OPEN INNOVATION, ORGANIZATIONAL LEARNING CAPABILITY AND ORGANIZATIONAL PERFORMANCE: AN ANALYSIS OF THE INTERMEDIATE PROCESSES

Purpose/Objectives

A principal concern articulated in strategic management research is to understand reasons for performance differences among firms (Nelson, 1991). The resource-based view of the firm offers an explanation for this phenomenon: the possession of unique organizational resources implies that some firms outperform others and, therefore, represent the main source of sustainable competitive advantage. Currently, this explanation is being complemented by taking into account the role of open innovation, organizational learning and dynamic capabilities in achieving such sustainability.

Firms rarely innovate alone and increasingly look to users, suppliers, universities, technology agencies, and even competitors for new ideas (Chen et al., 2011). This open behavior helps firms in their search for innovative opportunities and represents one of the reasons for performance differences among firms. However, in order to integrate the new incorporated knowledge with existing and successfully apply it commercially, firms may need a certain level of learning ability (Cohen and Levinthal, 1990). Furthermore, moving from closed to open innovation requires changes in corporate culture and organizational structure (Chiaroni et al., 2011).

Recent research has shown a positive link between organizational learning capability and organizational performance, either focusing on general performance (Camps and Luna-Arocas, 2012) or on specific organizational performance aspects like innovation performance (Ar and Baki, 2011; Robinson and Stubberud, 2011) or export performance (Alegre et al., 2011). Following Zollo and Winter (2002) and Easterby-Smith and Prieto (2008), we argue that both, organizational learning processes and dynamic capabilities, represent intermediate steps between organizational learning capability and organizational performance. However, a wider focus that takes into account the impact of organizational learning capability on organizational performance examining the intermediate processes and capabilities between these two concepts and considering the main dimensions of organizational performance is still missing from extant literature.

In this study, we aim to contribute to literature on open innovation and organizational learning capability in three ways. First, we extend Laursen and Salter (2006), and Chen et al., (2011) analysis of external search strategies and firm innovative performance by considering absorptive capacity as an intermediate process.
Second, we propose an integrative model which considers absorptive capacity and dynamic capability as intermediate processes between organizational learning capability and firm performance.

Third, we analyze empirically the connections detailed above assessing their contributions to organizational performance, and derive practical implications useful for policy-makers and managers wishing to improve business competitiveness on the basis of innovation/technology driven productivity enhancement and high value-added product/service development.

**Background and main relationships explored**

**Organizational learning capability**

During the past years, learning has become an important subject in organizational contexts. Among the main reasons for this growing importance are the rapidly changing environment and the need for innovation. Organizational learning capability (DiBella et al., 1996; Goh and Richards, 1997; Hult and Ferrell, 1997; Yeung et al., 1999; Jerez-Gómez, 2005; Alegre and Chiva, 2008) emphasizes the importance of the facilitating factors for organizational learning or the organizational propensity to learn. We consider organizational learning capability as the organizational and managerial characteristics that facilitate the organizational learning process or allow an organization to learn and thus develop a learning organization. Organizational learning is generally defined as a process (Sun, 2003; p. 160; Balbastre et al., 2003, p. 253) and a learning organization is defined via the existence of organizational conditions that favour learning per se (Lähteenmäki et al., 2001, p. 114).

The capacity to learn has been considered a key index of an organization’s effectiveness and potential to innovate and grow (Jerez-Gómez et al., 2005, p. 279). Consequently, organizations and academics have increasingly focused on enhancing organizational learning capability and building a learning organization.

However, despite the importance of the subject, widespread controversy, confusion and theoretical disarray are still in evidence as a consequence of the natural evolutionary process of such a complex dynamic concept. A range of studies on organizational learning (Easterby-Smith et al., 2000; Lyles and Easterby-Smith, 2003) have pointed out these deficiencies and proposed for future research the conceptualization and development of a valid reliable measurement instrument for organizational learning.

