the quality of ICT-related innovations (e.g. Huo *et al.*, 2015; Daulatkar and Sangle, 2016; Hua, 2016; Berné *et al.*, 2015). One of the sectors most affected by these technological developments is the tourism industry. Although it has been pointed out that the spread of ICT favors disintermediation, these technologies represent significant opportunities for tourism businesses (Pastor *et al.*, 2014). Travel agencies in particular can strengthen relations with their suppliers through ICT, confirming the existence of a positive relationship between increased use of technologies and business performance (Berné *et al.*, 2015).

In view of the above considerations, segmentation still presents important challenges, particularly in the inter-organizational sphere (Rezaei *et al.*, 2015). Suppliers of services, especially in the tourism sector, must acknowledge the advantages of identifying groups of customers with not only different behaviors but also different perceptions and assessments of the quality of the relationship. According to the above arguments, our general objective

focuses on analyzing unobserved heterogeneity in firm's relationships with their main supplier in the tourism industry. In particular, we intend to:

- examine the utility of ICT use, relationship value and benefits (confidence, social benefits, special treatment benefits and convenience) as segmentation criteria for identifying heterogeneous groups of travel agencies; and
- describe the resulting segments with covariables for proposing relationship marketing strategies at segment level.

This present work is structured as follows. First, there is a review of the most relevant contributions on segmentation in the B2B context, on the importance of ICT for industrial relationships and on the concept of relationship value and benefits. Second, the methodology is described and the results of the analysis of latent segments are presented. Finally, there is a discussion of the conclusions, implications for tourism firm management and future research lines.

2. Conceptual framework

2.1 B2B segmentation

In highly competitive and heterogeneous markets, both academics and professionals recognize the importance of studying the differences between customers and segmentation as a basic tool for addressing the market efficiently and competing effectively. This approach is particularly important in the travel agency industry as the widespread use of internet is leading to disintermediation (Huo *et al.*, 2015; Daulatkar and Sangle, 2016). Travel agency results largely depend on firm ability to capture market loyalty and guarantee access to information while also providing added value services (Spralls *et al.*, 2011).

The market segmentation of firms is more complex than in the consumption market as the B2B environment presents difficulties such as cost and access to customers (Rezaei and Ortt, 2013). For that reason the activity sector, product category or geographical location of the company are frequently used as the basis for inter-organizational segmentation. Simkin (2008) criticizes this type of segmentation, considering that it is sectorisation rather than segmentation from the academic point of view. In this line, Rezaei and Ortt (2013) argue that in the study of industrial customer segmentation, there has been little focus on supply-side segmentation in comparison to demand-side B2B segmentation.

Therefore, other types of criteria are required beyond descriptive variables to enable better understanding of the complexity and diversity of firms' behavior. In this regard, some variables associated with the use of technologies and relationships with suppliers have been used to segment the B2B market (e.g. Weinstein, 2014; Kohtamäki and Partanen, 2016), however, studies of tourism businesses are relatively scanty.

Despite recognizing the importance of ICT in service organizations (Omerzel, 2016; Tsao *et al.*, 2016), relatively few empirical studies focus on ICT use in the B2B tourism industry. For example, Ruiz *et al.* (2013) obtain two clusters of hotels – traditional and technological ones – with significant differences in the degree of ICT use; and Guo *et al.* (2017), propose a categorization of dimensions on satisfaction levels in hotels, emphasizing the importance of analyzing heterogeneity in the relationship to generate greater levels of satisfaction.

As regards the use of relationship variables as segmentation criteria, the literature also offers some studies that have segmented the business market, which is more limited in the context of tourism B2B. For example, Tai and Ho (2010) explore the effects of information sharing on relationship intention in different segments according to relationship value in the manufacturing industry, and Weinstein (2014) makes a business segmentation based on psychographics. In general, the main weakness of these contributions is that they focus on one or two segmentation criteria.

Thus segmentation in the B2B tourism market is still limited and presents interesting challenges at an academic level. With these gaps in the literature, we consider that the study of different types of variables associated with ICT use and relationship variables to form tourism business segments would help to further segmentation research. Therefore we present below the conceptual framework on ICT use and the notions of relationship value and benefits in the inter-organizational context. This literature review will help to define our segmentation bases. In the empirical research we focus on examining their ability to discriminate into statistically heterogeneous groups of travel agencies.

2.2 ICT use

The evolution of the tourist industry is closely linked to the development of new technologies (Law *et al.*, 2010). The rapid evolution of ICT has radically changed conditions in the tourism market because it has provided businesses with new instruments to add value to the transactions, creating a more competitive environment (Berné *et al.*, 2015).

A large part of the literature has emphasized the role of ICT as tools that facilitate and strengthen relations between companies by allowing suppliers to contact and communicate with their customers (Berné *et al.*, 2015). In this regard, many advantages of ICT adoption have been pointed out, such as cost reductions, improved customer satisfaction, increased market share, improved performance among employees, greater operating efficiency and the achievement of competitive advantages (Huo *et al.*, 2015). In contrast, some authors point out that technology can hinder the development of relationships because the emotional link created in face-to-face interactions with employees is reduced (Diaz *et al.*, 2015). Despite these stances, the use of ICT for managing the marketing channel has aroused academic and business interest (Breidbach and Maglio, 2016; Hua, 2016).

