TRACK 5: SMEs, international new ventures and international entrepreneurship

Interactive paper

Knowledge search strategies, absorptive capacity and export performance in Spanish exporting SMEs

ABSTRACT

Export performance has become an increasingly important issue for SMEs in recent years as a result of the widespread phenomenon of globalization, and the economic recession in some regions such as Southern Europe. The present study analyzes how knowledge search strategies and absorptive capacity affect the export performance of SMEs. Results on an analysis of a sample of 248 Spanish exporting SMEs reveal that depth of external knowledge search contributes to firms' AC and export performance. Moreover, a mediating role is found for AC between depth of external knowledge search and export performance.

Key Words: Knowledge search strategies, absorptive capacity, exploratory, transformative and exploitative learning.

1. INTRODUCTION

In an increasingly globalized environment, both innovating and exporting play a vital role in the strategies of Small and Medium Enterprises (SMEs) (Golovko and Valentini, 2011; Uhlaner et al., 2013). Absorptive capacity (AC) is one important constructs that is providing new understanding on the way firms innovate. This concept was introduced by Cohen and Levinthal (1989), and since then it has been analyzed in different fields and contexts. The literature has identified several elements as antecedents of firms' AC, although inter-organizational antecedents have received most analytical attention (Lane et al., 2006).

Previous studies assessing the link between AC and inter-organizational antecedents have focused primarily on the characteristics of previous or related knowledge (Lane and Lubatkin, 1998; Lane et al., 2006). However, the nature and the kind of knowledge required by one of the collaborating firms may also affect the knowledge transfer, particularly through the type of mechanism required for its transfer (Khamseh and Jolly, 2008). Therefore, the knowledge search mechanisms could influence the knowledge transfer and the development of AC (Khamseh and Jolly, 2008; Murovec and Prodan, 2009). On the other hand, while a number of previous studies have examined the impact of AC on innovation outcomes and organizational performance further research is required to understand its impact on the process of internationalization.

The main objectives of this paper are therefore: (1) to investigate the role of the openness of external knowledge search strategies in improving firms' ability to assimilate, transform and apply external knowledge; and (2) to assess the effects of AC on export performance. To empirically analyze our hypotheses we draw on results from a survey of 248 exporting small and medium enterprises (SMEs) in Spain.

The structure of this paper is as follows. In section 2, we provide a literature review and propose three research hypotheses. In section 3, the methodology used in the empirical study and the characteristics of the sample data are described. Section 4 reports the results, and finally the conclusions and implications are discussed in section 5.

2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. The concept of absorptive capacity

Although Kedia and Bhagat (1988) first coined the term 'absorptive capacity', Cohen and Levinthal's (1990) contribution is generally regarded as the founding paper on the subject. These authors defined absorptive capacity (AC) as a firm's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends (Cohen and Levinthal 1990, p. 128). Lane et al. defined AC as a firm's ability to utilize externally held knowledge through three sequential processes: (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) combining existing knowledge with externally-acquired knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning (Lane et al., 2006: 856).

In recent years scholars have used the concept of absorptive capacity at different levels of their analyses: individual (Cohen and Levinthal, 1990; Minbaeva et al., 2003) business unit (Jansen et al., 2005; Szulanski, 1996) or organizational (Cohen and Levinthal, 1990). However, very few empirical studies have captured the rich theoretical arguments and the multidimensionality of the absorptive capacity construct (Murovec and Prodan, 2009). Some of the studies that modify Cohen and Levinthal's original definition alter the dimensionalization only slightly by limiting the construct to two dimensions: the first associated with the recognition, acquisition and assimilation of external knowledge, and the second, with its internal dissemination, reactivation and application.

One of the most important conceptualizations of AC since Cohen and Levinthal (1990) is that of Zahra and George (2002)**.** This new conceptualization emphasizes the systems, processes, routines and structure of the organization that allow firms to identify, assimilate, transform and exploit external knowledge. These authors argue that absorptive capacity has two general states: potential AC, which refers to the ability to value and acquire external knowledge, and realized AC, which reflects the capacity to leverage the knowledge that has been absorbed. Both subsets of AC have separate but complementary roles and fulfill a necessary but insufficient condition to improve firm

performance. By defining absorptive capacity as a dynamic capability, Zahra and George emphasized the strategic nature of absorptive capacity.

Even though the reconceptualization introduced by Zahra and George (2002) raises important issues about the components, antecedents, contingencies and outcomes of the construct, they do not sufficiently build on key insights from Cohen and Levinthal's (1989, 1990) original conceptualization. Furthermore, they only partly integrate in their model the substantial body of research on learning and innovation accumulated since those seminal articles (Sun and Anderson, 2010; Todorova and Durisin, 2007).

Lane et al.'s (2006) reconceptualization is one of the first works to attempt to integrate the insights generated in previous studies into Cohen and Levinthal's (1990) original definition, and to link AC and organizational learning theoretically. As AC represents a dynamic capability, the benefits of this capability depend on the underlying learning processes representing the mechanisms that allow an organization to purposefully create, extend or modify its resource base (Eisenhardt and Martin, 2000; Helfat et al., 2007). Therefore, following this process-based view Lane et al. defined AC as a firm's ability to utilize externally held knowledge through three sequential processes: (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) combining existing knowledge with externally-acquired knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning (Lane et al., 2006: 856).

