Cluster and Firm-Specific Antecedents of Organisational Innovation[1]

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Abstract: Based on the idea of the tourist destination as a cluster, this paper proposes a model to explain the relationships between exploration and exploitation capabilities – whether originating in the cluster or firm-specific – and a firm's organisational innovation. This study turns to the resource-based view to provide a theory-based concept of shared capabilities accumulated in a tourist destination or cluster, together with valid measurement instruments to capture them. Our conceptual model highlights the theoretical and practical benefits for firms of being embedded in a cluster to develop both exploration and exploitation capabilities. The study also analyses the interaction between cluster-shared capabilities and firm-specific capabilities in exploration and exploitation to obtain two types of firm organisational innovation: radical and incremental. Some implications for managers and policy-makers are presented, highlighting the importance of tight integration in managing firm and cluster resources and capabilities.

Keywords: Exploration capabilities; exploitation capabilities; shared capabilities; clusters; radical innovation; incremental innovation

Introduction

Innovation is particularly important in the tourism industry, and it has emerged as a crucial force for the competitive position of firms in the sector and also for the level of wealth in destinations (Hall & Williams, 2008; Hjalager, 2010). Previous tourism studies posit organisational innovations as the predominant type of innovation in the sector (e.g., Camisón & Monfort-Mir, 2012; Jacob, Tintoré, Aguiló, Bravo, & Mulet, 2003; Rodríguez, Williams, & Hall, 2014). However, technological innovations, particularly those based on Information and Communication Technologies (ICTs), are taking on an increasing role as determinants of how competitive tourism organisations and destinations are (Buhalis & Law, 2008; Racherla, Hu & Hyun, 2008). The tourism sector has been heavily affected by the new e-business models, and by the change in the way processes are configured and decisions taken, based on the collection, process and dissemination of information and knowledge. As service companies, the success of tourism organisations depends on good management of their customers, which in turn obliges them to build links with suppliers and with the new virtual distributors that are appearing on the scene. Yet despite their importance, little research has been carried out on the antecedents and determinants of tourism firms' adopting organisational innovations. The present study aims to further the research line that redresses this shortcoming.

Moreover, according to Schumpeter (1934) innovation can be classified as incremental or radical depending on the degree of newness and departure from existing practices. A further bias in innovation research in the tourism sector is the predominance of incremental innovations. However, various studies point to the importance of radical innovation in guaranteeing tourism firms' long-term sustainability in an increasingly globalised, dynamic and competitive tourism market (Sørensen, 2007; Martínez-Ros & Orfila-Sintes, 2009). In light of these findings, this study considers both types of innovations

as necessary and complementary to tourism firms' competitiveness (Martínez-Ros & Orfila-Sintes, 2009).

To analyse firm innovation it is necessary to study its antecedents since they are rooted in the early phase of the process (Brown & Eisenhardt, 1995) in which firms search for new ideas and develop knowledge by looking within and beyond their own boundaries. As for external determinants, the concentration of activities in a tourist destination or cluster may facilitate knowledge acquisition and integration of external knowledge, leading in turn to greater innovation (Novelli, Schmitz, & Spencer, 2006; Sainaghi, 2006; Weidenfeld, Butler, & Williams, 2011). Clusters are also crucial for the tourism sector to alleviate the market inefficiencies related to the atomised SMEs that characterise the sector (Perles-Ribes, Rodríguez-Sánchez, & Ramón-Rodríguez, 2015).

Despite the growing body of literature analysing the implications of clusters in the tourism sector (e.g., Hall, 2005; Michael et al., 2006; Nordin, 2003; Novelli, Schmitz, & Spencer, 2006), there is still a considerable gap in comparison with the analysis of industrial clusters (Nordin, 2003; Novelli et al., 2006). The literature has, over time, defined the concept of 'destination' as both a system of attractions and the geographic area that encompasses them, identified on the basis of the range of needs of intermediate or final clients (Sainaghi, 2006). This has given rise to ambiguity surrounding the term destination, which in some cases could be a resort or a cluster, a region, a country, or even a continent (Sainaghi, 2006, p. 1054).

This study adopts a concept of the tourist destination in which the concentration of firms in defined geographic areas takes on a much deeper meaning than that derived from spatial coexistence. The tourism destination constitutes the central element of a model with competitive advantages generated by the exploitation of certain economic advantages known as external economies (Zeitlin, 1992).

Hjalager (2000) applies the concept of industrial districts to tourism destinations to provide a better understanding of their success factors. Economic analysis of the tourist destination as a tourism district (Aurioles, Fernández & Manzanera, 2008; March & Wilkinson, 2009; Saxena, 2005) or cluster (Novelli, Schmitz, & Spencer, 2006; Schianetz, Kavanagh, & Lockington, 2007; Weidenfeld, Williams, & Butler, 2010) has expanded to include new details about the specific social system – as a confluence of agents, initiatives and experiences – that flourishes within the geographic boundaries it is surrounded by (e.g., Becattini, 1990). Linking competitiveness with the density of the tourism network in a certain territory underscores the extent to which the innovative capability of a firm competing in the final market is conditioned by the shared capabilities available in the destination. The strategic perspective of industrial clusters highlights shared capabilities in the form of knowledge assets and information deposited in the geographic area close to the firm (Saxena, 2005); flows of knowledge, information and experiences that circulate within the cluster with a certain degree of freedom; the existence of a common positioning; or the entrenched culture, values and vision in the territory (Saxena, 2005). Recent dynamic approaches such as the resource-based view (RBV) and the dynamic capabilities approach emphasise clusters as venues of knowledge creation through interactions among cluster firms and institutions (Lorenzen & Maskell, 2004; Saxena, 2005; Novelli et al., 2006). This is the perspective we adopt in this study. Other recent studies also apply the concept of tourist districts in the same way (Marco-Lajara et al., 2014).

Furthermore, exploration and exploitation have been proposed as fundamental activities in the study of the roots of firms' competitive advantage and innovation, (Atuahene-Gima, 2005; He & Wong, 2004; Gupta, Smith, & Shalley, 2006; March, 1991; Rothaermel & Deeds, 2004). Although their different nature demands differentiated processes, facilitators and even structures (He & Wong, 2004) to evolve, and even to survive, firms must develop

both capabilities (Tushman & O'Reilly, 1996). The study of both capabilities has received increasing attention in management research (e.g., Benner & Tushman, 2003; Gupta et al., 2006; Levinthal & March, 1993; March, 1991; Yang, Zheng, & Zhao, 2014) due to their importance for achieving innovation. Although few studies specifically distinguish between exploration and exploitation in the tourism sector (see Tang, 2014 as an exception), the importance of innovation in tourism firms calls for the analysis of both capabilities. Following Atuahene-Gima's (2005) definition, and consistent with March's conceptualisation (March, 1991), in this study we consider exploration as the capability to develop new knowledge, skills and processes, and exploitation as the capability to refine and extend existing knowledge (Atuahene-Gima, 2005). Some authors also analyse the two concepts at other levels, for example at the individual level (e.g., Mom, Van Den Bosch, & Volberda, 2009), or at the alliance level (e.g., Rothaermel & Deeds, 2004; Yang et al., 2014) but the distinction between exploration and exploitation in the context of cluster-shared capabilities is still scarce.

In this vein, the present study aims to capture the multi-level nature and relationships between capabilities in knowledge exploration and exploitation underlying incremental and radical organisational innovation in tourism firms (Camisón & Monfort-Mir, 2012; Orfila-Sintes, Crespí-Caldera, & Martínez-Ros, 2005) by differentiating between the innovation capabilities the tourism firm possesses and the benefits it may receive from shared capabilities located in the tourist cluster.

Our first contribution is to provide a theory-based concept of shared capabilities accumulated in a tourist destination or cluster, differentiated from firm-specific, knowledge-based capabilities, together with valid measurement instruments to capture them. Specifically, this study distinguishes two components of shared capabilities that, although complementary, play different organisational roles in the exploration and exploitation of knowledge. Our study

is thus among the first to conceptualise and empirically measure shared capabilities by developing and validating multi-item measurement scales, while tapping into the constructs of shared capabilities in exploration and shared capabilities in exploitation.

Second, our conceptual model highlights the theoretical and practical benefits of being embedded in a cluster to develop both exploration and exploitation capabilities. Third, the study aims to analyse the relationships between cluster-shared capabilities and firm-specific capabilities in exploration and exploitation to obtain two types of organisational innovation: radical and incremental innovation. The literature either assumes a relationship between exploration and radical innovation and between exploitation and incremental innovation, or directly classifies innovations as explorative or exploitative, arguing that the former are radical innovations and the latter incremental innovations (e.g., Jansen, Van Den Bosch, & Volberda, 2006). Nevertheless, with a few exceptions (e.g., Atuahene-Gima, 2005; Faems, Van Looy, & Debackere, 2005) these relationships have not been tested. Our research predicts innovation asymmetries, in both radical and incremental innovation, between firms within the same tourist cluster derived from their varying patterns of appropriation of shared capabilities (Arikan, 2009; Camisón, 2004), which are in turn connected with their heterogeneous firm-specific capabilities.

Theoretical Framework

Firm-Specific Exploration and Exploration Capabilities

The evolution of knowledge and learning is essential for organisations to successfully compete in the development of innovations (Cohen & Levinthal, 1990). To achieve innovation, organisations must exploit existing capabilities and renovate them to avoid the rigidities they can produce (Leonard-Barton, 1992). Both exploration and exploitation capabilities are necessary to the evolution of learning and to the competitiveness of firms

(March, 1991).

The analysis of what exploration and exploitation means, together with their antecedents and consequences, has expanded in the organisational learning literature since March's (1991) seminal contribution. His analysis is consistent with the resource-based view and its dynamic extensions such as the dynamic capabilities approach (Teece, Pisano, & Shuen, 1997), as dynamic capabilities are grounded in learning processes (Henderson & Cockburn, 1994) for knowledge integration, building and reconfiguration (Teece et al., 1997; Verona & Ravasi, 2003), through exploration and exploitation (Benner & Tushman, 2003).

