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1. Introduction

Although there is now an extensive literature that promotes knowledge management (KM), there is still a worrying lack of empirical studies demonstrating an actual connection between KM activities and organizational outcomes (Andreeva and Kianto, 2012). Over the past few decades and in the current climate, a firm's attitude towards the customer has become crucial because the role of the customer has changed from that of a mere consumer to one of consumer, co-operator, co-producer, co-creator of value and co-developer of knowledge and competencies (Wang *et al*., 2004). According to Drucker (1954), the mission and goal of all firms is customer satisfaction, and this is achieved when firms offer a superior value to their customers (Darroch *et al*., 2009). As a result, in the complex competitive environment in which firms operate, they see customer value as a key factor when seeking new ways to attain and maintain a competitive advantage (Woodruff, 1997). KM has become increasingly important as organizations realize that effective use of knowledge assets and resources equips them to innovate and respond to fast-changing customer expectations (Sandhawalia and Dalcher, 2011).

Much has been written about why it is important to manage knowledge, but considerably less has been written about how it should be managed; that is, about the processes that are used to identify, capture, share and use knowledge in firms (e.g. Earl, 2001; Ipe, 2003). There has also been considerable discussion in the recent literature of the relationship between knowledge structures and customer value (Despres and Chauvel, 1999; Gebert *et al*., 2003; Rezgui, 2007). Although Vorakulpipat and Rezgui (2008) suggest that knowledge structures have inherent value creation capabilities, some questions still remain over this theoretical justification. Moreover, there are no examples in the literature that examine the impact of the relationship between knowledge structures on customer value creation. This study addresses the gap in the literature by proposing a certain sequence of KM processes that increases customer value and it also aims to identify how these sequence influence customer value creation.

Knowledge in a firm emerges from both inside and outside the firm. The ability of a firm to combine external knowledge with internal knowledge is therefore essential if a business is to align its processes, products and services to build customer value. One way that this might be achieved is to develop knowledge structures to competitively operate in the market and satisfy customer needs (Carballo-Cruz, 2001). It is with this in mind that the authors of this paper propose that the ability and willingness of managers to engage in these activities is enhanced through the combination of what the authors refer to as 'knowledge structures'. The focus of this paper is on the combination of these processes; while external knowledge is managed by knowledge corridors (potential absorptive capacity, realized absorptive capacity), at the organizational level internal knowledge is managed by knowledge processes (knowledge transfer, knowledge storage/retrieval and knowledge application). This study addresses the question: "What is the nature and strength of the relationship between the existence of knowledge structures and customer value?" These relationships are examined through an empirical investigation of 76 commercial and savings banks in Spain.

From a practical point of view, the key managerial implication of this paper is to contribute to the knowledge management literature by determining the relationship between the different structures of KM (potential absorptive capacity, realized

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absorptive capacity, knowledge transfer, knowledge storage/retrieval and knowledge application) and the potential effects of this relationship for increasing customer value creation. The authors attempt to identify possible combinations of the different structures of KM and propose and analyze a sequence for creating superior customer value.

The paper begins with an explanation of the theoretical context, followed by a presentation of the study model and the positing of a number of hypotheses. The next section contains a description of the principal aspects of the methodology, such as the research context, measures, data collection and the data analysis technique (structural equation modeling, SEM). A discussion of the results and implications of the study follows and the paper concludes with the limitations of the study and possible areas of further research.

2. Theoretical Background

According to Ragab and Arisha (2013), knowledge is the currency of the current economy, a vital organizational asset and a key to creating a sustainable competitive advantage. Knowledge is an intangible resource, and the alignment and integration of intangible resources in a firm, although complex, is a crucial issue in value creation (Kaplan and Norton, 2004). In recent years, intangible resources have replaced tangible ones as key elements of firm value creation (Swamy, 2004). Given the importance of firms' intangible assets, ways must be found of managing them (Spender, 2006). KM emerges as a way of managing these intangible resources, as opposed to the previous management of tangible ones (Spender and Scherer, 2007).

The assumption that KM is an organizational capability implies that firms need to possess a set of resources in order to create, use and share knowledge (Chou *et al*., 2007; Lin, 2007; among others). Given the importance of external knowledge for developing and increasing employees' knowledge and learning capabilities (Jantunen, 2005; Newey and Zahra, 2009), absorptive capacity represents an important part of a firm's ability to create new knowledge (Chou, 2005; Lane *et al*., 2006; Liao *et al.*, 2010; Van den Bosch *et al.*, 1999). The first to introduce the concept of absorptive capacity were Cohen and Levinthal (1990), who introduced the concept to explain why some firms are better able to take advantage of available external knowledge than others in the industry (McDonald and Madhavaram, 2007). Developing and maintaining absorptive capacity is critical to a firm's long-term survival and success because absorptive capacity can reinforce, complement, or refocus the firm's knowledge base (Lane *et al*., 2006).

Zahra and George (2002) have advanced the understanding of this process by proposing the existence of two subsets of absorptive capacity (potential and realized). While the term potential absorptive capacity (PACAP) is used to refer to the capacity to acquire and assimilate knowledge, the concept of realized absorptive capacity (RACAP) includes transformation and exploitation capabilities (Fosfuri and Tribó, 2008; Purvis *et al*., 2001). 'Acquisition' refers to a firm's ability to identify and acquire externally generated knowledge that is critical to its operations, whereas 'assimilation' is taken to be the firm's routines and processes that allow it to analyze, process, interpret, and understand the information obtained from external sources. It should also be noted that 'transformation' denotes a firm's capability to develop and refine the routines that facilitate the combination of existing knowledge with newly acquired and assimilated knowledge. This is accomplished by adding or deleting knowledge or simply by interpreting the same knowledge in a different way. 'Exploitation' is based on the routines that allow firms to refine, extend, and leverage existing competencies or to

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create new ones by incorporating acquired and transformed knowledge into its operations.

Research on KM is often limited to internal processes of knowledge, but absorptive capacity focuses on a firm's use of external knowledge (Lane *et al*., 2006). In turbulent environments, firms tend to rely heavily on external knowledge (Droge *et al*., 2008). Since the accumulation of knowledge is not only a result of the internal development of knowledge, but also of the assimilation of external knowledge, the absorptive capacity of the firm (Cohen and Levinthal, 1990) is critical to its success.

2.1 Knowledge corridors

Firms cannot rely solely on their internal knowledge sources, but should also actively develop their external knowledge sources to obtain knowledge (Escribano *et al*., 2009; Matthyssens *et al*., 2005). In order to improve their knowledge acquisition and appropriation processes, organizations should configure internal and external networks to support this reorganization of their classical structures (Bohorquez and Esteves, 2013). Knowledge workers are distinguished from other workers by the tasks that require them to search for new knowledge, both within and outside the organization, which lead to the creation of knowledge. Following a review of the existing literature, the authors of this paper argue that many terms have been used to describe the process of knowledge creation, such as knowledge acquisition (Cui *et al*., 2005; Gold *et al*., 2001; Jantunen, 2005; Lin, 2007; Lin and Lee, 2005); knowledge generation (Grover and Davenport, 2001); knowledge construction (McAdam and McCreedy, 1999); and knowledge corridors (Shane, 2000).