The learning organization or prescriptive literature mainly focuses on the development of normative models for the creation of a learning organization (Chiva and Alegre,
This literature (Ulrich et al., 1993; Goh and Richards, 1997; Pedler et al., 1997) describes a set of actions that ensures learning capability: effective generation of ideas by implementing a set of practices such as experimentation, continuous improvement, teamwork and group problem-solving, observing what others do, or participative decision making.

Although most of the organizational learning capability measurement proposals and analyses of their dimensions have mainly focused on the learning organization research, the broader organizational learning literature has also studied the organizational learning facilitating factors. Chiva (2004) analyzes both literatures in order to determine the facilitating factors of organizational learning. Based on this comprehensive analysis, Alegre and Chiva (2008) developed an organizational learning capability measurement instrument that understanding it as a multidimensional concept, the dimensions of which were: experimentation, risk taking, interaction with the external environment, dialogue and participative decision making. On the one hand, these five dimensions are essential enablers of the organizational learning process. On the other hand, they represent the organizational learning capability of a particular firm.

Firm’s Openness behavior

Since Chesbrough published his book on open innovation, the idea that external knowledge is an essential element to optimize in-house innovation has obtained great importance (Chesbrough, 2003). Traditionally, most industrial firms focused on internally developing new technologies and applying them in their own products (March, 1991; Calantone and Stanko, 2007). However these closed innovation strategies have changed because many firms across industries now acquire a considerable volume of their technologies from external sources (Cohen and Levinthal, 1990; Mowery et al., 1998; Tsai et al., 2001).

According to Chesbrough (2003), many innovative firms have shifted to an open innovation model, using a wide range of external actors and sources to help them to achieve and sustain innovation. A central part of the innovation process involves search for new ideas that have commercial potential (Laursen and Salter, 2006). As a result, firms often invest considerable amounts of time, money and other resources in order to increase the ability to create, use and recombine new and existing knowledge. Chesbrough and Crowther (2006) define two types of open innovation that companies may engage in: inbound open innovation and outbound open innovation. In the case of inbound open innovation, companies monitor the environment to source technology and knowledge in addition to in-house R&D. In the case of outbound open innovation,
companies do not only rely on internal paths to market, but also look for external organisations that are better suited to commercialize a given technology.

Key to open innovation is the transparency of the firm’s boundaries to take into account the available knowledge outside the company boundaries (Chesbrough, 2003; Huston and Sakkab, 2006), which has been further explored by looking at the breadth, depth and the orientation of search routines (Spithoven et al., 2011; Chen et al., 2011; Laursen and Salter, 2006). The scope of openness refers to the diversity of types of partners to which the innovating firm has a connection; while the depth of openness reflects the intensity of co-operation with these partners (Laursen and Salter, 2006). The orientation of a firm’s external sourcing strategy will depend of the type of technology or knowledge that the organization is looking for (Chen et al., 2011). In the present study we will focus on inbound open innovation which requires search processes that are supposed to be available within the company.

The intermediate steps between organizational learning capability and organizational performance

Recent research has shown a positive link between organizational learning capability and organizational performance, either focusing on general performance (Camps and Luna-Arocas, 2012) or on specific organizational performance aspects like innovation performance (Ar and Baki, 2011; Robinson and Stubberud, 2011) or export performance (Alegre et al., 2011). However, a wider focus that takes into account the impact of organizational learning capability on organizational performance examining the intermediate processes and capabilities between these two concepts and considering the main dimensions of organizational performance is still missing from extant literature.

Following Zollo and Winter (2002), and Easterby-Smith and Prieto (2008), we identify two main intermediate steps between organizational learning capability and organizational performance: (1) organizational learning processes and (2) dynamic capabilities. Organizational learning and knowledge management processes deal with the creation, retention and transfer of knowledge (Argote et al., 2003; Hult, 2003; Tanriverdi, 2005). Dynamic capabilities arise from learning (Zollo and Winter, 2002; Prieto and Easterby-Smith, 2006; Teece, 2007; Easterby-Smith and Prieto, 2008) since “it represents a learned and stable pattern of collective activity through which the organization systematically generates and modify its operating routines in pursuit of improved effectiveness” (Zollo and Winter, 2002, pp. 340). The repertory of dynamic
capabilities allows the firm to make subsequent changes and adaptations in local practices so that they do not become core rigidities (Leonard-Barton, 1992).