Various conceptual studies and empirical evidence of ICT adoption in the inter-organizational environment have been offered (e.g. Berné *et al.*, 2015; Huo *et al.*, 2015; Wang and Cavusoglu, 2015; Breidbach and Maglio, 2016). In this regard, it has been observed that distributors feel more optimistic about the future of their relationships with suppliers when they perceive that they are investing in technology, so they commit more firmly to the supplier and customer loyalty increases (Huo *et al.*, 2015). However, there is still little research on the use of new technologies in tourism B2B. For example, Bastakis *et al.* (2004) note that ICT use can improve relations between the hotel industry, tour operators and travel agencies. Bigné *et al.* (2008) conclude that the intensity of relationships between travel agencies and their suppliers favors ICT adoption. In this line, Berné *et al.* (2015) also test whether tourism intermediaries intensify their relationship with their suppliers and tour operators through the role of ICT, improving their financial and market performance.

2.3 Relationship value

The concept of value is widely discussed in marketing management and so there is abundant literature. Two approaches can be clearly differentiated (Oliver, 1999): research into quality – or one-way cognitive perception – and research into the benefits-sacrifices relationship – or two-way assessment. Despite having many meanings, like customer value or perceived value, value has recently acquired a relationship marketing approach with the term relationship value (Ulaga, 2003).

Relationship value has recently come to be regarded as a key element in the study of inter-organizational relationships (Ulaga and Eggert, 2002, 2006; La Rocca and Snehota, 2014; Hohenschwert and Geiger, 2015; Marcos-Cuevas *et al.*, 2016) and it has become a crucial aspect for maintaining long-term cooperation between the parties (Tsao *et al.*, 2016).

The most representative definition of relationship value is the proposal from Eggert and Ulaga (2002, p. 110) cited in research over the last decade (e.g. Gil *et al.*, 2011; Hohenschwert and Geiger, 2015; Tsao *et al.*, 2016). These authors define relationship value in industrial markets as

the “trade-off between the multiple benefits and sacrifices of a supplier’s offering, as perceived by key decision-makers in the customer’s organization, and taking into consideration the available alternative suppliers’ offerings in a specific use situation.” This definition emphasizes the compensation or balance between benefits and sacrifices that the customer perceives in comparison to other providers. The benefits simply stem from the existence of a relationship, independently of the main service (Wu *et al.*, 2015), whereas the sacrifices are not limited to price alone, but also include switching costs, functional risk or the loss of special treatment, among others (Patterson and Smith, 2001). Some authors demonstrate the important contribution of relationship benefits to value (Uлага and Eggert, 2002; Barry and Terry, 2008; Moliner *et al.*, 2014), while others emphasize that the main factors in value generation in the B2B context are service quality and personal interaction (Eggert *et al.*, 2006).

There is agreement that what is important is how customers interpret value, not what providers believe value should be (La Rocca and Snehota, 2014). Hollyoake (2009) points out that the provider must be able to control the relationship by knowing how customers perceive the experience they receive. This customer perspective on the relationship has been the main focus in the B2B literature. Therefore, it can be concluded that relationship value is subjective, global, relative to the competition and related to the exchange of various benefits and sacrifices (Uлага and Eggert, 2006).

Thus from this relationship perspective, value can appear as different aspects of the relationship, beyond the transactional exchange of products or services (La Rocca and Snehota, 2014). As a result, the value generation process has been reconsidered (Uлага and Eggert, 2006), and relationship value is understood to depend on the content and consequences of a company’s relationship with its supplier.

The fundamental, subjective nature of value in the relationship can have an uneven impact on the success of company-supplier relations. The field of consumer markets provides fairly unrealistic evidence for the result of loyalty when differences in consumers’ perception of value are ignored (Becker *et al.*, 2013; Fuentes-Blasco *et al.*, 2014). And therefore, we consider value perceptions to be a subjective segmentation criterion which can partly explain the success of the relationship between a company and its supplier.

2.4 Relationship benefits

The contribution of relationship benefits to customer satisfaction and loyalty toward the service provider has been widely studied in service literature (Heirati *et al.*, 2016) and these effects have been more frequently confirmed in the consumer context than in B2B (Barry and Terry, 2008). Although various studies have studied the benefits for customers in long-term relations with tourism companies (Thao and Swierczek, 2008), little attention has been paid to the study of relationship benefits in tourism B2B (Ruiz-Molina *et al.*, 2015).

Relational benefits can be defined as the customer’s perception of the supply company’s efforts to increase value beyond the service received (De Wulf and Odekerken-Schröder, 2003). Just as value is based on the evaluation of an ongoing relationship (Ravald and Grönroos, 1996), relational benefits also stem from different exchanges rather than the main service provision (Wu *et al.*, 2015).

There is no conclusive evidence in the B2B context for the conceptualization of relationship benefits (Gil *et al.*, 2011) and several typologies of benefits have been proposed. For example, Uлага and Eggert (2002) distinguish between product, service, know-how, response speed and social benefits; Homburg *et al.* (2005) identify basic and added benefits; and Barry and Terry (2008) differentiate between basic benefits, supply benefits and operation benefits.