The concept of a knowledge corridor has been invoked to characterize the way in which prior knowledge may open up a corridor to future opportunities and options (Shane, 2000). It should be noted here that the term "knowledge corridor" is applied in accordance with Ronstadt's (1988) corridor principle, which posits that opportunity recognition is assumed to be a function of both a person's stock of knowledge and previous social knowledge (Ronstadt, 1988). For example, an exposure to the work experiences of other members of the organization also broadens entrepreneurs' range of what they perceive to be a feasible opportunity (Krueger, 2000). From this point of view, for a "knowledge corridor" to occur at an individual level, "an organizational corridor" must first exist at organizational level. The focus of this paper is on the combination of these processes, and the corridor may be viewed as a way of developing an understanding of the individual who is learning from this interaction (Shane, 2000). Knowledge corridors are places in which powerful leaders or organizational members work with external knowledge.

Taking the above into account, the authors would argue that as "new knowledge" is assimilated the corridor that is opened up provides an organization with potential benefits that may be derived from new opportunities that arise as a result of passing through the corridor. These corridors can be seen as providing ways of exploring and structuring an organization's future course of action (Koller, 1988). Put another way, corridors provide a pathway that enables the exploitation and deployment of assimilated knowledge (Short *et al*., 2009). With this in mind, the authors of this paper argue that knowledge corridors can be considered to be closely related to Zahra and George's (2002) notion of absorptive capacity.

2.2 Knowledge processes

The recognition of knowledge as a key resource for firms in the current business environment confirms the need for processes that facilitate individual and collective

knowledge creation, transfer and leverage (Becerra-Fernandez and Sabherwal, 2001; Ipe, 2003; Nonaka and Takeuchi, 1995). Every firm should understand the importance of knowledge and of teaching knowledge skills to their employees and every employee should be encouraged to create, share, search out and use knowledge in their daily routines (Davenport and Prusak, 1998).

The term "knowledge processes" generally refers to the means by which value is added to raw inputs in order to create value for the organization and its clients (Dawson, 2000). Several attempts have been made to identify and define the different knowledge processes. Although there is some disagreement over the number and labeling of knowledge processes (Alavi and Leidner, 2001), a review of the processes that various authors have identified as knowledge processes (e.g. Argote *et al*., 2003; Chang Lee *et al*., 2005; Chen and Huang, 2009; Gold *et al*., 2001; Huang and Li, 2009; Ipe, 2003; Lin, 2007; Sandhawalia and Dalcher, 2011) allows us to identify the following:

<u>Knowledge transfer</u>

Knowledge transfer is basically the act of making knowledge available to others within the organization (Ipe, 2003). To make knowledge available, it is crucial that individuals and departments are involved in the process of knowledge transfer (De Vries *et al*., 2006; Osterloh and Frey, 2000). Knowledge transfer between individuals is seen as an effective way of improving the knowledge that a firm has with regard to its competitors and the industry, and of acquiring local knowledge (Gold *et al*., 2001). Many terms have been used to describe this process, such as knowledge dissemination (Chou *et al*., 2007; Jantunen, 2005); knowledge sharing (Earl, 2001); knowledge distribution (Bhatt, 2001); and knowledge conversion (Cui *et al*., 2005; Gold *et al*., 2001; Lin, 2007; Sandhawalia and Dalcher, 2011).

These definitions suggest that there are different ways of describing types of knowledge transfer but some common elements are the activities that bring organizational members together, from the idea-generation stage to the implementation of evidence-based initiatives. All these terms have a common theme: "the knowledge exchange between the source and the recipient of it" (Baskerville and Dulipovici, 2006). As Gold *et al*. (2001) note, in order to remain competitive in the market, organizational knowledge and skills must be shared between one part of the organization and another, making knowledge transfer activities an essential component in the process of KM (Alavi and Leidner, 2001; Gold *et al*., 2001; Lee and Ahn, 2007).

<u>Knowledge storage/retrieval</u>

The increased focus on KM in organizations raises an interesting question regarding its access and protection (Lucas, 2010). All individuals in a firm must have access to the knowledge base in order to obtain the relevant knowledge to help them in their work and decision-making. A firm's accumulated knowledge can play an important role in removing obstacles and inefficiencies and, at the same time, in improving management performance (Walsh and Ungson, 1991). However, if the knowledge that has been created for years through KM activities is not systematically retained, it cannot be used for the benefit of future decision-making (Chang Lee *et al*., 2005). Storage and retrieval mechanisms give firms quick access to knowledge.

Many terms have been used to describe knowledge storage and retrieval, such as knowledge embodiment (McAdam and McCreedy, 1999); knowledge retention (Argote *et al*., 2003; Levy, 2011); knowledge codification (Baskerville and Dulipovici, 2006; Grover and Davenport, 2001); and organizational memory (Chou *et al*., 2007). The

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common factor of these terms is that they address knowledge retention and its quick and easy access. The objective is to make knowledge accessible to those who need it (Davenport and Prusak, 1998).

These considerations also imply that knowledge storage and retrieval processes are closely related to the idea of 'organizational memory'. In fact, Walsh and Ungson (1991) define organizational memory as 'the stored information from an organization's history that can be brought to bear on present decisions'. In this regard, researchers and practitioners recognize that organizational memory is an important factor for the success of the firm's operations and reactions to the changes and challenges of the environment (Nilakanta *et al*., 2006). As such, organizational memory is simply a collection of knowledge stored in different places in a firm. For knowledge to be used in decision-making, KM must allow access to that knowledge.

Firms create knowledge and learn, but they also forget; that is, firms can lose track of the acquired knowledge (Darr *et al*., 1995). Therefore, the knowledge storage/retrieval process, also referred to as organizational memory, constitutes an important aspect of effective KM (Chou, 2005). In this paper, the authors refer to the combination of factors that facilitate organizational memory and knowledge retrieval as 'knowledge storage/retrieval'. The authors therefore define knowledge storage/retrieval as 'the retention of stored information from an organization's history and its quick and easy access in order to be applied on present decisions'.

Knowledge application

According to Gold *et al*. (2001), knowledge application seems to be assumed by authors since it is not addressed explicitly in the literature. For example, Nonaka and Takeuchi (1995) discuss the ability of a firm to create knowledge, but they seem to assume that once created, it will be effectively implemented. Many authors (e.g. Cui *et al.*, 2005; Gold *et al*., 2001; Lin, 2007; Lin and Lee, 2005) do not make a distinction between the processes of knowledge application and knowledge storage/retrieval. In this vein, many terms have been used to describe the process of knowledge application: knowledge leverage (Ipe, 2003); knowledge use (Earl, 2001; Swan *et al*., 1999); and knowledge utilization (Chan Lee *et al*., 2005; Jantunen, 2005). One of the most common ways to use knowledge is to adopt the best practices of a leader firm, to identify the relevant knowledge and to apply it (Chang Lee *et al*., 2005). The application of knowledge implies the use of the knowledge generated in the knowledge creation phase and retained in the phases of transfer and storage/retrieval.