According to March (1991), the evolution of organisational learning is rooted in exploration through search, risk taking, discovery, experimentation and flexibility, and also in the exploitation of what is already known through activities related to refinement, production, execution, implementation and efficiency. The aim of exploration is to develop new knowledge, while exploitation involves refining existing knowledge (Atuahene-Gima, 2005; Levinthal & March, 1993). The benefits of exploration are seen in the long term because of its focus on experimentation, whereas exploitation produces more short-term gains by improving quality and efficiency (Benner & Tushman, 2003), and both are necessary to the evolution of knowledge and learning for success in guaranteeing the firm a sustainable competitive position (Levinthal & March, 1993; March, 1991). The present study adopts this perspective as it is grounded on Atuahene-Gima's (2005) definition and measurement. Although Atuahene-Gima (2005) links his definitions with their influence on product innovation, the conceptualisation also fits with a broad understanding of the product that includes in its definition both product and service, since March's definition (March, 1991) associates both terms with the evolution of learning, and not specifically with this particular type of innovation.

Shared Capabilities of Tourist Clusters

Knowledge not only resides in individuals and organisations, but is also found in specific local systems like networks and clusters. The canonical definition of industrial clusters includes certain characteristics and conditions that if strictly adhered to will clearly exclude many other local production systems, including tourist destinations. However, Sainaghi (2006:1054) states that the concept of the tourism cluster can also include elements of a cluster according to the canonical or Marshallian approach which have been considered as advantageous for the firms located within it. These elements are: a well-defined geographical area with a high concentration of small and medium-sized enterprises specialising in some related or complementary activities in the value chain; access to qualified labour, knowledge and new ideas; existence of cooperation structures, supportive public policies and services; a shared culture and vision; and the stimulus of innovation.

The cluster's knowledge and skills are deposited in what are known as shared capabilities. Shared capabilities are understood as "all intangible, higher-order resources and capacities" by Foss (1996); as a context of opportunities and restrictions generating superior order capabilities by Foss and Eriksen (1995); and as a higher-order knowledge base shared by firms located in a cluster by Lorenzen (ed., 1998, p. 143).

Intra-cluster shared capabilities are a measure of the structural attractiveness of the knowledge spillovers accessible to intra-cluster firms. The importance of shared capabilities as a source of advantage over competitors that cannot access them derives precisely from their intangible, tacit nature. Implicit in the conceptualisation of these shared capabilities is the idea that co-location per se is not enough to guarantee knowledge transfer between firms, and what matters is being connected to the local community and engaged in the implementation of specific policies and learning activities.

Previous studies have identified different cluster typologies (e.g., John & Pouder, 2006). Recent research suggests that the characteristics which give rise to these typologies can be present in the same type of network or cluster (Ferrary, 2011), referred to as ambidextrous clusters because of their combination of shared capabilities in both exploration and exploitation. Our proposal draws on previous studies such as Pinch, Henry, Jenkins and Tallman (2003) that, following from the work of Henderson and Clark (1990), explicitly recognise the existence of cluster-specific component knowledge and cluster-specific architectural knowledge. These authors define component knowledge as normally being tied to the technology and operating norms of particular industrial sectors or clusters, and is often codifiable and transferable to all of their members. In contrast to component knowledge, architectural knowledge tends to be specific to, or embedded in, a particular system within which it evolves endogenously over time, making it difficult to transfer between organisations. Furthermore, architectural knowledge is typically intangible and tacit in nature. It is also usually tied to capabilities that involve cooperation between multiple agents dispersed in the system.

Following these previous studies, we distinguish two types of shared capabilities: shared capabilities in exploitation and shared capabilities in exploration. Shared capabilities in exploitation encompass cluster-specific component knowledge (Pinch et al., 2003), whereas shared capabilities in exploration include cluster-level architectural knowledge.

Shared capabilities in exploitation include the presence of a mission and strategy shared by intra-cluster companies that can be differentiated from those of competitors outside the cluster. The shared vision stems from a feeling of identity and common future, which drives organisations from the same cluster to design a strategic plan for the cluster. These capabilities also include a framework to showcase the cluster's product through the efforts of local institutions or through cooperation with distributors, groups of competitors, or business

associations in the area. Finally, this construct integrates the existence within the cluster of a pattern of cooperative relationships with customers, suppliers, subcontractors, and financial institutions, which facilitates complementarity, maximum joint efficiency and refinement. Shared capabilities in exploitation integrate knowledge and practices in technological and knowledge-proximate domains.

Shared capabilities in exploration reflect the presence of flows of creation and dissemination of knowledge and information that is new to intra-cluster firms. This type of shared asset is found in four sources: a) relationships and cooperation with customers, suppliers, competitors, subcontractors, R&D organisations, experts and consultant firms; b) the flow of information about products, processes, technologies, customers and markets that circulates informally inside the system; c) the existence of local institutions providing research services and support to establish cooperation agreements for intra-cluster companies; and d) the existence of learning processes for companies in the tourist destination from the sharing and joint development of experiences, which contribute to defining a collective learning curve. These common learning processes derive from: the processes of cross-pollination favoured by the movement of employees between intra-cluster companies, transmitting the tacit knowledge they have accumulated, and through the sharing of knowledge in collective forums; and intra-cluster benchmarking. Shared capabilities in exploration imply a firm's absorption of knowledge and technology in different domains. Therefore, this type of shared capabilities involves firms' variation, experimentation, risk taking and discovery.

The distinction made between these two types of shared capabilities is manifested in the technological distance between intra-cluster firms' existing knowledge and the domains of knowledge in which they search. Shared exploitation capabilities build on creating a common identity, shared vision, and collective reputation through joint cognitive and normative

schemas, and sometimes by devising a common strategic plan. These shared exploitation capabilities enable efficient production structures with the value system.

Shared capabilities in exploration gather the flows of dissemination of knowledge and technologies that defines a cluster's collective learning curve. These capabilities derive from the cluster members' active cooperation and interaction over time, on the basis of the 'rules of the game' established by shared capabilities in exploitation. Hence, shared exploration capabilities gather stocks and flows of knowledge subject to discovery and creation rather than redefining by organisations. Unlike the shared competences in exploration, knowledge embedded in shared competences in exploitation is potentially easily transferable among intra-cluster firms, which is to say that they are likely to be aware of that knowledge and that they will find it understandable once it is presented to them. Shared capabilities in exploration are necessary for adapting and applying shared competences in exploitation for creative use.

Radical and Incremental Innovation

Innovation in the tourism sector is determined by the specific characteristics of producing and marketing tourism products. Some of the most important of these are (Weiermair, 2006; Gallouj & Winstein, 1997; Orfila-Sintes et al., 2005): (1) production and consumption happen at the same time, so products cannot be stored; (2) tourism products embrace interrelated tangible and intangible elements; (3) the consumption of tourism products involves the active participation of the customer; (4) producing and marketing may involve large capital assets (airlines, hotel chains, etc.); (5) many different service suppliers participate in creating a tourism product; (6) the capability and motivation of human resources are essential, and (7) competition is not only between firms in one geographic destination, but also between firms from different destinations. The importance of intangible assets stresses the requirements of the organisation to both introduce proactive radical changes and constantly redefine and

efficiently manage them. In this context, both organisational and process innovations are core to the efficiency and productivity required by dynamic tourist organisations that aim to outperform their competitors and maintain their long-term benefit (Camisón & Monfort-Mir, 2012; Rodríguez et al., 2014). Organisational innovation is defined as the introduction of new organisational methods for business management in the workplace and/or in the relationship between a company and external agents (OECD, 2005). Process innovations represent significant changes in production and delivery methods (OECD, 2005).

Due to the intangibility and the importance of information in services, ICTs lie behind most organisational innovations and process innovation, impacting the way tourism organisations manage and compete (Buhalis & Law, 2008; Orfila-Sintes et al., 2005; Racherla, Hu & Hyun, 2008). In the same way, innovations in ICTs need to be complemented by changes in order to make sense in organisations as new work or business processes, structures and new forms of cognition (Lyytinen & Rose, 2003). Therefore, the link between organisational and technical innovation makes innovation processes in the service sector a more comprehensive and complex approach and multidimensional phenomenon (Den Hertog, Gallouj, & Segers, 2011), and also explains the low official rates of technological innovation in this industry due to the great number of "hidden" technological innovations that underlie organisational innovations (Camisón & Monfort-Mir, 2012). Most technological innovations have propelled a wide range of changes in the firm's organisation, strategy and structure. Furthermore, new organisational methods are introduced and implemented through new ICTs, such as new software and databases that improve the diffusion of information and thus the distribution of responsibilities and decision making among employees, the structuring of activities, and new ways of organising relationships with other firms or public institutions, such as collaboration with customers and suppliers.

This study also distinguishes between radical and incremental innovation according to three criteria: i) the cost of the change: ICTs are classified as radical if they incorporate a technology that is clearly differentiated from existing practice and involves a higher cost (Ettlie, Bridges, & O'Keefe, 1984); ii) the degree of new knowledge in relation to risk: ICT-based innovations are considered to be radical if they represent modifications that are clearly differentiated from current practice in terms of the new knowledge they incorporate (Dewar & Dutton, 1986); iii) repercussions on the firm's structure, processes and activities: innovations are considered radical if they entail fundamental changes to the configuration and practices of the way work is organised and the service provided (Damanpour, 1991).

Radical organisational innovations imply tourism firms' **adding new external and internal knowledge** through their information management systems. Specifically, the implementation of relational databases (CRM) allows them to truly understand customer preferences and needs, and be proactive in their design of products to stand out from their competitors. This prospective tool also encourages customer fidelity. The introduction of enterprise resource planning software is also crucial to obtain new products and processes, as it allows the integration of relationships with suppliers, who predominate in the introduction of technological innovations in tourism (Evangelista & Savona, 2003; Sørensen, 2007). On the other hand, radical organisational innovation involves changing the design of processes. This can be done by introducing tools and systems for knowledge management (Shaw & Williams, 2009) and for workflow, which will allow the transfer and implementation of innovative ideas from employees (Nieves, Quintana, & Osorio, 2014; Orfila-Sintes & Mattson, 2009). Finally, radical organisational innovation involves **changing the way the service is provided** through investment in industrial automation and environmental sustainability (e.g. advance surveillance and security technologies, intelligent storage

chambers, kitchens with energy efficient control, sustainable buildings, etc.). In summary, radical organisational innovation introduces new practices and ways of organising processes.