Additionally, Gwinner *et al.* (1998) offer a widely accepted typology of relationship benefits distinguishing three types of benefits derived from customers’ relationships

with their service provider: confidence (referring to low levels of anxiety and perceived transaction risk), social benefits (referring to the establishment of personal links between customers and employees, such as fraternization, friendship and personal recognition) and special treatment benefits (referring to economic advantages, time saving, customized services or preferential services for special customers). Specifically, social benefits are crucial in relations between companies (Sweeney and Webb, 2007). This type of benefits combined with special treatment benefits are key in personalized and high contact services (Gwinner *et al.*, 1998; Patterson and Smith, 2001) as in the case of tourism services.

Finally, as for functional benefits, it has been argued that convenience is one of the utilitarian advantages with significant influence on perceived value in a relationship (Spiteri and Dion, 2004). In particular, the literature has highlighted the importance of convenience, related to efficiency and its relationship with the value of time. On this line, Berry *et al.* (2002, p. 5) point out that “intrinsic perceptions of service convenience are the effort and time required to purchase or use a service.” Time, in the context of the relationship, reflects the dimension of negotiation time and/or supplier choice, rather than placing orders or delivering them.

Despite the well-known benefits of interfirm collaboration there is evidence to indicate that said relationship could be vulnerable under certain conditions (Heirati *et al.*, 2016). Among other reasons, the literature argues for the dynamic capacity of the relationship (Mitrega *et al.*, 2012) and contextual factors that can influence the result of that collaboration (Das and Rahman, 2010). The suggestion, therefore, is that the perception of the benefits of a company’s relationships with its supplier may vary widely depending on its situation and environment (Gil *et al.*, 2011).

3. Methodology

3.1 Measurement scales and information collection

To approach the answer of the research questions the empirical study was the relationship between Spanish tourism companies. In order to define our framework of study, the three largest Spanish cities (Madrid, Barcelona and Valencia) in terms of population and reference for the tourism industry (INE, 2016) were selected. The population consists of nationwide travel agencies in this geographical area, according to their national classification of economic activities (NACE) and tax on economic activities (TEA) codes. This information was extracted from an economic information database SABI[1] (Iberian Balance Sheet Analysis System) that includes information on Spanish and Portuguese firms. The population was 1,111 travel agencies.

A structured questionnaire was administered to agency managers in order to measure the company’s assessments of relationship benefits, relationship value, and ICT use with respect to its main supplier. In total, 310 surveys were completed achieving a 27.9 percent response rate. An initial characterization shows that almost 90 percent of the sample is retail travel agencies and 10 percent are tour operators. With regard to the company’s main suppliers, 70.2 percent are tour operators, 15.1 percent are transport suppliers, 11.1 percent are hotels and 3.6 percent are suppliers of other services.

The scales used to evaluate the research variables were proposed on the basis of the literature review. The intensity of ICT use scale is based on Wu *et al.* (2006). The relationship value scale comprises four items adapted from Ulaga and Eggert (2006). Regarding the relationship benefits, the confidence, social and special treatment benefits scales were adapted from Gwinner *et al.* (1998), and the convenience scale was adapted from Patterson and Smith (2001) and Servera-Francés *et al.* (2010). All item statements are measured on a five-point Likert scale (Table I).

Scales	Items	Standardized loadings (<i>t</i> -stat)
ICT's intensity of use the relationship agency-supplier $\alpha = 0.888$ CR = 0.818 AVE = 0.531	This supplier considers my opinion to coordinate and develop its ICT	0.893
	ICT advances in the relationship with my supplier are well coordinated for best commercial performance	0.902** (25.02)
	ICT in my company is always the latest technology	0.694** (12.33)
	Relative to our competitors, our communication systems are more advanced	0.758** (14.08)
Relationship value $\alpha = 0.899$ CR = 0.900 AVE = 0.693	The main supplier adds more value to the relationship overall	0.832
	We gain more in our relationship with the main supplier	0.816** (20.21)
	The relationship with the main supplier is more valuable	0.881** (23.67)
	This main supplier creates more value for us when comparing all costs and benefits in the relationships	0.799** (15.19)
Benefits I: confidence benefits $\alpha = 0.852$ CR = 0.856 AVE = 0.519	I believe there is less risk that something will go wrong	0.768
	I feel I can trust this supplier	0.726** (13.59)
	I am confident the service will be performed correctly by this supplier	0.705** (11.83)
	I am less anxious when I buy from this supplier	0.713** (12.77)
	I know what to expect from this supplier	0.615** (8.44)
	I get the supplier's highest level of service	0.699** (12.32)
	I am recognized by this supplier's employees	0.723
Benefit II: social benefits $\alpha = 0.915$ CR = 0.915 AVE = 0.683	I am familiar with the employee(s) that perform(s) the service	0.862** (13.56)
	I have developed a friendship with this supplier's employees	0.898** (12.76)
	They know me by name	0.858** (12.62)
	I enjoy certain social aspects of the relationship	0.779** (12.58)
	I get discount or deals from this supplier that most consumers do not	0.810
Benefit III: special treatment $\alpha = 0.891$ CR = 0.884 AVE = 0.605	The prices I get from this supplier are better than those other customers get	0.849** (21.56)
	They do services for me that they do not do for most customers	0.853** (18.87)
	I am placed higher on the priority list when there is a queue	0.705** (11.87)
	I get better service from my supplier that most of their customers	0.653** (11.40)
	The time required to buy from my supplier is appropriate	0.716
Benefit IV: convenience $\alpha = 0.689$ CR = 0.703 AVE = 0.543	I have fewer problems with this supplier	0.784** (7.43)
Scale correlations	Mean SD	1. 2. 3. 4. 5. 6.
1. ICT intensity	3.195 0.965	0.816 ^a
2. Relationship value	3.455 0.713	0.253 0.833
3. B I: confidence benefits	3.865 0.627	0.149 0.311 0.720
4. B II: social benefits	3.183 0.970	0.217 0.292 0.295 0.778
5. B III: special treatments	3.244 0.809	0.255 0.373 0.363 0.436 0.778
6. B IV: convenience	3.669 0.724	0.193 0.193 0.013 0.136 0.227 0.737