From the points set out above, it is clear that there is some confusion between "the process of knowledge application" and "process of applying knowledge". Although there is a significant overlap between the concepts of knowledge application and applying knowledge, the terms refer to two processes that are not identical. While knowledge application is a KM process about being good at transferring knowledge from one context to another (Gold *et al.*, 2001), applying the knowledge learned in a new context may provide organizations with prompts to improve efficiency (Senge, 1990). Thus, while knowledge application is the capability to take effective action, applying knowledge is the effective action in business, which may involve many intricate issues. In this paper, the process that the authors focus on is termed "knowledge application", which is one way to apply learned knowledge to new understandings and situations in order to create the perception among customers that the company's version of its product or service is somehow different and thus has added value that is not available from competitors (Alavi and Leidner, 2001).

3. Research model and hypotheses

Practitioners have long recognized that the essential elements of a firm's business strategy consist of being able to understand what customers value within a particular offering, creating value for them, and then managing this value over time (Porter, 1985; Slater and Narver, 1998). Being able to identify what customers want from a product or service also helps a firm to formulate its value proposition. Porter (1985) notes that a firm's competitive advantage stems from its ability to create value for customers that exceeds the cost of creating that value (DeSarbo *et al*., 2001).

While creating a superior value for customers has always been an important issue for firms (Darroch *et al*., 2009; Drucker, 1954), in the 1990s customer value became a topic of increasing interest for firms and academics, and practitioners now view the concept as one of the most significant factors in a firm's success (Parasuraman, 1997; Woodruff, 1997). Many authors identify customer value as an important source of competitive advantage (Mizik and Jacobson, 2003; Spiteri and Dion, 2004; Woodruff, 1997) and as the foundation of a firm's marketing activities (Holbrook, 1996). Other authors consider customer value to be a critical strategic tool for attracting and retaining customers (Lee and Overby, 2004; Sánchez and Iniesta, 2006; Wang *et al*., 2004) and an indicator of repurchase intentions (Parasuraman and Grewal, 2000).

Over the last few decades, firms have found themselves in a new and complex competitive environment, in which customers increasingly seek customer value (Sánchez *et al*., 2009). The literature discusses at some length this growing interest in the creation and provision of superior customer value (Smith and Colgate, 2007; Wang *et al*., 2004) by partially replacing more limited concepts such as quality (Cronin *et al*., 2000) or satisfaction (Woodruff, 1997).

The knowledge-based view (KBV) identifies value creation as a significant organizational capability that can contribute to a firm's success and as an important source of competitive advantage (Mizik and Jacobson, 2003; Mocciaro and Battista, 2005; Spiteri and Dion, 2004). Customer value is created when a firm is able to use its resources to achieve a desired aim (Amit and Schoemaker, 1993) and this study demonstrates that a firm's ability to create superior customer value depends on a particular combination of its knowledge structures. In the current turbulent environment, customer value in organizations depends upon the organization's ability to have the right people with the right knowledge in the right place at the right time (e.g. Gebert *et al*., 2003; Kaplan and Norton, 2004). In fact, many authors describe KM as a bundle of structures that firms need to have in place to enable them to use what they know in order to create value for their customers (Vorakulpipat and Rezgui, 2008).

Absorptive capacity provides a suitable basis for explaining the adoption of new knowledge structures (Cohen and Levinthal, 1990). It has been suggested in several studies that absorptive capacity can enable firms to acquire external knowledge, as it helps them not only to understand their customers better, but also to learn what their customers know (Tsai, 2001). Although most studies in the area of absorptive capacity emphasize that RACAP is driven by PACAP (e.g. Cohen and Levinthal, 1990; Zahra and George, 2002), the existing literature has paid little attention to how RACAP is created and developed in the company. Internal knowledge structures play an important role in the creation of RACAP by providing a means of transferring knowledge that will refine the organization's existing knowledge and improve its RACAP (Cepeda *et al*., 2012).

The considerations discussed above allow us to put forward the argument that internal knowledge processes play an important role in the creation of RACAP since they provide a means of refining the organization's existing knowledge structures. For

example, knowledge transfer may help employees to solve problems by applying the same kind of thinking across all points of interaction. In addition, knowledge storage/retrieval facilitates a situation that, when something has already been learned, can easily be used again to solve a similar problem. It is with this in mind that the authors propose the use of knowledge transfer and knowledge storage/retrieval as ways of improving RACAP of organizations. What the firm knows will be available for people throughout the firm and will be stored in their memories (Daghfous *et al*., 2013; Dunham and Burt, 2011). Put another way, once knowledge is acquired and assimilated, and has been stored in an implicit or explicit way, the next step must be the transformation and exploitation of this knowledge; that is, firms need to leverage the knowledge that has been absorbed. It is important for firms to develop a 'potential absorptive capacity' because it refers to the ability to use prior knowledge to recognize the value of new information, assimilate it and apply it to create new knowledge and capabilities (Cohen and Levinthal, 1990). This consideration allows us to propose the hypotheses:

Hypothesis 1: Knowledge transfer and knowledge storage/retrieval are mediator variables between PACAP and RACAP.

The application of knowledge implies the use of the knowledge generated via RACAP. In this regard authors have argued that RACAP facilitates the easy search and retrieval of relevant knowledge from its repositories, and enables the stakeholders to apply this knowledge in their decision-making (David, 1999). A possible explanation would be the fact that in customer-seller relationships, employees who interact with customers can use RACAP as information filters, becoming better at separating relevant and irrelevant information (Tippins and Sohi, 2003). These circumstances enable the application of knowledge to continue in times of crisis, such as the Spanish banking industry during the period the authors have examined. Therefore, the authors propose the hypothesis:

Hypothesis 2: RACAP positively influences knowledge application.

These considerations lead us to argue that knowledge application plays an important role in the creation of customer value since it represents the capability of applying appropriated knowledge to refine the existing services offered by the organization and to improve its customer value (Bierly *et al*., 2009). The application of knowledge means that when something is being done wrong, the organization can change the situation to resolve it quickly (Fahey *et al*., 2001; Reichheld and Schefter, 2000; Winer, 2001), which in turn may help employees to coordinate customer relations across all points of interaction and audiences (Chang, 2007; Day, 2000). These circumstances provide a common space of trust between the client and the organization, making it more likely for customers to be able to restore their confidence (Cabrera and Cabrera, 2002; Stein and Bowen, 2003). Thus, as Kotler (2000) noted, when information or knowledge is not fragmented within a company, customer feedback (and, by extension, customer value) is easy to obtain. Therefore, the authors propose the following hypothesis:

Hypothesis 3: Knowledge application positively influences customer value creation.