In contrast, incremental organisational innovations combine a series of communication tools and basic management software to deal with transactional aspects of relationships with customers (e.g. accountancy) and suppliers (e.g. efficient management of purchases). That is, they cover a range of tools for **managing routine tasks** concerning relationships with customers and suppliers. Unlike radical innovation, incremental innovation does not involve breaking away from the traditional ways of organising certain business processes, but rather works towards their continual improvement.

Hypotheses: Background and Development

Shared Capabilities in Exploitation and Firms' Internal Capabilities

The presence of a common **strategic plan** driven by local agencies and other public institutions provides intra-cluster firms with more opportunities to implement restructuring strategies to reposition the destination as a whole by defining and shaping their image (Haugland, Ness, Grønseth, & Aarstad, 2011). Prompted by this common strategy, intra-cluster firms can adopt new practices to improve existing processes and routines (exploitation capabilities).

External communication activities carried out by tourism administration organisations and other institutions in the area can also be an important stimulus for firms in developing initiatives to improve their image, as well as their underlying resources, capabilities and products (Haugland et al., 2011; Sainaghi, 2006; Saxena, 2005). The most traditional of these activities is the marketing of a destination (selection of target markets, promotional efforts, participation in tourism fairs, attention to product development, pricing policies, distribution channels). Other activities include efforts to enhance the quality of

service experiences (Molina-Azorín, Pereira-Moliner, & Claver-Cortés, 2010) and the development of information systems to monitor new trends in sales, visitors' needs and supply innovations that ensure effective and efficient product development (Molina-Azorín et al., 2010). The role of public institutions in promoting and disseminating ICT applications to make marketing and promotion processes efficient (Buhalis, 1998; Chin, Haddock-Fraser, & Hampton, 2015; Mei, Arcodia, & Ruhanen, 2015) is particularly noteworthy. These processes are essential for smaller firms that do not have adequate financial resources (Chin et al., 2015; Sainaghi, 2006; Zach, 2013). In order to benefit from the destination's joint communication initiatives and avoid being left out of the improvements they can offer, firms can upgrade the current knowledge and skills they have in familiar products and technologies and even absorb new technologies and skills that are entirely new to them.

Creating a differentiated **integrated tourism product** also plays a major role in the international competitiveness of tourism firms (Smith, 1994). The tourism product is a conglomerate of tangible and intangible elements. From this perspective, the competitiveness of firms in a destination derives from the extent to which the integrated tourism product offered by all the firms located there, with complementary activities and products (such as accommodation, transport and catering), includes the attributes tourists-consumers most value in their purchasing decision (Wang & Fesenmaier, 2007). This means that within the destination, individual efforts to develop new and better products must be combined with coordination and pooling of the advances achieved, in pursuit of the complementarities and synergies among the agents that make up the cluster (March & Wilkinson, 2009; Perles-Ribes et al., 2015).

The information the firm can obtain from agents in its **value system** (specialised and other suppliers, distributors, etc.) is also essential for improving, customising, and even developing new products and processes (Belussi & Pilotti, 2002; Hjalager, 2010; Perles-Ribes

et al., 2014) and for guaranteeing their market success (Ordanini & Parasuraman, 2011). These agents can provide the firm with information about the market as well as new equipment and technology that enhance production and management efficiency (Novelli et al., 2006; Orfila-Sintes et al., 2005). The integration of the firm in a value system also provides access to favourable financing conditions (Camisón, 2004; Mei et al., 2015). The restaurant sector is a good example of the impact of the relationships among members of the supply chain. Advances in the food industry with the massive development in pre-cooked food and semi-manufactured products have allowed restaurants to incorporate new, more flexible, reliable and efficient management practices. Interaction with customers may also lead to improvements in the practical utility and user-friendliness of products. In light of the above arguments, we put forward the following hypothesis:

Hypothesis 1. Shared capabilities *in exploitation have a positive influence on firms' exploitation capabilities.*

There are beneficial effects of deepening the knowledge base and developing routines that work well within a particular field. However, destinations based on exploitation run the risk of getting locked in if external events render the knowledge base obsolete and the dominant routines dysfunctional. Institutions can play a dual role by providing individuals with incentives to experiment with 'new combinations' of existing knowledge and even the creation of new knowledge. Fostering a climate of trust among the agents in a tourist destination increases the number of face-to-face links (Saxena, 2005; Tsai & Ghoshal, 1998;), their strength or degree of closeness (Brown & Konrad, 2001), and the repetition of interactions (Maskell & Malmberg, 1999; Triglia, 2001). The promotion of interactions between sources of knowledge reduces the risks of opportunistic behaviour and its related monitoring costs, and the 'cognitive distance' and search costs. These characteristics are

expected to nurture the growth of the cluster, promoting tacit knowledge exchange among a diverse set of localised agents (Chin et al., 2015).

Moreover, although shared capabilities in exploitation cannot have a direct impact on the creation of radical innovations – this knowledge, while new to the firm, is related to existing routines in the destination – the ease with which it can be acquired, assimilated and combined (Cohen & Levinthal, 1990) with the firm's existing idiosyncratic knowledge can lead to new capabilities of exploration. Thus, the creation of a climate of trust and a common language offers local actors the possibility of benefiting from both 'Marshallian externalities' (exploitation of the same technological trajectory) and 'Jacobian externalities' (exploration of new combinations).

As we argued in Hypothesis 1, the presence of an **overall strategic plan** and policies to improve the tourist destination through the creative combination of unique resources (monuments, landscape, local culture and folklore, and so on) makes it easier for firms to participate in the development of radical restructuring and repositioning of the destination, which allows them to acquire entirely new technologies, skills and management practices (Denicolai, Cioccarelli, & Zucchella, 2010); that is, to implement a new business model. **External marketing and promotional efforts** by public agents and institutions can also compel firms to improve their product portfolio in order to keep up with their competitors and take full advantage of the benefits to be gained from differentiation initiatives.

Public institutions also play a crucial role in the development of a competitive **integrated tourism product**. They foster the creation of a common language to facilitate exchange and the combination of capabilities, and the elaboration of a shared business vision. When there is a certain **complementarity** and interdependence between the firm and the agents that comprise its value system, the firm is able to anticipate innovations in business models. In other words, firms can learn new skills and processes to design and launch new

products/services to the market (Tsai, 2009), reducing the risks and lead times in product development, and enhancing flexibility and market adaptability. Moreover, members of the supply chain or value constellation offer comprehensive new materials and equipment, and also new managerial systems and operational methods. Arikan (2009) also argues that cluster firms are more likely to make their knowledge available to others when commercialisation does not threaten their competitive position.

Our second hypothesis is therefore:

Hypothesis 2. Shared capabilities *in exploitation have a positive influence on firms' exploration capabilities.*

Shared Capabilities in Exploration and Firms' Internal Capabilities

The creation of new knowledge is crucial for coping with disruptive changes imposed by technological progress and globalisation. The evolutionary approach to spatial clustering directs attention to the mechanisms by which destinations emerge and avoids the path dependency, inertia and over-specialisation implied by the refinement, development and transformation of their specific routines.

In contrast to the canonical view, the evolutionary approach considers the cluster as a collective R&D laboratory, open to the development of the new shared mental and organisational models, to learning and experimentation (Maskell & Malmberg, 1999) in which innovation continuously flourishes (Camisón, 2004), or venues of enhanced knowledge creation (Lorenzen & Maskell, 2004; Malmberg & Maskell, 2002).

The relationships of competition and fierce rivalry between firms, explained by their physical proximity and the similarity of the goods and products they offer, stimulate the continuous internal generation of knowledge and new technologies in firms striving to hold onto their competitive advantage in the market. Thus, firms that want to keep their competitive position in the cluster and take maximum advantage of the knowledge

opportunities in their environment must also work to broaden the scope of their knowledge base and develop new routines and structures and a culture that fosters exploration.

Close cooperation with suppliers, subcontractors, customers and support institutions in the tourist destination can enable firms to acquire complementary, but radically new, knowledge (e.g., a theme park and a hotel company may cooperate in this way). Specifically, Ordanini and Parasuraman (2011) empirically demonstrate that when the focal firm collaborates with business partners in the service innovation process, the potential for radical changes is likely to be higher. By working as cross-border teams cluster members have a better chance of engaging in more face-to-face interactions, and of observing each other's behaviours, imitating each other and learning by doing things together (Perles-Ribes et al., 2015). These interactions can also promote creative solutions for the firm by providing varieties of thinking directions; that is, interactions allow "inbound open innovation", leveraging the discoveries of others (Denicolai et al., 2010). The presence of a climate of trust and cooperation also encourages the development of both multiple formal and informal transmissions of technologies and tacit knowledge (Chin et al., 2015; Weidenfeld et al., 2010), in a complex mix of cooperation and coopetition (Saxenian, 1994).

Institutions, professional associations and research institutes also play a fundamental role in providing information about both technologies and markets (Howells, 2006; Mei et al., 2015). These agents can pass on information about partners' specific knowledge and technological, scientific and managerial capabilities (know-what) to help actors in the district identify which organisations have certain capabilities and where they can be found (Howells, 2006). They also provide training courses to develop critical knowledge and skills, which is crucial for innovation (Hall & Williams, 2008). For example, information on new safety and health advances from research institutions spreads rapidly at fairs and conventions. The

introduction of new standards and methods can lead to the adoption of new systems and programmes that bring about important structural changes.

Local institutions not only play a fundamental role in developing local ties – buzz – with local partners, but also global networks – pipelines – outside the cluster (Malmberg & Maskell, 2002). These agents thus increase intra-cluster collective innovative capability and help counteract technological 'lock-in' within regional clusters of firms (Eisingerich, Bell, & Tracey, 2010; Giuliani & Bell, 2005).