Notes: α = Cronbach's α ; CR, composite reliability; AVE, average variance extracted; SL, completely standardized loadings. Fit indexes: $\chi^2_{\text{Sat-B}}$ (df = 284) = 455.97 (p -value = 0.000); RMSEA = 0.046; CFI = 0.957; GFI = 0.887; BBNFI = 0.897; BB-NNFI = 0.951. ^aThe elements on the main diagonal represent the square root of the AVE. ** t -values are significant at p -value < 0.01

Table I.
Measurement
model estimation
(scales dimensionality,
reliability
and validity)

3.2 Measurement scale reliability, dimensionality and validity

An exploratory factor analysis was conducted to study scale dimensionality and reliability by Cronbach's α . Each dimension loaded on its latent factor, reaching optimum levels of the reliability index. To confirm dimensionality a first-order measurement model with robust maximum likelihood was estimated due to lack of normality in the data. Following Gerbing and Hamilton (1996), the correlation between latent constructs was verified to examine for a possible higher order between the factors that reflect the benefit scales. Taking the significance of the $\chi^2_{\text{Sat-Bt}}$ statistic, the global fit indexes show that the variables converged toward the dimensions established (RMSEA < 0.08; incremental non normalized fit index BBNFI > 0.9, compared fit index (CFI) > 0.9).

Before analyzing the validity of the measurement scales, we checked for potential problems of common method bias using Harman's one-factor test (Podsakoff *et al.*, 2003), loading all scale items on one latent factor. Fit indexes were $\chi^2_{\text{Sat-Bt}}$ (df = 299) = 2169.72; RMSEA = 0.147; CFI = 0.545 Comparing this estimation with the results in Table I for the measurement model with the six latent variables ($\Delta\chi^2_{\text{Sat-Bt}}$ = 911.25; Δ df = 18; p -value < 0.000001) we can conclude that the single-factor estimation had a significantly poorer fit.

We calculated the internal consistency of the dimensions, considering two indicators: composite reliability coefficient (CR) and average variance extracted (AVE), shown in Table I. All the reliability indexes were greater than the minimum threshold of 0.7 (Anderson and Gerbing, 1988) and AVE for each construct takes a value over 0.5 (Fornell and Larcker, 1981).

Construct validity was analyzed as follows: content validity is assumed since the scales are made up of items adapted from literature review and they measure the described constructs; convergent validity was confirmed for the scales as all the variables show significant and high standardized loadings (Anderson and Gerbing, 1988); and discriminant validity was analyzed through linear correlations or standardized covariances between the latent factors. After squaring, they are lower than the AVE, so we can conclude that each scale measures a different construct.

4. Results

After verifying the reliability and validity of the scales, we focused on verifying our first objective which was to study segment-level heterogeneity among the travel agencies in terms of the variables characterizing the relationship with their main supplier, that is, intensity of ICT use, relationship value and benefits associated with the relationship (confidence and social benefits, special treatment, and convenience).

In relation to segmentation procedures aimed at identifying heterogeneity at segment level, the literature has evolved toward modeling non-observed heterogeneity characteristic of behavioral bases using latent segmentation methodology. In particular, we attempted to determine the effectiveness of relationship variables as segmentation bases by estimating a finite mixture model. Using this methodology, travel agencies can be assigned to a segment on the basis of their likelihood of belonging to that segment based on the assumption that the data come from a mixture of probability distributions (McLachlan and Basford, 1988). As neither the segment nor the number of segments to which each travel agency belongs is known beforehand, the aim is to "undo the mixture" or recognize the sample's heterogeneity (Wedel and Kamakura, 2000). This model also shows several measures of performance to evaluate the discriminant capability of segmentation criteria.

Factor scores for the dimensions resulting from the measurement model were used as continuous indicators to estimate the finite mixture model. In addition, general descriptive information was included like the activity of the agency and the main supplier and descriptive criteria that help to profile the relationship (duration, percentage of sales, or number of alternative suppliers).