Taking into account all of the above, this study proposes the structural model shown in Figure 1. In summary, a firm with KM possesses a key capability for the creation of customer value. To manage knowledge effectively, firms must put in place an organizational culture that encourages KM. And for KM to impact on customer value creation, the relationship between the different KM structures must be configured in the way the authors of this study have stated. Finally, firms will actually be able to use what they know in order to increase the value created for their customers.

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Insert Figure 1 about here

4. Methodology

4.1 Data Collection

The context for the research hypotheses is the Spanish banking industry, including retail and commercial banks (bancos) and savings banks (cajas de ahorros) that serve the general public, representing around 18% of the national GDP in 2010.

This industry sector is suitable because banking demonstrates KM capabilities. Banking is a very knowledge-intensive industry and therefore an appropriate one in which to identify, analyze and evaluate the different KM processes. The increasingly intense competition within the financial service industry is forcing banks to recognize the need to seek new ways of creating customer value. In addition to the competitiveness of the industry, the relative intangibility of their products/services creates the need to capture and retain customers by offering them something extra (i.e. KM). These aspects demonstrate that the banking industry is an appropriate setting for an investigation of knowledge corridors and processes and their impact on customer value because banking institutions demand intensive use of appropriated knowledge.

The crisis in the financial services industry is highly significant (both now and at the time the study took place). The effect of this crisis has been to force many countries to apply severe measures to reduce the impact on their financial services industry. Numerous banks and insurance company takeovers and capitalizations have taken place, the number of company mergers as a rescue measure has multiplied and crashes have increased. The full extent of this crisis is still unknown, since events have occurred at an unusually high speed, leading to enormous changes within a short time, mainly following the collapse of Lehman Brothers in September 2008.

The massive granting of credit to construction and property development activities is at the heart of the solvency problems within an important part of the Spanish banking system, namely the savings banks (cajas de ahorros), whose weight in the industry, measured by various indicators, was close to 50% (Confederación Española de Cajas de Ahorros, 2011). To tackle the solvency problems, an intensive restructuring process was undertaken in the industry throughout 2011, which has so far produced positive results in terms of reorganization, loss recognition and recapitalization (IBE, 2013). In this context therefore, it can be stated that there is an increased need for banks to become more customer-oriented, with the aim of providing good customer service and satisfaction (Heffernan *et al*., 2008).

It can also be noted that the banking business is very complex and requires intensive use of knowledge resources to operate competitively in the market and satisfy customer needs (Carballo-Cruz, 2001). In banking institutions, staff need appropriate and up-to-date knowledge to face many challenges, including global competition for deposits, loans, underwriting fees, increasing customer demands, shrinking profit margins, and the need to keep up with new technologies (Wright *et al.*, 2009). Furthermore, banks provide services to different categories of customers, which include individuals, associations, businesses and public organizations, each with different service requirements, such as cash saving, money transfer, loans and foreign trade services (Kubo *et al*., 2001).

The total number of banks operating in Spain at the time of the study (2010) was 110; of which 65 were commercial/retail banks and 45 were savings banks. The small

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number of players in the banking industry in Spain could be seen as an advantage as the study is able to examine the whole population rather than a particular sample. Only 85 of the banks met the requirements of the study (i.e. banks serving the general public). Only 40 of the 65 commercial/retail banks qualified. Of the remaining 25 banks, 17 simply bore a corporate name, but were the capital property of other banks, operating from within their offices and eight were investment (not commercial) banks. Therefore, the target group consists of 85 financial bodies, representing around 77% of the total. Questionnaires were sent to the general manager only, at the main office of each financial entity.

The response rate was high, at around 90%, with 76 of the 85 banks completing the questionnaire by personal interview with the general manager in the main office. Of note is that all of the completed questionnaires are valid. Furthermore, because the data sample (76) is very close to the real population in Spanish banking industry (85), the authors used the factor correction suggested by Malhotra and Birks (2006) to adapt the standard error generated.

4.2 Measures

From the literature review, four key dimensions stand out as affecting KM processes: knowledge creation; knowledge transfer; knowledge storage/retrieval; and knowledge application. Churchill's (1979) approach to questionnaire development was used, combining scales from several other relevant empirical studies.

The survey was initially validated by management academics in Seville (Spain). The authors then conducted a series of personal interviews with a pilot sample group consisting of the managers of 15 firms in various industries. As a result of this pre-testing, the authors made some minor modifications based on the suggestions of this pilot group.

The authors have opted for an absorptive capacity (AC) scale proposed by Jansen *et al*. (2005) to measure knowledge creation, which adds to the conceptual richness of the study. This scale consists of nine items to measure PACAP and 12 items to measure RACAP (see Appendix 1). The final cleaned scale consists of nine items to measure PACAP and eight items to measure RACAP.

The model uses Gold *et al*.'s (2001) scales to measure knowledge transfer (KT) and knowledge application (KA). The KT scale consists of 10 items and the KA scale consists of 12 items (see Appendix 1). After cleaning the data, KT scale includes seven items and KA scale includes nine items.

To measure knowledge storage/retrieval, the authors use Chou *et al*.'s (2007) scale, which consists of four items and measures organizational memory (OM). Organizational memory refers to the processing of saved knowledge, a concept that matches the authors' understanding of knowledge storage and retrieval (see Appendix 1). The final cleaned scale retains the four items.

In the case of the customer value creation capability, and after a review of the scales developed in previous investigations, the authors chose Hooley *et al*.'s (2005) scale. The lack of proposals for measuring customer value creation created problems in choosing the most appropriate instrument for this construct. The model uses Hooley *et al*.'s (2005) scale because it is complete and refers to the creation of value for customers, as opposed to other proposals, which analyze value creation for all the stakeholders (see Appendix 1).

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4.3 Data Analysis

The hypotheses were tested simultaneously using partial least squares (PLS), a structural equation modeling technique employing a principal component-based estimation approach (Chin, 1998). PLS was selected because of the characteristics of the model and sample. The model uses reflective and formative indicators and the data is non-normal. Other techniques of structural equation modeling, such as the covariance-based model performed by LISREL or AMOS, cannot be applied in these circumstances (e.g. Diamantopoulos and Winklhofer, 2001).

PLS involves a two-stage approach (Barclay *et al*., 1995). The first step requires the assessment of the measurement model, which allows the relationships between the observable variables and theoretical concepts to be specified. This analysis is performed in relation to the attributes of individual item reliability, construct reliability, average variance extracted (AVE) and discriminant validity of the indicators of latent variables. For the second step, the structural model is evaluated. The objective of this is to confirm the extent to which the causal relationships specified by the proposed model are consistent with the available data.

To analyze the relationships between the different constructs and their indicators, the authors have adopted the latent model perspective, in which the latent variable is understood to be the cause of the indicators and the authors therefore refer to reflective indicators for first-order constructs or dimensions. The model contains four reflective constructs: knowledge transfer; knowledge storage/retrieval; knowledge application; and customer value creation. Two constructs (PACAP and RACAP) are modeled as second-order formative constructs, because the authors consider them "causal" drivers of absorptive capacity rather than seeing the dimensions as outcomes of it (Baxter, 2009).