In light of the above insights, our third hypothesis is:

H3. Shared capabilities in exploration have a positive influence on firms' exploration capabilities.

The existence of a set of shared capabilities in the destination firm's environment will not in itself be sufficient to ensure that it internalises them satisfactorily. Shared capabilities in exploration refer to new capabilities and knowledge not linked to previous routines and cognitive structures in the firm. Thus the identification, acquisition, and above all, implementation of new external knowledge are by no means simple processes (Veugelers, 1997), nor are they cost free (Harabi, 1995). Consequently, if firms want to capitalise on new external knowledge and apply it to refine, extend, leverage and recombine existing practices and knowledge about products, processes and methods, they should develop their internal explorative capabilities (Storey & Kahn, 2010). Explorative capabilities encompass internal knowledge creation and external knowledge absorption processes, both of which are needed to acquire, assimilate, transform and apply (Zahra & George, 2002) new external knowledge to commercial ends (Cohen & Levinthal, 1990).

The application of new external knowledge may thus require new complementary knowledge to which the firm may not have immediate or cost effective access. Without this previous related knowledge base, intra-cluster firms will not be able to identify the

innovativeness potential of external knowledge for creating competitive advantages and may even be unaware of the existence of the cooperative knowledge networks (Tsai, 2009). Valentina and Passiante's (2009) study on small- and medium-sized tourism organisations has also signalled the importance to innovation of absorptive capacity investment to benefit from participation in formal networks.

The cumulative and path dependent process of capability accumulation is therefore highly specific to each firm, so that even if firms operate in the same macro environment and industry over the same period of time, they may end up with different levels of technological capabilities (Camisón & Forés, 2011). Giuliani and Bell (2005) also find that knowledge is not diffused evenly 'in the air' but instead flows within a core group of firms characterised by their advanced absorptive capabilities. According to these authors, firms with higher absorptive capabilities are more likely to establish linkages with both intra- and extra-cluster agents.

In light of the above, we can state that firms must have exploration capabilities in order to assimilate and integrate new external knowledge with their existing knowledge base and apply it to extend and refine existing products, operations and practices. Therefore, our fourth hypothesis is as follows:

H4. Shared capabilities in exploration have an indirect positive influence on firms' exploitation capabilities *through the mediating effect of exploration capabilities.*

Firms' Internal Capabilities and Innovation

Radical innovation is built on new technologies and needs the integration of different knowledge bases (Wuyts, Dutta, & Stremersch, 2004) in which exploration capability is embedded. Exploration focuses mainly on creating variety, on risk and experimentation, which in turn should result in radical changes (Atuahene-Gima, 2005). Exploration capabilities expand a firm's knowledge base, encourage departure from current skills (Benner

& Tushman, 2003; Levinthal & March, 1993; March, 1991), and produce products or processes that differ from existing ones (March, 1991). In the ambidexterity literature (Tushman & O'Reilly 1996; He & Wong, 2004; Gibson & Birkinshaw, 2004; Gupta, Smith & Shalley, 2006) this idea is widely accepted, to the extent that most articles introduce either exploration capability or (radical) innovation performance, but not both, in the same model. In many cases exploration is operationalised directly as an innovation outcome: exploratory, radical or irregular innovations (e.g. Jansen et al., 2006). For this reason few studies specifically compare the relationship between exploration capability (and exploitation capability) the results of radical (or incremental) innovation (exceptions include Atuahene-Gima, 2005; Arnold, Fang & Palmatier, 2011; Kortman, 2015).

Furthermore, exploration capabilities are also needed to absorb shared capabilities in exploration and to transform them into radical innovation. Exploration capabilities also increase the value of the shared capabilities in exploitation present in the cluster. Shared capabilities in exploitation combined with firms' exploration capabilities enrich the possibilities of producing radical innovations (Hoang & Rothaermel, 2010). Hence, exploration capability facilitates radical innovation, which leads us to propose our fifth hypothesis.

H5. There is a positive relationship between firms' exploration capabilities and radical innovation.

Exploration capabilities also influence incremental innovation. To reinforce processes and technologies that produce incremental improvements, new skills that organisational members learn should improve the way they perform their current activities. Diversity in knowledge, provided by an extensive search for knowledge, in which exploration capabilities are based, aids the expansion of existing knowledge through the cross-fertilisation of ideas (Quintana-García & Benavides-Velasco, 2008). Exploration capabilities provide an openness

and flexibility in organisation processes that has spillover effects, yielding radical as well as incremental innovations (Blindenbach-Driessen & Ende, 2014; Tushman & O'Reilly, 1996). Dewar and Dutton (1986) demonstrate how diversity in the knowledge base, measured by the number of people in different technical specialties representing diverse knowledge resources, aids radical innovation and, although to a lesser extent, also enhances incremental innovation. New knowledge provides the firm with a richer background that allows it to associate this knowledge with the knowledge structures it is already familiar with, and therefore to produce incremental innovations. –For example, in the case of technological knowledge, Zhou and Wu (2010) state that new developments have an impact on breaking innovations and also allow firms to improve their existing products and processes. Moreover, other authors such as Quintana-García and Benavides-Velasco (2008) test the proposal that diversity in the knowledge search has a positive relationship with incremental innovation (although to a lesser extent than with radical innovation). Martínez-Ros and Orfila-Sintes (2009) state that resources and capabilities developed for certain degrees of innovation will also have value for other degrees: exploration capabilities that are expected to produce new knowledge deriving in radical innovations are also valuable in incremental innovations. Although Atuahene-Gima (2005) found a negative relationship between exploration and incremental innovation, we follow the previous arguments to propose a positive relationship. Therefore, we posit the following hypothesis:

H6. There is a positive relationship between firms' exploration capabilities and incremental organisational innovation.

Exploitation capabilities have been shown to improve efficiency and focus on providing new solutions that are close to the firm's current experience (March, 1991). Exploitation capabilities foster efficiency through the evolution and recombination of existing organisational knowledge. Exploitation capabilities give firms a better understanding of the

value and applications of the knowledge related to their existing knowledge base, and therefore provide the foundation to develop their current skills, products and processes (Benner & Tushman, 2003). Existing knowledge should be used to incrementally improve the organisation's processes. By searching for familiar and proximate knowledge, the organisation should produce incremental innovation, not radical changes. The nature of exploitation is related to refinement and extension in organisational learning (March, 1991), providing deeper knowledge in a particular and specific field. It builds on existing knowledge by reinforcing processes, skills and activities (Levinthal & March, 1993). Therefore it is expected to produce incremental changes. In a context of alliances between firms, Faems et al. (2005) found evidence of the positive influence of exploitative collaboration with suppliers and customers on incremental innovation. When the firm is more experienced and efficient in some activities, learning reinforces such processes (Benner & Tushman, 2003). The following hypothesis reflects this idea.

H7. There is *a* p*ositive relationship between firms' exploitation capabilities and incremental organisational innovation.*

Methodology

Sample

The empirical research was performed on a database of Spanish tourism firms compiled from an initial questionnaire study, using a set of procedures recommended for survey research and involving a modified version of Dillman's (1978) total design method. This approach applies a range of practices to ensure the maximum response rate and the greatest possible data reliability. These practices include using a questionnaire validated by pilot tests; identifying a coordinator in the firm who manages the information and has the necessary knowledge to provide valid responses; including a report with the questionnaire setting out the project's

aims and its expected contributions; and providing a contact telephone number and electronic mail to answer any questions about the survey. Table 1 presents the basic technical data of the empirical study. Prior to administering the final questionnaire, it was pre-tested on a group of five academics specialising in the fields of tourism and strategy. This pre-test was held in the first two weeks of November 2009. The resulting questionnaire was then also administered to eight managers from firms of different sizes and activities in the tourism sector. The managers' comments and suggestions for improvement were taken into account in the final questionnaire design.

--- Insert Table 1 about here---

The study began with a request to the National Statistics Institute (INE) for an ad hoc application of the DIRCE (Central Directory of Spanish Companies) in order to determine the reference universe and its geographical distribution by activity and size. On the basis of this universe, a stratified random sampling procedure by size, subsector and regional location was then applied to select an initial sample of 1019 firms. The information was obtained from a survey carried out through personal interviews with the firms' most senior managers. These interviews were conducted by a company specialised in tourism market research, in close collaboration with the research team responsible for the project. The fieldwork team was made up of 18 people with experience in survey-based interviewing and medium to high level academic qualifications that facilitated their understanding and administration of the questionnaire. The questionnaire was previously sent to the managers to ensure they had time to read it and consider their responses. Appointments were then made by telephone or electronic mail. Firms that initially declined to participate in the study were substituted by others with the same socio-demographic characteristics (by activity, location and size stratum). The average length of each interview was one hour and this field work was carried out from December 2009 to March 2010.

The sample was distributed as follows: 62.71% micro-firms, 25.22% small firms, 9.62% medium-sized firms, and 2.45% large firms. By type of tourism activity, 30.03% provided accommodation, 37.88% were restaurants/catering firms, almost 11% were intermediaries (travel agencies, tour operators, etc.), 3.93% were transport organisations, and 17.17% made up what is known as the complementary offer. The firms included in the final sample, although heterogeneous, were differentiated by their size, their stock of resources and capabilities, and their strategy. These factors can correctly capture the differences among their business models.

Analytical Techniques

We used a two-stage structural equations model (SEM) to test the theoretical model (Anderson & Gerbing, 1982; Hair, Anderson, Tatham, & Black, 1998). We applied the EQS 6.1 program to estimate the structural models, and the maximum likelihood method with robust estimators to estimate the parameters to alleviate the requirements of normality (Satorra & Bentler, 1994).