Estimation was done in an iterative process by increasing the initial random values and the iterative limits in the two-stage estimation-maximization algorithm. This procedure prevents a local maximum from matching up with the absolute optimum, making it possible to obtain the optimum number of segments or latent classes. The model was estimated from $s = 1$ (no heterogeneity) to $s = 7$ (seven latent segments). Table II shows the main fit indexes for each estimated model.

According to the BIC index, the best estimation is obtained with the model of four segments. This index related to model parsimony is more effective for determining the number of segments than other indexes (e.g. AIC, CAIC) (Vermunt and Magidson, 2005). Furthermore, the discriminant capacity index of Entropy Statistic (E_s) also indicated that the best estimation was achieved with four latent classes (Wedel and Kamakura, 2000).

Choosing this model as the optimal option segmentation, the four resulting segments have sizes $\pi_1 = 31.55$ percent (98 agencies), $\pi_2 = 21.16$ percent (84 agencies), $\pi_3 = 22.72$ percent (70 agencies), and $\pi_4 = 18.56$ percent (58 agencies).

In relation to the results of estimating these four latent segments, Table III shows the profile and estimated parameter for each segmentation criteria. The profile corresponds to

	-LL	BIC	AIC	CAIC	E_s	R^2	N° parameters
1 class	2,163.36	4,395.38	4,350.71	4,407.36	1.000	1.000	12
2 classes	1,912.13	4,018.76	3,892.27	4,052.76	0.8368	0.8652	34
3 classes	1,816.87	3,954.09	3,745.75	4,010.09	0.8624	0.8748	56
4 classes	1,741.23	3,928.64	3,638.46	4,006.64	0.8627	0.8603	78
5 classes	1,701.13	3,974.30	3,602.27	4,074.29	0.8307	0.8104	100
6 classes	1,674.74	4,047.36	3,593.49	4,169.36	0.8428	0.8195	122
7 classes	1,644.50	4,112.73	3,577.00	4,256.73	0.8524	0.8189	144

Table II.
Measures of performance to determine the optimal number of latent segments

	Mean (estimated parameter) (z-value)				Wald St. (p-value)	R^2
	Segment 1 (n = 98)	Segment 2 (n = 84)	Segment 3 (n = 70)	Segment 4 (n = 58)		
ICT intensity	2.524 (-0.7356) (-8.1313)**	3.4838 (0.2241) (2.4431)*	3.6052 (0.3456) (4.3896)**	3.4256 (0.1660) (1.412)	74.3187 (5.10E-16)	0.2274
Relationship value	2.8862 (-0.6522) (-10.1837)**	3.7351 (0.1966) (4.5461)**	3.3417 (-0.1968) (-3.9645)**	4.1908 (0.6523) (9.3453)**	176.7099 (4.50E-38)	0.4535
Confidence benefits	3.4986 (-0.4311) (-6.683)**	4.0537 (0.1239) (2.8003)**	3.6603 (-0.2694) (-5.4394)**	4.5062 (0.5765) (10.765)**	160.3834 (1.50E-34)	0.3512
Social benefits	2.2284 (-1.0489) (-13.0368)**	3.9712 (0.6939) (13.4532)**	3.0518 (-0.2255) (-4.0382)**	3.8577 (0.5805) (5.1054)**	461.9721 (8.30E-100)	0.5773
Special treatment	2.4509 (-0.8889) (-13.9436)**	3.7468 (0.4070) (8.3477)**	3.1565 (-0.1834) (-4.1403)**	4.005 (0.6652) (9.0988)**	307.5079 (2.40E-66)	0.5775
Convenience	3.4674 (-0.2610) (-3.6661)**	3.7401 (0.0118) (0.2284)	3.2449 (-0.4834) (-6.0158)**	4.461 (0.7327) (12.6052)**	160.7072 (1.30E-34)	0.3289

Table III.
Latent segments scores

Note: *,**Significant at 95 and 99 percent levels, respectively

the average value of the variables in each segment, whereas the estimated parameter variable represents the effect of the variable on the latent segment. Overall, the significant Wald statistic and R^2 coefficient indicate that there are significant differences in the position of each variable with respect to the four segments, indicative of the discriminatory ability of the criterion variables that characterize the relationship between the agency and its main supplier. Individually, the z -statistic associated with the estimation of each variable in each segment is significant, at 95 percent at least, indicating that relationship value and the benefits of the relationship (social, confidence and special treatment) significantly affect the formation of all latent segments. The variable intensity of ICT use and the benefit of convenience have a significant effect in three of the four groups identified. These results help to answer the first research question, as they confirm that the dimensions related to the relationship between the agency and its main supplier and ICT use discriminate agencies throughout the four latent segments in a significant way. However, the capacity of all these variables to form groups is different. Considering that relationship value and social benefits, special treatments and confidence are significant variables common to all groups at 99 percent, convenience was not significant in Group 2 whereas intensity of ICT use was not significant in group 4.

To respond to our second objective, we analyze the profile of each of the four segments according to the descriptive information introduced as covariables. They are general segmentation criteria such as business activity of agency and main supplier, length of patronage with main supplier, number of alternative suppliers and the percentage of purchases from the main supplier. Table IV shows the profiles of each latent class.