With regard to the measurement model, the authors began by assessing individual item reliability (Table 1). The indicators exceed the accepted threshold of 0.707 for each factor loading (Carmines and Zeller, 1979).

Insert Table 1 about here

From an examination of the results shown in Table 2, the authors can state that all of the constructs are reliable. The values for both the Cronbach's alpha coefficient and composite reliability are greater than the 0.7 required in the early stages of research and the stricter value of 0.8 for basic research (Nunnally, 1978). The AVE should be greater than 0.5, meaning that 50% or more variance of the indicators should be accounted for (Fornell and Larcker, 1981). All the constructs of the authors' model exceed this condition (Table 2). To assess the discriminant validity, the authors compared the square root of the AVE (the diagonal in Table 2) with the correlations between constructs (the off-diagonal elements in Table 2). On average, each construct relates more strongly to its own measures than to others.

Insert Table 2 about here

The formative dimensions of the second-order constructs, PACAP and RACAP, are evaluated differently from reflective ones. The authors need to examine the weights (Mathieson *et al.*, 2001), which is a canonical correlation analysis and provides information about how each indicator contributes to its respective construct (see Table 3).

Insert Table 3 about here

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5. Results

A bootstrap test (5,000 resamples) was used to generate standard errors and t-statistics (Hair *et al*., 2011; Hair *et al*., 2014; Henseler *et al*., 2009). This enabled us to assess the statistical significance of the path coefficients. Table 4 sets out the model statistics, the path coefficients and the t-values observed with the level of significance obtained from the bootstrap test.

Insert Table 4 about here

Adopting the approach used by Tippins and Sohi (2003), the authors checked for the presence of a mediating effect by comparing the direct effect between variables and the competing links where the mediated variable occurs. To be precise, the direct effect examined the direct relationship between PACAP and RACAP (see Figure 2); the proposed research model examined the partial mediated model from Figure 1 with 'knowledge transfer' and 'knowledge storage/retrieval' acting as mediators.

Insert Figure 2 about here

Table 4 shows the results of the two competing links. The results of the two mediation links support the hypotheses. First, the partial mediation model explains more variance in RACAP than the direct effect model (0.81 vs. 0.67). Second, positive relationships exist between PACAP and knowledge transfer ($\beta = 0.783$, $p < 0.001$) and knowledge storage/retrieval ($\beta = 0.700$, $p < 0.001$); and between knowledge transfer ($\beta = 0.236$, $p < 0.05$) and knowledge storage/retrieval ($\beta = 0.414$, $p < 0.001$) and RACAP. Third, the significant relationship between PACAP and RACAP in the direct effect model ($\beta = 0.819$, $p < 0.001$) is reduced in the partial mediation model ($\beta = 0.341$, $p < 0.001$). Together these three points provide evidence that there is a discernible mediating effect of knowledge transfer and knowledge storage/retrieval, and that the partial mediation model represents a significant improvement over the direct effect model. The partial mediation model explains a good amount of the variance of the RACAP ($R^2 = 0.81$). The authors also estimate the F^2 ratio suggested by Chin (1998), to provide the level of significance of the improvement. When F^2 is greater than 0.02, the improvement is significant. In this case F^2 was 0.71.

The authors' model has more than one mediator, and Chin (2010) has suggested an alternative way to guarantee that the indirect effect of 0.18 (0.78*0.23) for knowledge transfer on RACAP and the indirect effect of 0.29 (0.70*0.41) for knowledge storage/retrieval on RACAP are significant. As Chin (2010) recommends, the significance of an indirect path in a PLS structural model should be assessed by carrying out a new bootstrap with 1,000 sub-samples to calculate the product of the direct effect and then the significance estimated, using either a percentile bootstrap or bias-corrected bootstrap (Preacher and Hayes, 2008). This method has been shown to have the least biased confidence intervals, greatest power to detect non-zero effects and contracts, and the most accurate overall Type I error (Williams and MacKinnon, 2008). The following table (Table 5) summarizes the results of the test in this case, using a bias-corrected bootstrap.

Insert Table 5 about here

The test shown in Table 5 includes an examination of the total effect and direct effect of PACAP on RACAP. The difference between these is the indirect effect of PACAP on RACAP through mediators. The analysis also yields an estimation of the indirect effect of each mediator. In addition, the bias-corrected bootstrap generates a 95 percent

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confidence interval for each indicator. Where the interval for a mediator does not contain zero, it means the indirect effect of this mediator is significantly different from zero. Furthermore, a comparison of the two mediators shows how their indirect effects can be distinguished in terms of magnitude (Chin, 2010). In this case, all indirect effects are significant and can be distinguished in terms of magnitude. In summary, the analysis shows that knowledge transfer and knowledge storage/retrieval mediate the impact of PACAP on RACAP.

6. Discussion

The first contribution of this research is to extend the body of understanding within the knowledge-based view (KBV) theory. KBV theory views a knowledge corridor as a path consisting of a series of steps during which a message, the "external knowledge", is conveyed from a source or sender to a receiver, "a firm which absorbs external knowledge". In the context of this research, a firm's absorptive capacity indicates its potential and actual capability for processing external knowledge. In this regard, the relationship between the "stickiness" of internal knowledge processes and a firm's absorptive capacity has only been dealt with by a few empirical studies, conducted in developed countries (e.g. Waalkens *et al*., 2008). This study has examined two key corridors of the learning process (PACAP and RACAP) and their effects on 'knowledge application'. The study has also investigated how RACAP can promote the application of knowledge and the creation of customer value through an empirical study of 76 commercial and saving banks in Spain. The excellent fit of this partial mediation model is a theoretically important finding since it means that determinants of the RACAP of banks can be grouped into two main categories: internal and external factors.

The second contribution of this research is derived from the results of the empirical testing of the hypotheses. The managerial implications of the relationships observed between the factors that constitute the hypothesized relationships are discussed in more detail in below.

The first hypothesis analyses the relationship between PACAP and RACAP. A null proposition (that the transference and storage/retrieval of knowledge are mediator variables between PACAP and RACAP) was tested against the alternative proposition (that the transference and storage/retrieval of knowledge are unnecessary in the creation of the RACAP). The data analysis provides empirical support for this mediation model of the effects of transference and storage/retrieval of knowledge. The results of the three links support a theoretically important finding since they show that knowledge transfer and knowledge storage/retrieval are mediator variables between PACAP and RACAP. The authors of this study believe that this is an important finding, as the potential for any firm to develop will depend substantially on its ability to maintain an appropriate balance between PACAP and RACAP (e.g. Cepeda *et al.*, 2012). This is in broad agreement with the conclusions of authors such as Leal and Roldan (2010), who assert that acquiring and assimilating knowledge may occur but this does not guarantee that it will be transformed and exploited efficiently. As Lee and Wu (2010) note, knowledge alone is not enough, it must also be applied.