Measurement of Variables

Figure 1 shows our operational model including the constructs and their items. The Appendix presents descriptions of each item. Dependent variables were measured by obtaining an innovation score. Independent variables were measured by 7-point Likert-type self-evaluation scales. Specific details about the measurement of each construct are provided below. To avoid the risk that respondents' answers might not be independent if all questions for the same dimension of a construct were presented in related sections, we randomised the presentation of the questions by mixing the items. The 'robot effect' in responses was avoided by a control process that consisted of formulating certain items inversely. A third mechanism used was the inclusion of questions on the same topic in different formats and sections of the questionnaire

to control for response reliability.

--- Insert Figure 1 about here ---

In order to reduce the potential problem of autocorrelation, we placed dependent variables after independent variables in the questionnaire to reduce the impact of respondents' implicit effectiveness theories (Podsakoff & Organ, 1986). Moreover, since all the six constructs were measured using items in a questionnaire completed by a single respondent, we also conducted Harman's one-factor test (Podsakoff & Organ, 1986) to check whether common method variance was a serious issue. No general factor was apparent on the unrotated factor solution. That is, multiple factors were detected, and the variance did not merely stem from the first factors (Podsakoff & Organ, 1986).

Moreover, we verified the convergent validity of the subjective measures from self-evaluation with objective measures both internal and exogenous to the firm (details below).The statistical tests do not eliminate the threat; however they suggest that our results are not driven predominantly by common method variance.

Shared Capabilities in Exploitation

Following the conceptualisation explained above, this construct was evaluated from managers' perceptions of the endowment of shared capabilities in creating a common strategic plan, policies and communication activities, a comprehensive tourist product and special relationships in the commercialisation chain that benefit the global image and positioning of the tourist destination in which the firm is located. To develop the final scale to measure shared capabilities, presented in Table A (see Appendix), we adapted four items from the dimensions "shared vision", "collective reputation" and "value system" proposed by Camisón (2004).

Shared Capabilities in Exploration

Based on the theoretical definition presented above, this variable was evaluated from managers' perceptions of the endowment of shared capabilities in knowledge creation, knowledge diffusion, learning flows and support services to establish cooperation agreements in the tourist cluster in which the firm is located. To develop the final scale to measure shared capabilities, presented in Table B (see Appendix), we adapted four items from the dimensions "external acquisition of knowledge" and "collective learning" comprising the scale of shared capabilities introduced by Camisón (2004).

Exploration and Exploitation Capabilities

Exploration and exploitation capabilities were measured following the study by Atuahene-Gima (2005) (see Tables C and D, respectively, in the Appendix). These measurement scales gather the theoretical conceptualisation of the two capabilities presented in the theoretical framework of the paper, consistent with the definition by March (1991) and Levinthal and March (1993). Both measurement instruments have also been used and validated in other studies (e.g. Wang & Rafiq, 2014; Molina-Castillo, Jiménez-Jiménez, & Munuera-Alemán, 2011; Hernández-Espallardo, Sánchez-Pérez, & Segovia-López, 2011; Rabeh, Jiménez-Jiménez, & Martínez-Costa, 2013; Arnold et al., 2011), and their applicability to any sector has thus been demonstrated.

Radical and Incremental Organisational Innovation

In contrast to the capabilities of the firm, the innovative outcomes they produce can indeed have certain characteristics that are peculiar to the context or sector in which they are obtained. For this reason new measurement scales were developed for the radical and incremental innovation based on a direct study of the knowledge about the tourism sector and a major review of the literature on the subject, covered in the theoretical framework.

Particular note should be made of works by Sundbo, Orfila-Sintes and Sorensen (2007) in considering technological innovations, but distinguishing different technologies or instruments used for managing business processes that could be important in the tourist sector as outlined by Buhalis (1998). Specifically, our research team helped to develop a research project designed to learn about the sources of tourism innovation and the types of innovations obtained according to how innovative or radical they are. The validity and applicability of the two innovation scales were verified by means of a pre-test of the questionnaire with five specialised academics and the eight managers of tourism firms.

Scales are created with zero-one scale items, and then they are summed to obtain an innovation score (see Tables E and F in the Appendix).

Control Variables

Size was measured by the logarithm of the number of employees in the firm. *Technological age* was measured by the logarithm of the number of years since the last major renovation of the firm's physical assets. The variable *competitive environment attractiveness* was operationalised using a nine-item scale based on the five dimensions introduced by Porter (1985) (see Appendix Table G), and taking the average rating of the items.

Table 2 shows the correlation, means and standard deviations for the variables used in the regression analyses.

---Insert Table 2 about here---

Results

Measurement Model

Exploratory analysis was conducted using principal component extraction with varimax rotation. All of the expected constructs were formed (see Table 3). To develop a measurement

model, we ran a joint confirmatory factor analysis for all latent factors (see Table 4). This analysis resulted in certain modifications to the initial model in order to achieve a good fit; namely, item ST4 from the initial scale of shared capabilities in exploitation was eliminated following the instructions of the LMTEST. To test the dimensionality of the constructs, we studied the goodness of fit of the measurement factor model on the basis of the estimation technique proposed by Hair et al. (1998). Table 4 summarises the results, including the internal consistency or reliability measures (conjoint reliability index). All index fits present good statistics. In addition, the standardised factor loadings of each indicator are positive in the factor to which they have theoretically been assigned (with null weightings in other factors), and above the minimum value of 0.50 (Hair et al., 1998) (see Table 4). The values of the estimated parameters are also statistically significant ($t \geq 1.96$; $\alpha = 0.05$) (Anderson & Gerbing, 1982). The reliability measures of latent constructs (conjoint reliability index) also meet the statistical threshold of 0.60 in exploratory research (Churchill, 1979) (see Table 4). To estimate the reliability of the individual items we used the R2 statistic (Hair et al., 1998).

---Insert Table 3 about here---

---Insert Table 4 about here---

Factor loadings are also an indicator of construct validity, together with the amount of variance explained which exceeds the threshold of 50% (Hair et al., 1998). We also evaluated discriminant validity from the correlations matrix between each of the model's dimensions. The levels of correlation between the variables are low, below 0.6 (see Table 2) (Churchill, 1979), confirming the discriminant validity of the model. Finally, following the RBV which identifies innovation as a basic source of economic rents, we evaluated the predictive validity from the correlation between radical and incremental innovation and economic performance. We measured economic performance from the net sales figures reported in the 2008 annual accounts compiled in the Iberian Balance Sheet Analysis System (SABI) database. The results

indicated a positive correlation ($p<0.01$) between performance and both radical innovation ($r=0.208$) and incremental innovation ($r=0.100$).

Structural Model

The hypotheses were jointly assessed by the structural model (Figure 1). The model is correctly identified and can be properly estimated. It is over-identified (degrees of freedom > 0) and has adequate fit indexes (BB-NNFI = 0.917; CFI =0.931; IFI =0.933; NC =2.20; RMSEA = 0.054). All the parameters were significant at the 0.05 level, the factor loadings were greater than 0.50 for all except two items (SR3=0.438; ET2= 0.417, Figure 1), which came close to the minimum level; we therefore decided not to eliminate them so as not to weaken the definition of the construct domains, and the composite reliabilities exceeded 0.60. The measurement model, therefore, fits the data with reliable and valid measurement indicators. The hypothesised model explained 32% of the variance in radical innovation (R^2 = 0.320) and 30% of the variance in incremental innovation (R^2 = 0.301).

Our hypotheses 1 and 2 predicted that shared capabilities in exploitation would be positively associated with exploitation capabilities and exploration capabilities, respectively. The structural model confirms direct, positive and statistically significant relationships between the constructs ($\beta1 = 0.196$, $p< 0.01$) (Hypothesis 1) ($\beta2 = 0.313$, $p< 0.001$) (Hypothesis 2).

Hypothesis 3, which predicted a positive, direct relationship between shared capabilities in exploration and exploration capabilities, respectively, also tested positively. In the structural equations of the relationship model we obtained a positive and statistically significant coefficient ($\beta3 = 0.307$, $p< 0.001$) (Hypothesis 3).

The direct relationship between shared capabilities in exploration and exploitation was not significant ($p> 0.05$), confirming the fully mediating role of exploration capabilities on this relationship expressed in Hypothesis 4 ($\beta4 = 0.155$, $p< 0.01$) (Hypothesis 4).

Hypotheses 5 and 6 suggested that exploration capabilities would have a positive, direct effect on radical innovation and incremental innovation, respectively. The results of the structural model also confirm these positive direct relationships between the constructs (β5 = 0.257, $p< 0.01$) (Hypothesis 5) and (β = 0.234, $p< 0.001$) (Hypothesis 6).

Hypothesis 7 predicted that exploitation capabilities would be positively associated with incremental innovation. The structural model confirms a direct, positive and statistically significant effect on incremental innovation (β7 = 0.170, $p < 0.001$) (Hypothesis 7). The path included in the model of the relationship between exploitation capabilities and radical innovation is not statistically significant (β = 0.126, $p > 0.05$).

Considering the control variables, size has a strong positive effect on both radical (0.419, $p < 0.01$) and incremental innovation (0.336, $p < 0.001$), confirming Schumpeter's classic arguments that large firms have many advantages over small ones in their ability to produce innovations (Schumpeter, 1934). This author argues that large firms enjoy economies of scale in research and development, can spread risks widely, and have greater access to market and financial resources. Although the age of the firm's physical assets has a negative effect on both radical (-0.070, $p > 0.05$) and incremental innovation (-0.073, $p > 0.05$) they are non-significant. Competitive environment attractiveness has a positive significant effect on both radical (0.228, $p < 0.05$) and incremental innovation (0.137, $p < 0.001$), confirming the premises of contingency theory.

Alternative Model Evaluation

The hypothesised model (Figure 1) establishes a fully mediating effect of shared capabilities in exploration and exploitation on the relationship between firm-specific exploration and exploitation capabilities and innovation. Following the recommendations for the evaluation of causal models in management research (Baron & Kenny, 1986; Piccolo & Colquitt, 2006), and considering the complexity of our final model, we conducted additional analyses to test

the validity of a non-mediated model (Model 1, Figure 2), and a partially mediated model (Model 2, Figure 3).