For instance, absorptive capacity has been considered as a dynamic capability which raises from learning (Lane et al., 2006; Lichtenthaler, 2009; Zahra and George, 2002; Easterby-Smith et al., 2008) and provides organizations with the ability to identify, assimilate and exploit external knowledge for commercial end (Cohen y Levinthal, 1990).

Since its introduction, the concept of AC has been associated with notions of organizational learning (OL) (Mowery et al., 1996; Szulanski, 1996; Liao et al., 2007; Schilling, 1998; Tsai, 2001; Lane and Lubatkin, 1998; Lane et al., 2006; Veugelers and Kesteloot, 1996) being established proposals to integrate both concepts as the one suggested by Sun and Anderson (2010), in which they considered the dynamic view of AC as a specific type of OL concerning the relationship between firm and external knowledge. The process based view of absorptive capacity defined it as a firm ability to utilize externally held knowledge through three sequential processes: exploratory, transformative and exploitative learning processes (Lane et al., 2006). Through exploration learning process firms recognize external knowledge and assimilate this knowledge (Arbussà and Coenders, 2007). Exploitative learning process involves transmuting the assimilated knowledge and applying this knowledge (Todorova and Durisin, 2007). Transformative learning process allows organizations to maintain the new assimilated knowledge and reactive the stock of existing knowledge in order to apply it (Lane et al., 2006; Marsh and Stock, 2006).

Recent studies have identified that absorptive capacity has a significant positive effect on innovative performance (Fosfuri and Tribó, 2008; Nieto and Quevedo, 2005; Fabrizio, 2009; Murovec and Prodan, 2009; Koch and Strotmann, 2008; George et al., 2001; Jantunen, 2005) general performance (Tsai, 2001; Lichtenthaler, 2009; Rothaermel and Thursby, 2005; Lane et al., 2001), financial performance (Bergh and Lim, 2008; Zahra and Hayton, 2008; Zhang, 2009) or export performance (Luo, 1997; Francalanci and Morabito, 2008; Harris and Li, 2009; Márquez-Ramos and Martínez-Zarzoso, 2010). As the managerial challenges posed by the three learning processes of AC differ, distinct components of the prior knowledge as well as the organizational conditions that promote learning inside the firm may influence differently the three learning processes of absorptive capacity (Lane et al., 2006; Sun and Anderson, 2010; Jansen et al., 2005; Lichtenthaler, 2009). This effect may also generate interfirm differences in profiting from external knowledge, as a result of not having a uniform level of all learning processes. For instance, Lichtenthaler (2009) showed that the level...
of learning process in a firm likely determines which innovation activities a firm coordinates inside its boundaries. Thus, the learning processes may help to explain the use of different innovation strategies within and across industries (Powell et al., 1996). Furthermore, the three learning process are complementary since exist synergies resulting from their coexistence which may help to explain why some firms performance differently (Lichtenthaler, 2009). Therefore, in the present study we pretend to evaluate how absorptive capacity and the different learning processes that comprise it mediate the relationship between organizational learning capability and organizational performance.

The idea of dynamic capabilities has also been adopted by the functional literature (Esaterby-Smith and Prieto, 2008). Dynamic capabilities on technology management, on product design management, and on marketing management allow the firm to integrate, build and reconfigure internal and external competencies to address rapidly changing environments. As a result, these dynamic capabilities constitute an enduring source of competitive advantage since they allow the creation of unique and continually updated configurations of resources (Kogut & Zander, 1992; Teece et al., 1997).

There are two threads to the literature on functional dynamic capability: first, that functional capability produces the routines which lead to general dynamic capabilities; second, that functional routines and procedures themselves embody dynamic capabilities (Easterby-Smith and Prieto, 2008).