The results in Table IV indicate differences between the four groups in relation to the activity of the company and main supplier. In relation to agency activity, two segments only contain retailers and wholesale travel agencies (Groups 3 and 4), whereas one segment also

Active covariable	Categories	Aggregated	Seg 1	Seg 2	Seg 3	Seg 4
Activity	Retailer	88.5%	99.3%	89.4%	39.5%	95.2%
	Tour operator (wholesaler)	9.5%	0.0%	4.7%	60.5%	4.8%
	Transport supplier	0.7%	0.7%	1.2%	0.0%	0.0%
	Other services supplier	1.3%	0.0%	4.7%	0.0%	0.0%
$\chi^2(df) = 144.01 (9)** (p-value = 0.000)$						
Main supplier	Tour operator (wholesaler)	70.2%	72.9%	78.8%	28.9%	81.0%
	Transport supplier	15.1%	25.0%	1.2%	26.3%	0.0%
	Hotels	11.1%	2.1%	17.6%	42.1%	0.0%
	Other services supplier	3.6%	0.0%	2.4%	2.6%	19.0%
$\chi^2(df) = 124.54 (9)** (p-value = 0.000)$						
Length of patronage with the main supplier	Average value (Years)	11.54	14.49	7.73	13.58	7.64
$KW = 60.09** (p-value = 0.000)$						
Percentage of purchases from main supplier	Average value (%)	36.31	37.55	27.01	33.29	53.74
$KW = 83.40** (p-value = 0.000)$						
Number of alternative suppliers	Average value	14.85	15.11	8.53	21.24	20.98
$KW = 39.28** (p-value = 0.000)$						
Note: **Significant at 99 percent						

Table IV.
Latent segments profiles

cover suppliers of transport and other services (Group 2). There are also differences regarding the activity of the main supplier. Frequency distribution indicates that, despite the majority activity being that of wholesale agency or tour operator, there is a presence of transport suppliers in Segment 1 and hotel suppliers in Segment 3.

In relation to the other descriptive variables, the segment with the shortest duration in the relationship with the main supplier shows the highest percentage of sales (Segment 4) and an average number of alternative suppliers significantly higher than the other segments.

The composition of each latent class was analyzed on the basis of profile (Table III) and descriptive characteristics (Table IV). The first segment is the most numerous with 98 companies. These agencies give below average scores for relationship variables, especially intensity of ICT use in relation to their main supplier. This fact is evident in comparison with the fourth segment as it shows significantly lower scores for the value of the relationship and its social benefits. This segment mostly contains retailers (99.3 percent) who work mainly with tour operators (72.9 percent) with whom they maintain a significantly longer lasting relationship than Groups 2 and 4 (14.49 years on average).

The second group (84 agencies) gives high scores for relationship benefits, especially for the social benefits of the relationship with their main supplier. It is the only segment that groups agencies in the four activities. For that reason it is also characterized by the variety of activities of the main supplier. This group has the shortest times with the main supplier and a significantly lower number of alternative suppliers than the other segments.

The third segment (70 companies) is characterized by its positive evaluation of the intensity of ICT use in relations with their main supplier. However, this group of companies gives the lowest scores for the benefit of convenience. This can be seen from the fact that this group works with a higher than average number of other suppliers (21.24 on average). The group consists mainly of tour operators (60.5 percent) with a high percentage of hotels as main supplier (42.1 percent).

The fourth group (58 companies) is characterized by its high scores for the relationship value and almost all the benefits stemming from the relationship, and in particular confidence, convenience and special treatment. Like the third group, it is made up solely of retailer agencies and tour operators and in particular, retailer agencies (95.2 percent). It also stands out because of the number of main suppliers dedicated to other services (19 percent). Their high valuations of relationship benefits are evidenced by the high percentage of sales with their main supplier, although the average number of alternative suppliers they work with is also high.

5. Discussion and conclusions

This work highlights the need to study unobserved heterogeneity in interfirm relations taking into account the subjective characteristics of that cooperation. We use latent segmentation by estimating a finite mixtures model, following the proposal from Roberts *et al.* (2014), who point out the superiority of this methodological tool for decision making in marketing strategy.

The first aim of this study has been to examine the effectiveness of ICT use and other supplier relationship variables (relationship value, confidence, special treatment and social benefit, and convenience) as segmentation criteria in the B2B market. From the results of estimating the latent class model, we can obtain interesting conclusions that contribute to academic advancement and business management. First, companies value the variables concerning supplier relations and ICT use in B2B relations in different ways and these variables are able to discriminate firms into four segments. Therefore, at the global level there are significant differences in the valuation of each variable between these segments.

At individual level, the perception of relationship value and some of the benefits of that relationship for the travel agency (confidence, special treatment and social benefits) are the most relevant segmentation criteria because both these variables are able to discriminate the agencies into four groups. In contrast, the perception of intensity of ICT use and convenience are more limited as segmentation bases because they are only able to discriminate three segments. However, despite its lack of discriminatory power, we also would point out that convenience, together with confidence, has high average values in all the classes.