We tested the fit of these alternative models according to the significance of the change in chi-square (Kline, 1998). In Model 1, the data do not fit well (NNFI = 0.869; CFI = 0.890, IFI = 0.892, NC = 2.55, RMSEA = 0.068), indicating that the hypothesised model is superior to the non-mediated model. In Model 2, the data fit well (NNFI = 0.958; CFI = 0.966, IFI = 0.966, NC = 1.49, RMSEA = 0.038), and the chi-square is significantly lower than that in our hypothesised model (Figure 1) ($\Delta\chi^2$ =100.12, $p < .001$). Because Model 2 has greater fit indexes and the difference in chi-square is statistically significant, this alternative model is considered superior to the hypothesised model. Thus, the data indicate that the path between shared exploitation capabilities and incremental innovation represents an improvement in explaining incremental innovation; that is, shared capabilities in exploration have a direct and indirect effect through firm-specific capabilities on organisational incremental innovation.

Discussion and Implications

Clusters are regarded as important elements in economic development and learning-based processes of innovation, change and improvement (Malmberg & Maskell, 2002; Porter, 1998). The key factor determining why clusters play this role is the wealth of resources and capabilities located and shared within them. Shared capabilities will enhance the process of interactive learning and create an innovative milieu favourable to both radical and incremental innovation (Novelli et al., 2006; Saxena, 2005). However, there is little research on the effect of shared capabilities as triggers of intra-cluster firms' exploration and exploitation capabilities and innovation.

This paper contributes to the discussion of the processes of radical and incremental innovation by developing an integrative model that identifies four interrelated capabilities of knowledge building: shared capabilities in exploration and exploitation, and firms' capabilities in exploration and exploitation. Specifically, this study focuses on organisational innovations linked to technical innovations, particularly those related to the diffusion of innovation technologies, the importance of which has been highlighted in the tourism sector (Camisón & Monfort-Mir, 2012; Jacob et al., 2003; Jolly & Dimanche, 2009; Orfila-Sintes et al., 2005; Rodríguez et al., 2014).

Our research extends the previous theoretical framework by offering an in-depth analysis of the relationships between cluster-level and firm-level capabilities, aspects that have not been sufficiently explored in the literature.

Our first contribution is to offer a clearer picture of the internal heterogeneity of clusters. The literature based on the canonical concept of the cluster repeatedly emphasises the existence of common models, values and practices in the social community and the internal production structure. However, at the same time clusters are multi-faceted realities in which a diverse range of bodies and networks coexist. Our study provides a theory-based concept of the shared capabilities in exploration and exploitation accumulated in a cluster, differentiated from firm-specific capabilities in exploration and exploitation, which furthers understanding of these asymmetries. This conceptual innovation is important because it extends knowledge of the way in which the cluster's internal information flows interact. The traditional thesis in the literature simplifies the complexity of this flow network by postulating that the knowledge deposited in the cluster flows directly into each firm located within it. This thesis would be manifested in the direct relationship between shared capabilities in exploitation and firm-specific exploitation capabilities and incremental innovation. This conceptual model reconfirms intra-cluster heterogeneity in which firms, subject to the same

flow capabilities arising from geographic concentration and shared cultures and practices, also have differentiated capabilities of their own. In this way, these organisations meet the challenge of learning to manage both types of capabilities. Our study facilitates this task by identifying the patterns of combining shared capabilities that can help intra-cluster firms in their innovative development.

Our study also confirms that the relationships between the capabilities of the two levels and their effects on organisational innovation are truly complex. The empirical study provides significant evidence that the greatest capability for explaining innovation is found in the joint effect of shared capabilities in the tourist cluster and firms' knowledge capabilities. Specifically, the analysis highlights an indirect relationship between shared capabilities in exploration and firm-specific exploitation capabilities, through the mediating effect of firm-specific capabilities in exploration. The absence of a direct effect appears to belie the strong belief rooted in the canonical literature (e.g., Harabi, 1995) which perceives that all the knowledge flows circulating within a cluster can be automatically exploited by all the firms embedded in it. An organisation will not benefit from shared capabilities in exploration to exploit its existing knowledge base if it does not previously invest in developing its capability to accumulate new know-how internally. This internal capability enhances the receptivity of the firm to external knowledge (Lavie & Rosenkopf, 2006). The relationships of cooperation, together with the flows of tacit, codified knowledge and the support of local institutions connected with networks external to the cluster, which integrate the cluster-shared capabilities in exploration, will thus stimulate investment in intra-cluster firms' new exploration capabilities (Camisón & Forés, 2011; Harabi 1995; Veugelers, 1997). This result also verifies previous studies such as that of Mei et al. (2015) which propose that both public institutions' role in R&D and tourism firm-specific capabilities and involvement are crucial to enhance radical innovation.

The study also confirms that radical innovation needs the development of firms' exploration capabilities. Creating variety, risk and experimentation is fundamental to successfully achieve radical innovation. Furthermore, firms' exploration capabilities are essential to interpret and to assimilate the existing knowledge base in the cluster (measured by the shared capabilities in exploitation) and the new knowledge in the cluster (captured by the shared capabilities in exploration).

The study also highlights the need to combine the capabilities firms require to improve their incremental innovation. The cluster's existing knowledge base, combined with the firm's internal knowledge base, is positively associated with higher performance. Additionally, incremental innovation is also stimulated when the firm is able to take advantage of the learning and cooperation among agents in the cluster to create new knowledge (continuous or discontinuous as regards its pre-existing knowledge stock). However, results show that shared capabilities in exploitation also have a significant direct effect on incremental innovation. This evidence demonstrates that firms which complement each other to form part of the global tourist product of the cluster, and of its networks and support services, can easily absorb the exploitation capabilities in the cluster because the cognitive models and knowledge structures that underlie their generation are shared by and familiar to all the firms in the cluster. The ease with which the exploitation capabilities in the cluster can be identified and integrated means that they can be directly transferred to improve the firm's existing processes, operations and knowledge base, thereby affecting its incremental innovation, without having to be previously 'filtered' by the firm; that is, without having to be combined with their internal capabilities.

These results suggest important **implications for managers**. The way firms manage innovation will vary depending on the type of innovation the management wishes to encourage. Organisational innovations that involve discontinuity, a basic change in the way

processes are organised, will need to foster experimentation and organisational variation in developing the learning and skills of the organisation's members. By opening up and being flexible to new ways of understanding organisational processes, firms will also be able to take advantage of both the tacit and explicit knowledge that flows around the cluster. Specifically, this need for opening up and flexibility is essential for firms to integrate tacit knowledge, since integrating tacit knowledge flows in the cluster that are not easily recognisable does not happen automatically.

In contrast, to encourage organisational innovations that involve more continuous improvement rather than a break with previous ways of organising processes, the firm must invest in internal capabilities more related to improving the efficiency and reliability of the processes. Therefore, managers should consider that they cannot only rely on private exploitation capabilities for developing new practices and organisational methods as such knowledge is highly like to move into the cluster domain over time.

The importance of shared capabilities also suggests some managerial implications. This study demonstrates the support of both internal and external capabilities for organisational innovation in the tourism industry.

In this vein, the importance of knowledge from the environment outside the firm is highlighted, in a sector in which this aspect does not seem to have been acccorded the same importance in the literature as in other industrial sectors. Thus, managers should not only be concerned about the management of their firms' resources and capabilities, but should also take advantage of locally-based assets and participate in their management. To do this, managers should reconsider the importance of introducing systems of competitive monitoring, research observatories, in order to detect and integrate tacit knowledge from the environment that is so valuable when introducing differentiated ways of managing innovation.

Promoting and participating in these mechanisms also becomes an important aspect that should be strengthened by all levels of public administration in order to detect new trends and needs in the sector and help firms to integrate the shared learning process into their own management.

The importance of absorbing shared capabilities also has effects on issues related to localisation. The classic literature on clusters in tourist firms appears to justify the decisions for localisation based on possible access and exploitation of tangible resources, natural resources and cluster economies because of their greater attraction of tourist flows. However, this study goes beyond this classic approach to highlight the importance of localisation in terms of accessing intangible resources or capabilities which, in the final instance, are what determine the capabilities of the firms located there. Hence, managers should understand that the tourism cluster is not so different from its industrial counterpart and should therefore take note of the path it has followed to leverage its capability for innovation.

Public research institutions, trade associations and local authorities can play a vital role in facilitating the trusting relationships needed to develop new knowledge and innovation, and thus in the configuration of diversified networks (Aharonson, Baum, & Plunket, 2008; Perles-Ribes et al., 2015) of intra-cluster firms, particularly SMEs with fewer resources and opportunities for scale economies (Eisingerich et al., 2010; Zach, 2013). Our research suggests that innovation cannot be promoted within a cluster without simultaneously and complementarily stimulating the capacities existing in the cluster and those specific to the agents located within it. Public policies for intra-cluster innovation should take a multi-level focus and promote projects to strengthen the shared knowledge base within the cluster as well as the individual capabilities of its firms in order to create new knowledge, both continuous and discontinuous, that configures the destination in such a way that it retains its historical

strengths and at the same time adapts to new competitive challenges. The support of public research institutions, trade associations and local authorities for cluster firms can thus determine the endogenous capability of regions to innovate and create competitive advantage (McLennan, Ruhanen, Ritchie, & Pham, 2012).

Future investigation could use the measurement scales developed to capture cluster-shared capabilities to distinguish, compare and contrast different typologies of clusters and the way in which location in them produces benefits, and how firms might best take advantage of them. Following from this, firms can locate or relocate their position according to their capabilities and expected innovation outputs (Aharonson et al., 2008). In this line, future research could usefully analyse whether some tourist clusters can be classified as more explorative or more exploitative and how this classification affects the intra-cluster firms and their innovation. The analysis of which factors affect the development of knowledge in the cluster (e.g., Arikan, 2009) can be completed with the study of shared capabilities in the cluster and their link with the cluster cycle to direct efforts towards a more innovative pattern in the cluster.