An example of the former can be found in the field of marketing, where firms can introduce processes and routines in order to keep close bones with customers. This activities can later enable companies to respond very quickly to potential or actual changes in the market (Verona and Ravasi, 2003; Griffith and Harvey, 2001). An example of the later can be found within the retail and consulting industries where the existence of IT-based information systems creates both efficiencies and flexibilities that lead to competitive advantage (Chuang, 2004; Lin and Silvia, 2005). Therefore, possessing relational processes deeply embedded in the history and tradition of the firm, may present unique and inimitable dynamic capabilities which lead to sustainable competitive advantages (Easterby-Smith and Prieto, 2008).

In the present study, we consider that the former view is more useful for the present study since it provides the distinctions between core constructs for each functional area. Therefore, we pretend to present the role of organizational learning capability in facilitating core operational routines of marketing, design and technology area. We expect the different functional dynamic capabilities to have a positive mediating effect
between organizational learning capability and organizational performance and to be an explaining factor on intra-industry performance differences.

The intermediate steps between firm’s openness behavior and organizational performance

Acquiring external knowledge and learning from partners represent two critical elements of inter-organizational networks (Lane et al., 2006; Volberda et al., 2010; Sun and Anderson, 2010). Inter-organizational cooperation allows firm to identify, transfer and internalize external knowledge. Previously, it was considered that firms could only obtain technological knowledge from external cooperation (Mowery et al., 1996; Szulanski, 1996; Lane and Lubatkin, 1998; Dyer and Singh, 1998; Dushnitsky and Lenox, 2005; Nooteboom et al., 2007). However, recently have been demonstrated that external acquired knowledge may consists of technical and management practices, models of human resource management, organizational structures, process know-how and knowledge about new markets (Lichtenthaler, 2009; Camisón and Forés, 2010).

Openness to external sources allows firms to draw in ideas from external agents to deepen the pool of technological opportunities available to them. Firms that are too internally focused may miss opportunities, as many knowledge sources necessary to achieve innovation can only be found outside the firm (Chesbrough, 2003). According to Laursen y Salten (2006) firms which employ a widely and deeply search strategy are able to gain and exploit innovative opportunities from external knowledge. Also, the type of innovation partners is important in the above relationship since firms rely for different kinds of innovations on specific knowledge sources and links (Chen et al., 2011). For instance, the scope, depth and orientation of a firm’s external sourcing strategic have been related to innovative performance (Laursen and Salter, 2006; Chen et al., 2011). However, the use of external technology requires that firms develop absorptive capacity to identify, assimilate and apply externally developed knowledge (Cohen and Levitnhal, 1990; Chen et al., 2009; Lane et al., 2006; Lichtenthaler, 2009). Access to external technologies and know-how is possible only if the firm had previously generated a knowledge base that enables it to successfully understand outside knowledge, connect it with existing stock of knowledge and finally exploit it commercially.

Some research investigating the influence of an organization’s collaboration with different actors on its innovative performance or on certain aspects of its absorptive capacity has been conducted (Fabrizio, 2009; Cockburn and Henderson, 1998; Belderbos et al., 2004; Becker and Dietz, 2004; Vinding, 2006; Spithoven et al., 2011).
However, most of these researches only focuses on co-operation with a certain type of actors, and investigates the influence of co-operation on innovation and not on absorptive capacity, or is not empirically verified (Murovec and Prodan, 2009). Recently, Murovec and Prodan (2009) show empirically that collaboration with different types of external actor influences demand pull and science push absorptive capacity. However, they do not considerate how scope, depth and orientation of external technology sources may influence firm’s absorptive capacity and the learning processes that comprise it. In this study, we pretend to extend Laursen and Salter (2006) and Chen et al., (2011) analysis of external search strategies and firm innovative performance by considering AC, and the different learning process that define it, as mediator factors. We also pretend to study the above mediator effect not only on innovative performance, but also financial, export and marketing performance.