A possible explanation for the above findings may relate to the advantages and disadvantages of the knowledge types that are highlighted as a result of their different structural properties. PACAP entails acquisition and assimilation and makes a firm receptive to acquiring and assimilating external knowledge, whereas RACAP involves transformation and exploitation capabilities and makes a firm receptive to using and exploiting knowledge (Zahra and George, 2002). Complementing these authors' argument, the authors of this paper propose that knowledge transfer and knowledge storage/retrieval processes may help to reduce the gap between PACAP and RACAP.

On one hand, the knowledge transfer process renders knowledge easier to understand (Ipe, 2003) and communicate (Gold *et al.*, 2001), while on the other hand, the knowledge storage/retrieval process protects knowledge from being lost or erased (Darr *et al.*, 1995; Nilakanta *et al.*, 2006) and makes it easier to access (Argote *et al.*, 2003; Levy, 2011). Managers therefore need to be aware of the roles of knowledge transfer and knowledge storage/retrieval in order to close the knowledge gap between PACAP and RACAP.

The second hypothesis stresses that an organization's RACAP fosters knowledge application by providing new knowledge (*RACAP → knowledge application*). The results also support this hypothesis, indicating that RACAP can be viewed as an important organizational capacity that will encourage the application of new techniques and knowledge structures (as perhaps would be expected). These findings support the views of previous researchers, who draw attention to the fact that the existence of particular work environment characteristics might facilitate and encourage knowledge application (e.g. Al-Alawi *et al.*, 2007; Chang Lee *et al.*, 2005). Put another way, RACAP encourages the challenging of accepted assumptions, values and norms as a prior step to considering whether anything can be applied or used (Alavi and Leidner, 2001; Jantunen, 2005). Therefore, by recognizing knowledge application as a subsequent stage of RACAP, it enables a bank to refine and optimize its sales initiatives, which in turn could lead to the conclusion that most –but not all– of the external knowledge that a bank has created is relevant.

With regard to the testing of the third hypothesis, the results support the proposition that knowledge application positively influences customer value (*knowledge application → customer value*). This is the outcome described by authors such as Stein and Bowen (2003) when they refer to the application of knowledge as a basic process that the organization can use to transform corporative knowledge into 'customer value'. A possible explanation for these findings may lie in the fact that by applying knowledge, managers have some control over customer relations. For example, a thorough understanding of customer types and interaction strategies appears to provide bank managers with a useful way of helping customers to deal with problems by exhibiting customer-oriented behavior (Agnihotri *et al.*, 2009). It may also be noted that the recognition of the wide range of customer categories and the services offered by banks might increase the importance of knowledge application processes when they are recommending financial products and related services as well as when identifying solutions to deal with customers' demands (Wright *et al.*, 2009).

The considerations above imply that, if banks apply knowledge correctly, employees have the potential to experiment and learn new process and practices, which in turn will strengthen customer value (e.g. public opinion about a firm or its brand). These findings draw bank managers' attention to a wide range of practices that they might adopt to improve customer value. For example, a process such as a self-evaluation program might help bank customers to perceive the relationship as worthwhile, equitable and productive (Alavi and Leidner, 2001). By adopting appropriate knowledge structures, a customer's interpretation of events can be fostered by the bank, and might even be widely enhanced, as the organization adopts new critical norms and routines and thereby consolidates new understandings (Chang Lee *et al.*, 2005).

7. Conclusions

The Spanish banking industry is facing its worst crisis of the past fifty years and thousands of jobs have been lost. Within this framework, Spanish banks that took rescue packages are trying to find innovative ways of improving customer value. In doing so, the KBV provides insight into why firms exist (and will continue to exist), and

thus why organizing knowledge is a critical part of what firms do (Brown and Duguid, 1998). In this regard, this study has shed more light on the situation within this field of the Spanish banking industry.

Based on these findings, it is worth noting the importance of the transference/storage of knowledge for limiting or removing the hidden risks of a significant loss of knowledge in a turbulent context, such as that experienced by the Spanish banking industry during the period the authors have examined, and the authors would also highlight how RACAP functions under different relationship conditions. In this study, the authors suggest that in order to maintain RACAP and thereby enhance knowledge application, banks need to provide and support RACAP though knowledge transference and storage. The contribution of these internal processes is therefore related to its ability to prepare the ground for creating social knowledge and new knowledge structures. Once individual knowledge is transformed into social knowledge, it assumes the nature of 'public goods', which can be easily accessible and disseminated to anyone who wants to use it (Cabrera and Cabrera, 2002).

This study is not without limitations and, consequently, any conclusion cannot be generalizable. Firstly, although the banking industry clearly falls within the category of services, it might not be representative of all services because of the types of products and services it provides. Secondly, national cultural issues might influence the way in which organizations learn. Thirdly, the authors are only able to provide a snapshot of ongoing processes rather than measuring the same process over time. Another limitation of this study concerns the measurement approach. Although the constructs have been defined as precisely as possible by drawing on relevant literature and have been validated by practitioners, realistically they can only be seen as proxies for an underlying latent phenomenon that is not fully measurable. Moreover, other factors that have not been included in this study are also likely to affect knowledge corridors in the creation of customer value.

With these limitations in mind, this study indicates the need for new avenues of research. Firstly, the authors consider that the use of control variables (e.g. career, income or age) might help to capture this rich construct more fully. It might help to ensure, for example, that the effects of knowledge corridors on the achievement of the population sample are independent of the user's focus on their achievement. Secondly, depending on the knowledge corridors used by the company, some internal knowledge structures will be more successful than others and the authors therefore propose a complementary study of the internal knowledge structures (e.g. relationship memory) that a company uses for storing the knowledge provided by external agents. Thirdly, this paper suggests that a longitudinal research may be needed to examine the relationships between knowledge corridors (PACAP and RACAP), and the ways in which they affect customer value.

The key managerial implication of this paper is that the long-term survival and success of an organization requires the firm and its managers to meet the challenge of closing the knowledge gap between PACAP and RACAP. A possible explanation for this gap may be that since much of the knowledge created as a consequence of the PACAP among bank employees is of an individual nature, it needs to be converted to social knowledge before applying it in order to create customer value. Otherwise, bank employees will be confronted with more non-structured information, that is to say, they will spend considerable time and effort on finding new routines and procedures (RACAP), which will have a negative effect on the decision-making rules that govern the behavior of individuals and teams within the organization. The processes that mitigate the knowledge gap between PACAP and RACAP are those that support what the authors have termed in this paper knowledge transfer and knowledge

storage/retrieval. This insight is seen to be even more relevant considering that many Spanish banks are currently experiencing significant cuts in their budgets. Bank managers might be considered to be over-investing in the development of organizational characteristics such as task autonomy, task significance, task identity, skill variety and supervisory feedback, rather than investing in mechanisms that will facilitate knowledge transfer and knowledge storage/retrieval. If this is the case, this paper can help bank managers to select the appropriate knowledge structures to reduce the gap between PACAP and RACAP.