This study has some limitations that also suggest directions for future research. First, the use of a single informant from an organisation may produce potential bias. Although we have tried to minimise the risk of bias through the rigorous approach taken in gathering the opinions of the surveyed managers, as reflected in their reliability and validity, future studies should address this issue. Second, the sample is limited to Spanish tourism firms. The findings may be peculiar to Spanish firms and should be interpreted with caution until they are confirmed in other nations. A fruitful avenue for future research would also be to test our conceptual model across different industries and service sectors. Third, the data is based mainly on subjective measures and in the case of shared capabilities and innovation, the scales we developed are new. We assessed the validity of our measures through various

analyses and evaluated innovation with objective measures, but future research should provide more objective data to measure the variables related to the cluster and firms' capabilities, and to assess their validity. Fourth, we use traditional SEM for assessing mediation effects of multi-level constructs, as we only have data from the firm level to measure outcomes and mediators. As firms belong to tourism clusters, there could be what is known as a nested effect between these two levels. Future research might consider multilevel structural equation modelling (MSEM) to gather data from other secondary sources, which would allow an inter-district comparison of the impact of the specific endowment of shared capabilities in the firm's assets, without introducing bias (Preacher et al., 2010). We thank an anonymous reviewer for suggesting this valuable methodological improvement. Fifth, the data used in this study is cross-sectional, implying that we could not extract conclusions about causality between the variables introduced in our model. A longitudinal study is therefore needed to examine the dynamics of the relationships proposed. Finally, the model of absorptive capability is one of the most relevant ones for tourism (Awad & Ghaziri 2004). This study has considered that the capability of accumulating new external knowledge is integrated, together with the internal knowledge-creation capacity, in the conceptualisation of the firm-specific exploration capabilities, as they are considered to be overlapping concepts in the literature on dynamic capabilities (Lichtenthaler & Lichtenthaler, 2009; Lane, Koka, & Pathak, 2006). Therefore, an interesting future line of research would be to analyse the separate impact of these two dynamic capabilities of accumulating new knowledge (Camisón & Monfort-Mir, 2012), and their interactions with innovation in the tourism sector.

Appendix

SURVEY

SHARED CAPABILITIES

According to your perception and the information you have, evaluate the situation in the tourist destination or municipality in which your business is located (if located in various places, consider the average of all of them) for the areas identified below in relation to the average of the competitor destinations or municipalities, on a scale of 1 to 7 where 1 is "much worse than our competitors", 4 is "on a par with our competitors", and 7 is "much better than our competitors".

1	2	3	4	5	6	7
Much worse	**Worse**	**Slightly worse**	**On a par**	**Slightly better**	**Better**	**Much better**

Table A. Shared capabilities in exploitation

	Shared capabilities in exploitation
Item	*Description*
ST 1	Firms benefit from the external communication activities carried out cooperatively by distributors, groups of competitors, or business associations in the area.
ST 2	There is an overall strategic plan and policies that are important to improving the tourist destination/cluster as a whole.
ST 3	A comprehensive tourist product is offered through the cooperation of the destination agents.
ST4	Complementariness (firms in the tourist destination/cluster are highly complementary all through the value system or along the production chain) which cannot be reproduced outside.*

* Item dropped from the final scale

Table B. Shared capabilities in exploration

	Shared capabilities in exploration
Item	*Description*
SR1	Support services are available to establish cooperation agreements with firms within the tourist destination/cluster that are difficult to reproduce outside it.
SR2	Firms benefit from common learning processes (about products, processes, technologies, markets and customers) stimulated by leading R&D centres in the industry – technological institutes or universities – suppliers or clients located in the tourist destination/cluster.
SR3	Knowledge is created through cooperation with customers, suppliers, competitors, and/or R&D organisations (frequency and importance of relationships and cooperation to create knowledge and innovations by developing joint projects, strategic alliances, business meetings, temporary exchanges of staff, etc).
SR4	There is a model or pattern of relationships for the informal transmission of innovations, technologies and knowledge within the tourist destination/cluster that cannot be reproduced outside the area.

Table C. Exploitation capabilities

Atuahene-Gima, K. (2005)

Over the last three years, to what extent has your firm…

	Exploitation capabilities
Item	*Description*
ET1	Upgraded current knowledge and skills for familiar products and technologies?
ET2	Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations?
ET3	Enhanced competences in searching for solutions to customer problems that are close to existing solutions rather than completely new solutions?
ET4	Upgraded skills in product development processes in which the firm already possesses significant experience?
ET5	Strengthened its knowledge and skills for projects that improve efficiency of existing innovation activities?

Table D. Exploration capabilities

Atuahene-Gima, K. (2005)

Over the last three years, to what extent has your firm…

	Exploration capabilities
Item	*Description*
ER1	Acquired manufacturing technologies and skills entirely new to the firm?
ER2	Learned product development skills and processes (such as product design, prototyping new products, timing of new product introductions, and customising products for local markets) entirely new to the industry?
ER3	Acquired entirely new managerial and organisational skills that are important for innovation (such as forecasting technological and customer trends; identifying emerging markets and technologies; coordinating and integrating R&D; marketing, manufacturing, and other functions; managing the product development process)?
ER4	Learned new skills in areas such as funding new technology, staffing R&D function, training and development of R&D, and engineering personnel for the first time?
ER5	Strengthened innovation skills in areas where it had no prior experience?

Table E. Radical innovation

Indicate whether your company has introduced the following technologies in its establishments…

	Radical innovation
Item	*Description*
RI1	Integration of voice, data and video services (telephony, interactive TV, video on demand, video conferencing, etc.).
RI2	Document management tools.
RI3	Workflow management tools.
RI4	Relational databases (CRM) to improve customer service.
RI5	Postcards to track customers.
RI6	Software (ERP).
RI7	Systems for knowledge management (search engines, knowledge maps, etc.).
RI8	Development of sustainable buildings.
RI9	Industrial automation (intelligent storage chambers, kitchens with energy efficient control, etc).
R10	Advanced surveillance and security technologies.

Table F. Incremental innovation

	Incremental innovation
Item	*Description*
II1	Computers for management.
II2	Customer management computerization.
II3	Purchasing and supplier management computerisation.
II4	Accounting computerization.
II5	Broadband Internet connection.
II6	Own Internet domain.
II7	Company website hosted on external server.
II8	Email for staff.

Table G. Environmental attractiveness

Evaluate, according to your perception, the degree of intensity in which the following characteristics are present in your activity, on a scale of 1 to 7 where 1 is “very low”, 4 is “on a par”, and 7 is “very high”.

	Environmental attractiveness
Item	*Description*
EA1	Usefulness of past experience to face future challenges
EA2	Diversity of consumers by purchasing habits
EA3	Diversity of suppliers
EA4	Degree of presence of differentiated products within the activity
EA5	Diversity of viable technologies to develop the activity
EA6	Intensity of capital investment required to enter the activity
EA7	Your market has consumers with very different characteristics
EA9	Competitors in the activity have the capability to differentiate in quality and service
EA9	Difficulties for new competitors to enter the business

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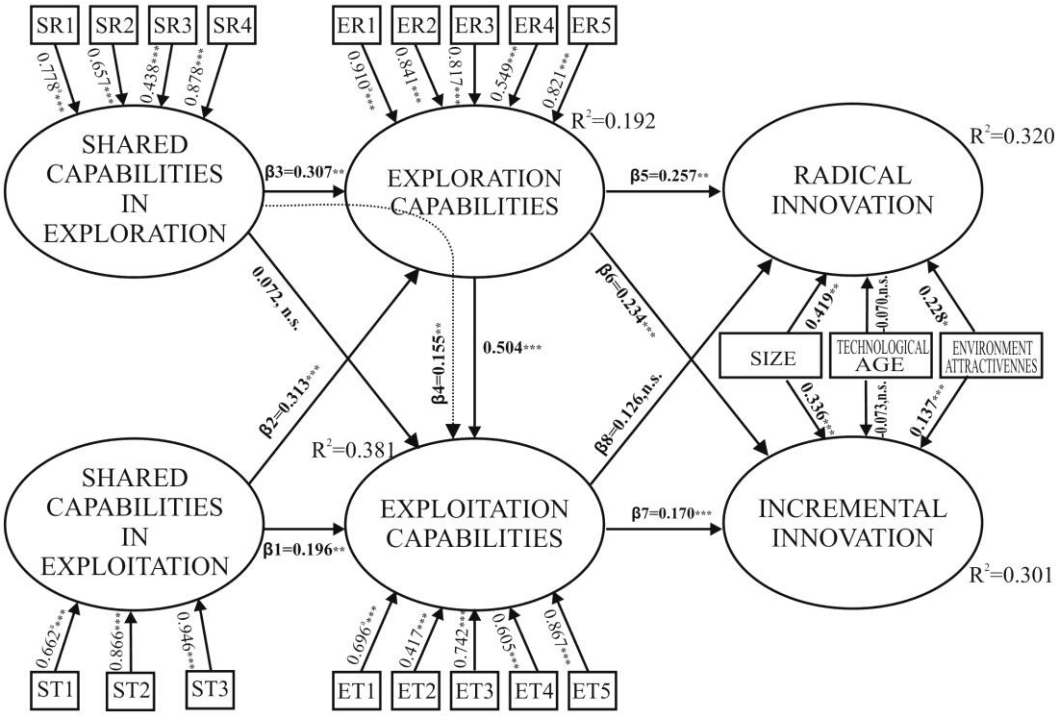
Figure Captions

Figure 1. Theoretical Model [a]