Intensity of ICT use is the worst valued variable in the relationship, only obtaining a high score in one of the segments made up mostly of tour operators (wholesalers). This finding suggests that despite the advantages of using ICT in the relationship as reported in recent studies (e.g. Berné *et al.*, 2015) the benefits of trust and convenience are much more relevant for successful relations among tourist companies.

Third, two segments profiles stand out above the rest: Segment 2 (84 agencies) and the least numerous (Segment 4: 58 agencies). Both groups attach great importance to relational benefits and above all to relationship value.

The second research question focused on profiling the resulting segments in order to describe relationship marketing strategies at segment level. This aim has been achieved with the number of objective variables that enable description of the resulting segments to make them more accessible. In this regard, the results indicate that the segment made up of agencies that do not have transport firms or hotels as main supplier, but tour operators with whom they make the highest percentage of sales (Segment 4), is the segment that attaches the highest value to the relationship and the resulting benefits. For their part, agencies that have mainly hotels as main suppliers attach the greatest value to intensity of ICT use in the relationship (Segment 3). In addition, travel retailers (Segment 1) give the lowest scores to relationship value and intensity of ICT use, despite being the companies with the longest lasting relationships with their main supplier. Finally, the group of agencies that includes those that have other service suppliers (Segment 2) value very positively the social benefits stemming from the relationship.

Therefore these results show the existence of heterogeneous groups of travel agencies in relation to variables concerning relations with their main supplier, such as relationship value and benefits, and ICT use. Since the segmentation methodology has revealed the ability of these criteria to discriminate tourism companies, our results help to build on the empirical evidence from previous studies that have identified the positive effect of relationship benefits on the perception of value (Ruiz-Molina *et al.*, 2015), and of value on confidence and long-term orientation (Gil *et al.*, 2011).

From the academic point of view, this research contributes to our understanding of the role that ICT and relationship variables have in the segmentation processes of tourism companies. Literature on segmentation in the B2B context is limited (see e.g. Rezaei and Ortt, 2013; Ruiz *et al.*, 2013; Rezaei *et al.*, 2015) and it is hard to find studies which apply latent methodology using behavioral criteria related to the use of ICT and relationship criteria. Therefore, the novelty of this study lies in the simultaneous use of these criteria to identify heterogeneous groups of companies from a latent class model.

This study has a series of limitations which provide important opportunities for future research. From the conceptual perspective, switching costs could also be considered as a basis for segmentation. The literature has identified switching costs as a factor that also contributes to the length of the relationship (Patterson and Smith, 2001). And furthermore, recent studies highlight the need to explore potential switching costs more deeply as barriers to breaking off the relationship and loyalty (e.g. Heirati *et al.*, 2016). Therefore it would be interesting in future works to incorporate switching costs in the segmentation process to measure their ability to discriminate groups of firms. In addition to costs, the suitability of

adding other segmentation criteria such as long-term orientation (Heirati *et al.*, 2016), commitment (Huo *et al.*, 2015) or psychographic variables could also be valued (Weinstein, 2014; Hohenschwert and Geiger, 2015).

In addition to improving the segmentation process by adding the study of other criteria, this line of research could be furthered by going deeper into the relationship between perception of ICT use and relationship variables. According to the study results, the groups that particularly value some relationship aspects (Segments 2 and 4) do not stand out for their evaluation of ICT use. Similarly the segment that values ICT highest does not show high levels of value and benefits (Segment 3). Therefore, it would be interesting to use other methodologies to investigate the type of contribution made by perception of ICT use to value and perceived benefits.

From the methodological point of view, the sample size limits the generalization of results to the population and each segment. The results could be improved by increasing sample size. Furthermore, we propose analyzing the study variables from the perspective of other travel agency employees. This work has only considered the point of view of company managers, and so finding out about the perception of other employees who are in contact with suppliers could offer a more complete view of the inter-organizational relationship. Similarly, the segmentation study could be extended to other tourism B2B contexts such as hotels, restaurants or transport companies. This approach would provide confirmation of whether the variables differ in their abilities to identify company segments.

6. Implications for business marketing practice

The current study reinforces the importance of segmentation in B2B context. These findings have important managerial implications and provide recommendations for tourism companies. From the point of view of business management, segmentation of the tourism organizational market based on valuations of supplier relations and ICT use can help suppliers to design or adapt differentiation marketing strategies.

Specifically, the use of ICT, value and relationship benefits enable a clear differentiation between groups of travel agencies. This segmentation has provided four groups with different valuations for these variables and different characteristics. Given that holiday firms do not assign the same importance to the use of technologies or different aspects of the relationship, service providers should adapt their strategies to the preferences of each type of segment. Therefore, from the description of these groups, a series of recommendations can be made for each of them directed at supplier companies to improve their relations with their customer agencies.