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Appendix 1. Questionnaire items

PACAP (1=strongly disagree and 7=strongly agree).

Acquisition

ACQ_1: Our unit has frequent interactions with corporate headquarters to acquire new knowledge

ACQ_2: Employees of our unit regularly visit other branches

ACQ_3: We collect industry information through informal means (e.g. lunch with industry friends, talks with trade partners)

ACQ_4: Other divisions of our company are rarely visited (reverse-coded)

ACQ_5: Our unit periodically organizes special meetings with customers or third parties to acquire new knowledge

ACQ_6: Employees regularly approach third parties such as accountants, consultants, or tax consultants

Assimilation

ASS_1: We are slow to recognize shifts in our market (e.g. competition, regulation, demography) (reverse-coded)

ASS_2: New opportunities to serve our clients are quickly understood

ASS_3: We quickly analyze and interpret changing market demands

RACAP (1=strongly disagree and 7=strongly agree)

Transformation

TRA_1: Our unit regularly considers the consequences of changing market demands in terms of new products and services

TRA_2: Employees record and store newly acquired knowledge for future reference

TRA_3: Our unit quickly recognizes the usefulness of new external knowledge to existing knowledge

TRA_4: Employees rarely share practical experiences (reverse-coded)

TRA_5: We find it hard to understand the opportunities for our unit from new external knowledge (reverse-coded)

TRA_6: Our unit periodically meets to discuss consequences of market trends and new product development

Exploitation

EXP_1: It is clearly understood how activities within our unit should be performed

EXP_2: Client complaints fall on deaf ears in our unit (reverse-coded)

EXP_3: Our unit has a clear division of roles and responsibilities

EXP_4: We constantly consider how to better exploit knowledge

EXP_5: Our unit has difficulty implementing new products and services (reverse-coded)

EXP_6: Employees have a common language regarding our products and services

Knowledge transfer (1=strongly disagree and 7=strongly agree)

KT_1: My organization has processes for converting knowledge into the design of new services

KT_2: My organization has processes for converting competitive intelligence into plans of action

KT_3: My organization has processes for filtering knowledge

KT_4: My organization has processes for transferring organizational knowledge to individuals

KT_5: My organization has processes for absorbing knowledge from individuals into the organization

KT_6: My organization has processes for absorbing knowledge from business partners into the organization

KT_7: My organization has processes for distributing knowledge throughout the organization

KT_8: My organization has processes for integrating different sources and types of knowledge

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KT_9: My organization has processes for organizing knowledge
KT_10: My organization has processes for replacing outdated knowledge
Knowledge storage and retrieval (1=strongly disagree and 7=strongly agree).
OM_1: Organizational conversation keeps the lessons learned from service development history at the front of our minds
OM_2: We always audit unsuccessful service development endeavors and communicate the lessons learned
OM_3: We have specific mechanisms for sharing lessons learned in the service development process
OM_4: Formal routines exist to uncover faulty assumptions about the service development process
Knowledge application (1=strongly disagree and 7=strongly agree).
KA_1: My organization has processes for applying knowledge learned from mistakes
KA_2: My organization has processes for applying knowledge learned from experiences
KA_3: My organization has processes for using knowledge in the development of new services
KA_4: My organization has processes for using knowledge to solve problems
KA_5: My organization matches sources of knowledge to problems and challenges
KA_6: My organization uses knowledge to improve efficiency
KA_7: My organization uses knowledge to adjust its strategic direction
KA_8: My organization is able to locate and apply knowledge to changing competitive conditions
KA_9: My organization makes knowledge accessible to those who need it
KA_10: My organization takes advantage of new knowledge
KA_11: My organization quickly applies knowledge to critical competitive needs
KA_12: My organization quickly links sources of knowledge for resolving problems
Customer value creation (1=much lower and 7=much higher).
CV_1: Levels of customer loyalty compared to competitors
CV_2: Levels of customer satisfaction compared to last year
CV_3: Levels of customer loyalty compared to last year

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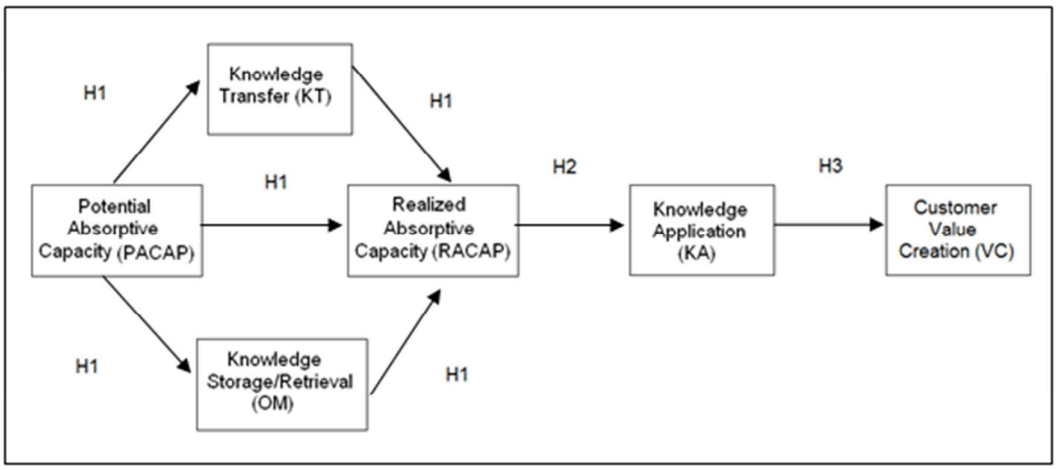

Figure 1: Knowledge management processes

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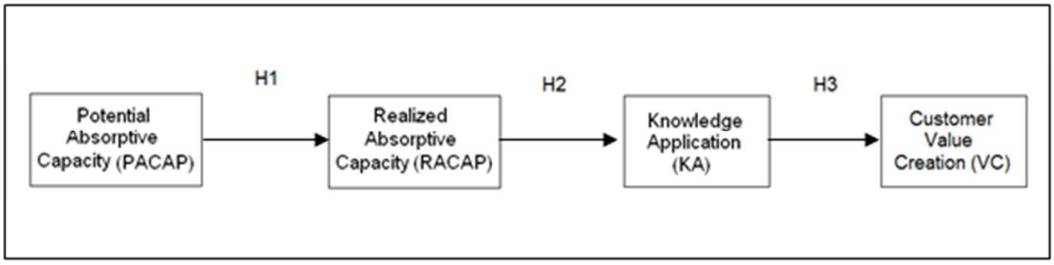

Figure 2: Alternative Model

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Table 1: Factor loadings for the measurement model