*Figure 1. Research framework*
Methodology

We will carry out a *quantitative study* to examine the hypothesized links established in the introduction. Quantitative studies have the advantage of allowing the implementation of statistical procedures to obtain significant results over a representative sample. As a consequence, the hypothesized links could be generalized to other organizations with similar characteristics.

We will use validated and well established measures. Some concepts like innovation performance, export performance and or financial performance can be assessed by combining perceptual and objective measures. R&D budget, new product count (LBIO indicator), ROA (Return On Assets) and export intensity are objective measures; Innovation performance measurement scale is a perceptual measures (Alegre and Chiva, 2008). Other concept like organizational learning capability (Alegre and chiva, 2008), absorptive capacity (Lichtenthaler, 2009), firm´s openness search strategy (Chen et al., 2011; Laursen and Salter, 2006), design dynamic capability (Dickson et al., 1995; Chiva and Alegre, 2008) marketing dynamic capability (Vorhies et al., 2009) and technology dynamic capability (Kuo, 2011) will be assessed by measurement scales. In order to avoid common method variance problems and to guarantee consistent data, the questionnaire will be addressed to two different managers in each firm: a technical manager (for example, the production manager or the head of R&D department ) and a marketing manager (for example, the marketing or exports manager).

Combining perceptual and objective measures adds reliability to the analyses. Furthermore, using some objective indicators such as R&D budget, new product count, ROA or export intensity allows carrying out longitudinal analyses. This is particularly important because we want to study some time-dependent processes and capabilities.

The primary analyses of the data set will be based on structural equation modeling. Structural equation models have been developed in a number of academic disciplines to substantiate theory (Hair et al., 1998). This approach involves developing measurement models to define latent variables and then establishing relationships or structural equations among the latent variables. EQS 6.1 software will be used to estimate the models for our research hypotheses. We will complement structural equation modeling with other multivariate analyses such as analyses of variance and regressions.
Target population

Because some issues such as innovation processes might differ substantially from one industry to another, we propose controlling the industry effect by carrying out our empirical study in three different industries: biotechnology (high technology level), ceramic tiles production (medium technology level), and apparel industry (low technology level). We set out to obtain representative samples in each of these industries. Analyzing three industries with different technology levels will add generalization power to our findings and will allow interesting comparisons among these four sectors. Our objective is to get a minimum of 450 firms belonging to these four industries. We suggest undertaking this empirical study in the context of Spain because it is a country representative of Southern European economies.

Research limitations/implications

A few limitations of this study are worth noting. First, as the data will be based in self-reports assessment of managers, it may be subject to social desirability bias (Podsakoff and Organ, 1986). However, assurance of anonymity can reduce such bias even when responses relate to sensitive topics. Second, the data will be cross-sectional. Although this method is appropriated for testing our hypotheses, a longitudinal analysis examining the interaction between organizational learning capabilities, firm’s openness, absorptive capacity and functional dynamic capability may provide additional insights concerning the performance obtained under different conditions.

Practical implications

Concepts such as organizational learning capability, open innovation, absorptive capacity, functional dynamic capabilities and organizational performance have already been analyzed in previous research, but they are still not fully articulated. Our scientific contributions derive from analyzing these concepts (1) simultaneously adopting a multidimensional perspective, and (2) in industries with different technology levels. We expect to clarify in a consistent and robust way what is the role of absorptive capacity and functional dynamic capabilities in the already tested positive effect of organizational learning capability and firm’s openness on organizational performance.

Besides the academic benefit of our expected contributions, our expected results could be applied in the short term. The main benefits derived from the increase of knowledge we expect to produce consist of practical implications for policy-makers and managers.
wishing to improve business competitiveness on the basis of innovation/technology driven productivity enhancement and high value-added product development.

Originality/value,

The project raises interesting issues for management research providing a theoretical framework that introduces the intermediate steps between organizational learning capability and organizational performance; and firm`s openness search strategy and organizational performance.

References