In the four segments it is possible to identify and label, first, three groups of retailer agencies whose main suppliers are tour operators (Segments 1, 2 and 4) and second, a fourth group formed by tour operators whose main supplier are hotels (Segment 3) (see Table V):

- (1) Long-term retailers (Segment 1): are the agencies which value ICT use, value and benefits least, and they only consider the benefits of convenience to be important. Despite that, they have the longest relationships with the supplier and so this type of agency shows loyalty linked more to efficiency, time and effort, stemming from that lasting relationship than to the personal or emotional part. Therefore it would be advisable for tour operators to offer more benefits focused on the service, mainly speed, to differentiate themselves from other services and competing offers and maintain and strengthen that relationship.
- (2) Social retailers (Segment 2): are the agencies that most value social benefits. Given that they make the lowest percentage of purchases and they have the smallest number of alternative suppliers, they show more attitudinal than behavioral loyalty.

Basis and characteristics		Segment 1 (<i>n</i> = 98) long-term retailers	Segment 2 (<i>n</i> = 84) social retailers	Segment 3 (<i>n</i> = 70) technologies tour operators	Segment 4 (<i>n</i> = 58) relationship retailers
Segmentation basis	ICT intensity	The lowest	Intermediate	The highest	Intermediate
	Relationship value	The lowest	Intermediate	Intermediate	The highest
Descriptive characteristics	Confidence benefits	The lowest	Intermediate	Intermediate	The highest
	Social benefits	The lowest	The highest	Intermediate	Intermediate
	Special treatment	The lowest	Intermediate	Intermediate	The highest
	Convenience	Intermediate	Intermediate	The lowest	The highest
	Activity	Retailers predominate	Retailers predominate	Tour operators predominate	Retailers predominate
	Main supplier	Tour operators predominate	Tour operators predominate	Hotels predominate	Tour operators predominate
	Length of patronage with the main supplier	The longest relationship	Intermediate	Intermediate	The shortest relationship
Percentage of purchases from main supplier	Intermediate	The lowest %	Intermediate	The highest %	
No. of alternative suppliers	Intermediate	The lowest no.	The highest no.	Intermediate	

Table V.
Summary of the four segments characteristics

In this case, tour operators should focus their efforts on including personal relations between their employees and their clients as that could increase the percentage of sales and reduce the risk of switching to other suppliers.

- (3) Relationship retailers (Segment 4): are the agencies that attach the most importance to value and benefits, especially those of confidence, special treatment and convenience. These agencies have the shortest relationship with the supplier and make the highest number of purchases. To maintain this behavioral loyalty and achieve greater emotional loyalty, the task of tour operators should involve improving both the services and personal relations with customer agencies. This approach would enable increased perception of value and benefits, both tangible (e.g. economic incentives, reduced waiting time, growing the number of contacts, referential services, service customization, etc.) and intangible (e.g. greater commitment and sincerity, affective links, reduced customer anxiety and perceived transactional risk, etc.). Given that this segment is more sensitive to aspects surrounding the relationship with the supplier, developing these actions should be oriented toward increasing the intensity and number of relations. On this issue, the literature highlights that improving and developing relations in the tourism distribution channel is a strategic tool for improving market position and profitability (Berné *et al.*, 2015).
- (4) Technologies tour operators (Segment 3): these are tour operator agencies which are customers above all of hotels, and they particularly value ICT use and attach little importance to the benefits of convenience. In addition, this group has the highest number of alternative suppliers. Therefore in this case, hotels should make efforts to improve technologies incorporating applications with significant advantages in terms of efficiency and which consequently enable an increase in the benefits these agencies perceive in the relationship. In addition, hotels should be aware that

these actions must not ignore the personal and social relations also valued by this type of agency and so ICT use must be approached carefully to avoid depersonalizing the service. The importance of ICT in improving relations in the distribution channel has been widely recognized in the literature on tourism (e.g. Breidbach and Maglio, 2016). In this line, some recent studies confirm that relations between tourism firms based on ICT have more effect on business performance than other relationship elements (Berné *et al.*, 2015).

In this work, ICT, the value and benefits of the relationship have been shown to be useful segmentation criteria for analyzing the B2B tourism market. From the supplier's perspective, identification of statistically heterogeneous groups formed by tourism companies with the same perception of ICT and of the relationship highlights the importance, first, of appropriately selecting the segment(s) according to the supplier's objectives and resources and second, designing strategies tailored to the particular features of each segment. Developing technologies and improving perception of value and benefits should not be done indiscriminately but considering that client companies want and value different aspects so that relations with their suppliers can contribute to success in the form of benefits, performance and competitiveness.

From the client company perspective, however, it would be important to study whether these segmentation criteria can be used as criteria for selecting suppliers. If suppliers tailor their strategies according to the importance firms attach to ICT and the relationship, it can be assumed that those companies will consider those same elements particularly important when evaluating and choosing their service suppliers. This issue could be one for practitioners to consider. The usefulness of segmentation at practical level must be contemplated from both perspectives (supplier and customer) that is, to what extent these segmentation criteria used by suppliers coincide with the selection criteria used by customers.

Note

1. SABI database is generated by the private firm INFORMA and it contains financial and economic information on major Spanish and Portuguese firms from 1990. The largest travel agencies were selected in terms of total assets on the company's balance sheet in each activity according to their NACE (National Classification of Economic Activities) and TEA (Tax on Economic Activities) codes. In particular, we consider retail travel agencies in the three largest Spanish cities in terms of population, i.e. Madrid, Barcelona and Valencia, and one of the main tourism destinations, i.e. Alicante.

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