	Acquisition	Assimilation	Transformation	Exploitation	Knowledge Transfer	Knowledge Storage/retrieval	Knowledge Application	Value Creation
ACQ1	**0,805**	0,423	0,580	0,539	0,628	0,488	0,651	0,393
ACQ2	**0,706**	0,194	0,474	0,290	0,343	0,297	0,341	0,130
ACQ3	**0,768**	0,116	0,480	0,342	0,367	0,283	0,410	0,024
ACQ4	**0,724**	0,350	0,204	0,142	0,167	0,173	0,279	0,149
ACQ5	**0,731**	0,332	0,495	0,533	0,457	0,417	0,395	0,223
ACQ6	**0,708**	0,232	0,499	0,384	0,439	0,345	0,420	0,091
ASS1	0,293	**0,788**	0,450	0,330	0,439	0,509	0,496	0,334
ASS2	0,458	**0,908**	0,623	0,675	0,656	0,637	0,628	0,364
ASS3	0,292	**0,908**	0,580	0,520	0,522	0,547	0,509	0,304
TRA1	0,570	0,499	**0,764**	0,508	0,659	0,567	0,605	0,260
TRA2	0,438	0,381	**0,719**	0,538	0,479	0,495	0,482	0,124
TRA3	0,530	0,580	**0,808**	0,526	0,516	0,672	0,585	0,271
TRA6	0,526	0,444	**0,795**	0,577	0,484	0,560	0,486	0,140
EXP1	0,505	0,515	0,598	**0,836**	0,564	0,624	0,560	0,392
EXP4	0,442	0,478	0,616	**0,848**	0,712	0,713	0,700	0,235
EXP5	0,413	0,476	0,530	**0,724**	0,486	0,542	0,516	0,241
EXP6	0,457	0,403	0,498	**0,712**	0,436	0,435	0,476	0,303
KT1	0,511	0,566	0,708	0,669	**0,842**	0,659	0,741	0,309
KT2	0,509	0,541	0,640	0,560	**0,855**	0,595	0,730	0,423
KT3	0,540	0,550	0,634	0,678	**0,895**	0,608	0,756	0,340
KT4	0,500	0,462	0,482	0,569	**0,780**	0,531	0,722	0,375
KT7	0,533	0,520	0,547	0,611	**0,813**	0,583	0,658	0,385
KT8	0,465	0,531	0,529	0,540	**0,815**	0,617	0,730	0,324
KT9	0,594	0,514	0,643	0,538	**0,876**	0,571	0,681	0,188
OM1	0,477	0,657	0,700	0,671	0,713	**0,848**	0,670	0,402
OM2	0,406	0,515	0,614	0,662	0,539	**0,851**	0,621	0,365
OM3	0,514	0,527	0,706	0,600	0,612	**0,875**	0,667	0,290
OM4	0,361	0,537	0,620	0,641	0,563	**0,870**	0,632	0,306
KA1	0,409	0,380	0,536	0,530	0,575	0,518	**0,788**	0,232
KA2	0,478	0,565	0,624	0,583	0,690	0,582	**0,863**	0,315
KA3	0,583	0,603	0,694	0,652	0,699	0,649	**0,908**	0,331
KA4	0,588	0,697	0,691	0,643	0,702	0,705	**0,884**	0,344
KA5	0,418	0,531	0,523	0,651	0,692	0,581	**0,796**	0,252
KA6	0,608	0,386	0,569	0,573	0,707	0,586	**0,811**	0,306
KA7	0,588	0,462	0,570	0,474	0,680	0,607	**0,771**	0,341
KA10	0,506	0,508	0,553	0,650	0,718	0,695	**0,838**	0,364
KA11	0,539	0,535	0,630	0,652	0,697	0,698	**0,817**	0,286
VC1	0,221	0,381	0,284	0,303	0,357	0,377	0,318	**0,800**
VC2	0,275	0,272	0,170	0,338	0,339	0,319	0,332	**0,867**
VC3	0,189	0,335	0,236	0,317	0,321	0,325	0,302	**0,901**

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Table 2: Descriptive statistics and correlation matrix

	Mean[a]	SD	CA	CR	AVE	1	2	3	4	5	6
1. PACAP	5,01	1,27	n.a	n.a	n.a	**n.a**					
2. RACAP	5,57	1,05	n.a	n.a	n.a	0,81	n.a				
3. Knowledge Transfer	5,38	1,14	0,94	0,94	0,70	0,78	0,80	**0,84**			
4. Knowledge Storage/retrieval	5,16	1,12	0,88	0,92	0,74	0,70	0,82	0,72	**0,86**		
5. Knowledge Application	5,47	1,09	0,93	0,95	0,69	0,76	0,79	0,80	0,76	**0,83**	
6. Value Creation	5,24	1,21	0,82	0,89	0,73	0,39	0,34	0,37	0,39	0,39	**0,85**

Notes:
[a] Mean = the average score for all of the items included in this measure; SD. = Standard Deviation; CA = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted; n.a. = not applicable. The bold numbers on the diagonal are the square root of the Average Variance Extracted. Off-diagonal elements are correlations among constructs.

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Table 3: Weights of formative constructs

High-order constructs and their dimensions (level)	weights	Student t
Potential Absorptive Capacity (second-order)		
Acquisition (first-order)	0,58	6,14
Assimilation (first-order)	0,62	7,06
Realized Absorptive Capacity (second-order)		
Transformation (first-order)	0,60	7,01
Exploitation (first-order)	0,48	5,18

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Table 4: Model statistics

Hypotheses	Path coefficients	t-values[a]	R^2	ΔR^2	F^2
H1: PACAP → RACAP (direct effect)	0,819***	65,66	0,67		
H1: PACAP → RACAP (mediating effect)	0,341***	10,22	0,81	0,14	0,71
H1: PACAP → Knowledge Transfer (mediating effect)	0,783***	57,80	0,61		
H1: PACAP → Knowledge Storage/retrieval (mediating effect)	0,700***	33,85	0,49		
H1: Knowledge Transfer → RACAP (mediating effect)	0,236***	6,93	0,81		
H1: Knowledge Storage/retrieval → RACAP (mediating effect)	0,414***	13,26	0,81		
H2: RACAP → Knowledge Application	0,797***	55,93	0,64		
H3: Knowledge Application → Value Creation	0,392***	13,32	0,15		

***p <0.001, **p <0.01, *p <0.05, ns: not significant (based on a Student t (4999), one-tailed test).
t(0.05, 4999) = 1.645158499, t(0.01, 4999) = 2.327094067, t(0.001, 4999) = 3.091863446
[a] Factor correction applied.

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Table 5: Test of mediating effects

Total effect of PACAP on RACAP		Direct effect of PACAP on RACAP				Indirect effects		
Coefficient	T value	Coefficient	T value			Point Estimate	BC 95% Confidence Interval	
							Lower	Upper
0.82***	21.8	0.34***	3.30		Total	0.47	0.32	0.66
				Mediators	Knowledge Transfer	0.18	0.02	0.35
					Knowledge Storage/retrieval	0.29	0.16	0.45

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, ns: not significant (based on Student t (4999), one-tailed test).
t(0.05, 4999) = 1.645158499, t(0.01, 4999) = 2.327094067, t(0.001, 4999) = 3.091863446

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