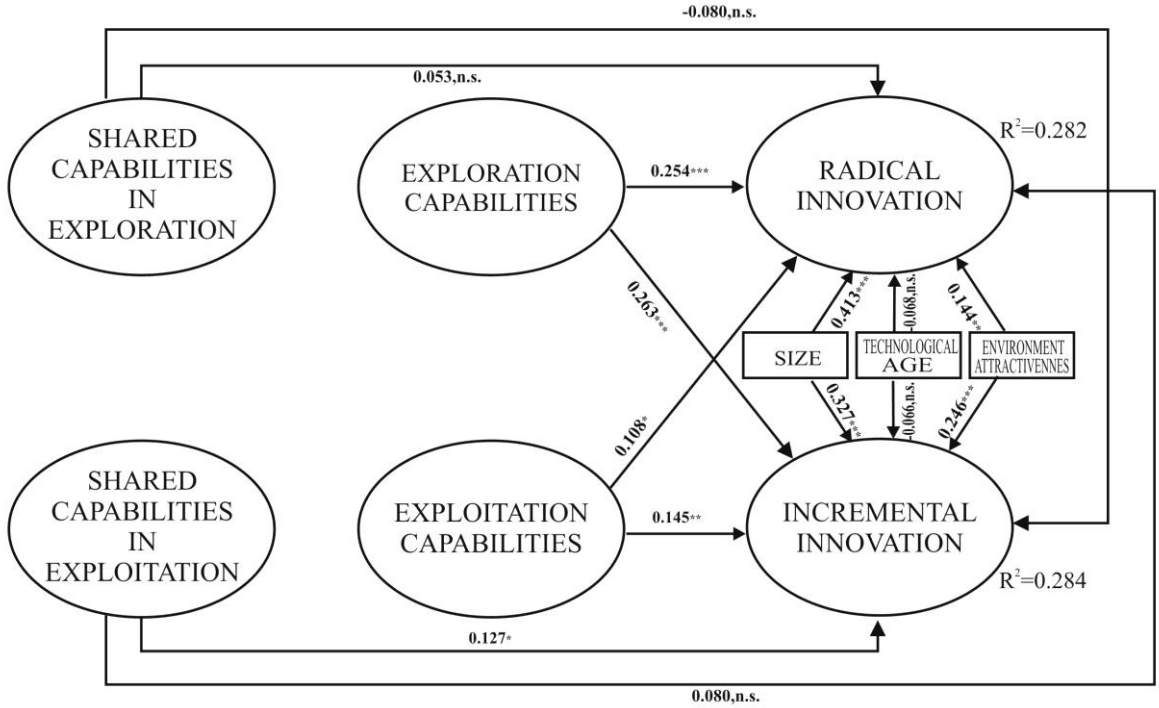
χ^2 = 384.10, d.f.= 194; BB-NNFI = 0.917; CFI =0.931; IFI =0.933; NC = 1.98; RMSEA = 0.054

[a]Parameter equal to one to determine the scale of the latent variable

[b]See annexes for a full description of the items

* p< .05; ** p< .01, ***p<0.001

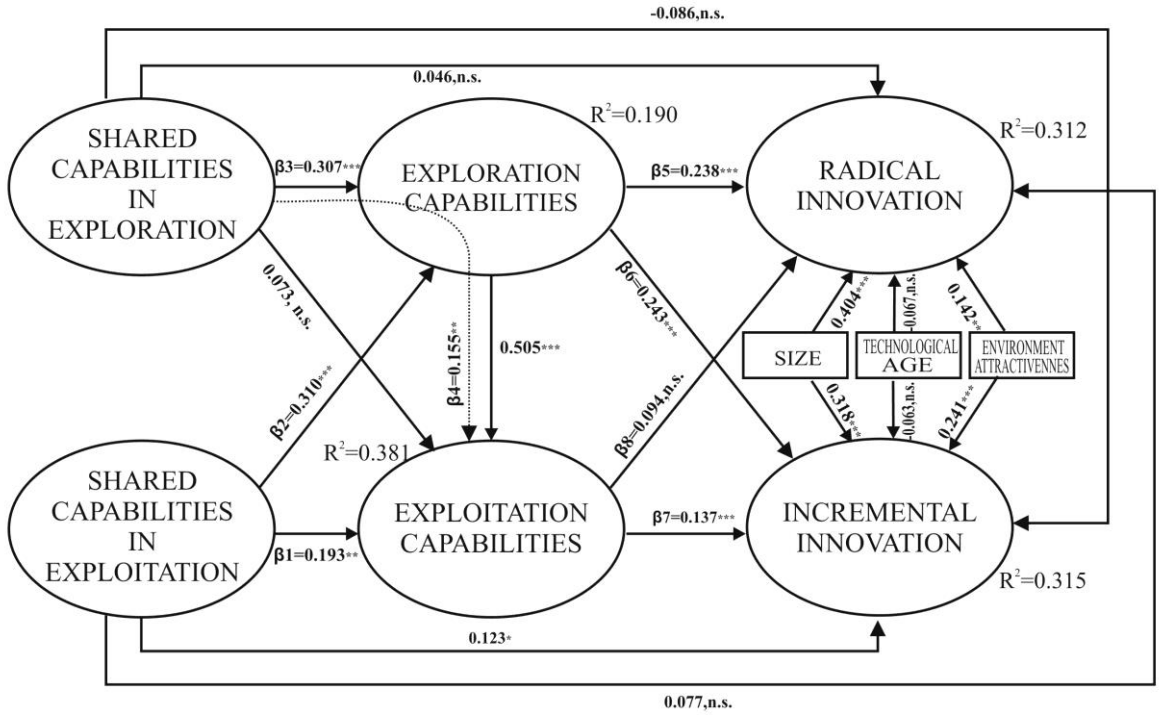
Figure 2.Non-mediated model. Direct effect of shared capabilities and firm-specific capabilities on innovation



χ^2 = 498.24, d.f.= 195; BB-NNFI = 0.869; CFI =0.890; IFI =0.892; NC =2.55; RMSEA = 0.068

* p< .05; ** p< .01, ***p<0.001

Figure 3. Partially-mediated model. Direct and indirect effect of shared capabilities through firm-specific capabilities on innovation



χ^2 = 283.98, d.f.= 190; BB-NNFI = 0.958; CFI =0.966; IFI =0.966; NC = 1.49; RMSEA = 0.038

* p< .05; ** p< .01, ***p<0.001

Tables

Table 1. Data of the empirical study

Universe	Spanish tourism firms
Data gathering	Personal interview with the firms' President, Chair or CEO using the structured questionnaire technique
Final sample	1,019 firms
Margin of statistical error	± 3.1% (confidence interval of 95.5%)
Field work data	December 2009 – March 2010
File compilation and edition period	March – July 2010

Table 2. Means, standard deviations, skew, kurtosis and correlations among study variables

	Variable	Mean	SD	Skew	Kurtosis	1	2	3	4	5	6
1	**Shared competences in exploitation**	3.888	1.579	-0.084 (0.083)	-0.573 (0.165)	1	.355(**)	.298(**)	.360(**)	.426(**)	.380(**)
2	**Shared competences in exploration**	4.064	1.003	-0.209 (0.086)	1.037 (0.171)	.355(**)	1	.147(**)	.289(**)	.199(**)	.203(**)
3	**Exploitation capabilities**	3.961	1.557	-0.622 (0.082)	-0.385 (0.163)	.298(**)	.147(**)	1	.529(**)	.322(**)	.323(**)
4	**Exploration capabilities**	3.451	1.358	0.159 (0.081)	-0.357 (0.162)	.360(**)	.289(**)	.529(**)	1	.427(**)	.420(**)
5	**Incremental innovation**	3.900	3.042	-0.059 (0.077)	-1.551 (0.154)	.426(**)	.199(**)	.322(**)	.427(**)	1	.573(**)
6	**Radical innovation**	1.468	2.359	1.878 (0.077)	2.932 (0.154)	.380(**)	.203(**)	.323(**)	.420(**)	.573(**)	1

*p<0.05; **p<0.01

Table 3. Exploratory Factor Analysis of the construct measurement model

		1	2	3	4
Shared competences in exploitation	ST1	0.198	0.194	0.772	0.023
	ST2	0.120	0.247	0.802	0.196
	ST3	0.119	0.139	0.870	0.139
	ST4	0.171	0.096	0.569	0.178
Shared competences in exploration	SR1	0.190	0.049	0.233	0.779
	SR2	-0.005	0.036	0.124	0.807
	SR3	0.209	0.150	0.002	0.637
	SR4	0.101	0.108	0.174	0.845
Exploitation capabilities	ET1	0.238	0.750	0.105	0.081
	ET2	0.076	0.571	0.100	0.077
	ET3	0.202	0.774	0.209	0.043
	ET4	0.244	0.675	0.074	0.067
	ET5	0.246	0.735	0.317	0.144
Exploration capabilities	ER1	0.872	0.205	0.214	0.145
	ER2	0.849	0.238	0.096	0.124
	ER3	0.836	0.291	0.092	0.113
	ER4	0.461	0.213	0.244	0.169
	ER5	0.827	0.171	0.192	0.095

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalisation

Rotation converged in 6 iterations

Table 4. Confirmatory Factor Analysis of the construct measurement model[a]

Factors	Standardised factor loadings	t values[c]	R^2	Cronbach's alpha	Conjoint reliability
Shared competences in exploitation				0.841	0.783
ST1	.680[b]		.462		
ST2	.859	12.789	.739		
ST3	.908	13.316	.825		
Shared competences in exploration				0.801	0.755
SR1	.806[b]		.267		
SR2	.668	7.517	.446		
SR3	.517	6.199	.650		
SR4	.878	8.288	.770		
Exploitation capabilities				0.910	0.855
ET1	.819[b]		.671		
ET2	.660	14.945	.435		
ET3	.874	36.468	.764		
ET4	.780	26.484	.608		
ET5	.900	47.469	.810		
Exploration capabilities				0.888	0.851
ER1	.918[b]		.842		
ER2	.860	35.453	.739		
ER3	.870	38.488	.757		
ER4	.552	14.165	.304		
ER5	.844	34.620	.713		

CFI Fit Index	Up to 0.9	.963
BB-NNFI Fit Index	Close to 0.9	.955
Normed Chi Square	Between 1 and 5	2.62

Notes:

[a] See annexes for a full description of the items.

[b] Parameter equal to 1 to determine the scale of the latent construct.

[c] The t values over 1.96 are significant at a level of 5% (two tails).

[d] RMSEA = Root Mean Square Error of Approximation index; IFI = Incremental Fit Index; CFI = Comparative Fit Index; BB-NNFI = Bentler-Bonnett Non-Normed Fit Index; NC = Normed Chi-Squared.