We adopt this conceptualization for our analysis because the process-based definition of AC introduced by Lane et al. (2006) helps to capture the multidimensional and dynamic nature of the concept.

2.2. The role of depth and breadth in AC

A prior related technological and market knowledge base is necessary to recognize external knowledge (Lane et al., 2006; Zahra and George, 2002). This previous knowledge base provides firms with the relevant problem-solving methods that are critical for subsequent knowledge application (Lane and Lubatkin, 1998). Firms therefore need to establish the mechanisms that facilitate the continued acquisition and

assimilation of knowledge in their own context to keep their knowledge base up to date (Lane et al., 2006).

Depending on its knowledge needs, a firm may establish scanning mechanisms to help identify the knowledge present in the environment (Caloghirou et al., 2004; Cohen and Levinthal, 1990). These mechanisms or strategies may consist of developing a wide or deep number of relationships with external agents (Laursen and Salter, 2006). Previous studies have shown that developing relationships with different external actors is positively related to learning (Ahuja and Lampert, 2001; Rowley, Behrens and Krackhardt, 2000). Interaction with partners located in different lines of business often generates new ideas, since these companies facilitate access to a different knowledge base (Daghfous, 2004; Dittrich and Duysters, 2007; Granovetter, 1973). Therefore, a firm seeking to increase its knowledge base for product development will often collaborate with partners from different sectors (Dittrich and Duysters, 2007).

Considering the above, the following hypothesis is postulated:

Hypothesis 1a: the breadth of a firm's external knowledge search has a positive effect on its AC.

Another mechanism firms use to identify new knowledge sources is to develop deep relationships with a limited number of external agents (Laursen and Salter, 2006). Strong relationships between two parties are necessary for transferring and assimilating complex knowledge. Messeni-Petruzzelli et al. (2010) suggest the importance of strong inter-organizational ties as mechanisms that enable the transfer of knowledge in universities' network structures. When the knowledge firms need to innovate is tacit, they may require close interaction with external actors to facilitate the transfer and combination of the knowledge with the already existing knowledge base (Chen et al, 2011).

Hypothesis 1b: The depth of external knowledge search has a positive impact on the AC of a firm.

2.3. AC and export performance

Next, we would like to look at the relationship between AC and export performance. By doing so, we aim at providing a new and more comprehensive picture

on the link between how a firm manages external knowledge and exports. We argue that this new perspective might be helpful to better understand the antecedents of manufacturing SMEs competitiveness.

The technology capabilities of a firm have been considered as relevant resources to achieve competitive advantage (Yeoh and Roth, 1999). In this vein, López-Rodríguez and García-Rodríguez (2005) analyzed the impact of a firm's technological capacity over its export intensity in the context of Spanish manufacturing firms. They found that both innovation inputs (R&D spending) and outputs (product innovations and patents) positively and significantly affected export intensity.

Previous research has shown that AC has a strong and positive connection with innovation. The technology and innovation management literature generally predicts that innovative firms will have a tendency to enter foreign markets in order to increase sales volume and spread the fixed costs of innovation over a larger number of units (Tidd and Bessant, 2005; Rogers, 2004). Previous research is rather consistent in supporting that innovation performance encourages exports (Wakelin, 1998; Sterlacchini, 1999; Nassimbeni, 2001; Basile, 2001; Roper and Love, 2002).

Thus, we hypothesize:

Hypothesis 2: AC has a positive effect on export performance.

3. METHODOLOGY

3.1 Data collection

Fieldwork was carried out from January 2012 to April 2012. We performed a pre-test with four experts to ensure that the questionnaire items were fully understandable. The interviews with these experts reflected the insights from the literature and the informants were highly knowledgeable about the questions asked for this study. The framework and questions derived from the literature review were therefore used to conduct surveys in this industry. To avoid concerns on common method bias the answers for the independent and dependent variables were collected from two different respondents. Based on previous studies, the head of the R&D or a similar department was identified as the first informant for the organizational learning

processes (absorptive capacity). The second informant was the CEO, who was assumed to have expert knowledge about knowledge search strategies (breadth and depth measure).

Data were obtained from SMEs within four important Spanish manufacturing industries: biotechnology, ceramic tiles, toys and shoemaking industries. In order to obtain a representative sample we contacted by mail all the firms included in their respective industrial associations' databases, requesting their participation in the study. Appointments were made with respondents so that the questionnaire could be answered during a personal interview. We offered a feedback report on the survey results to the participating firms in order to encourage a higher response rate.

A total of 248 exporting SMEs agreed to participate in the study and personal interviews were arranged with each one of them. We tested for non-response bias by comparing the industries represented in the sample with the population sample in terms of size and revenues from sales and found no significant differences between the two groups. Table 1 provides a description of the sample.

Take in Table 1

3.2. Measurements

External knowledge search strategies

Drawing from previous studies we measured external knowledge search strategies using two dimensions: *depth* and *breadth of external knowledge search* (Chen et al., 2011; Laursen and Salter, 2006). *Breadth* refers to the diversity of the firm's relationships with external partners. We included eight types of potential external partners: other enterprises within their enterprise group; suppliers of equipment, material, components or software; clients of customers; competitors and other firms from the same industry; consultants; commercial laboratories or R&D enterprises; universities or other higher education institutes; and government or private non-profit research institutes. This dimension was operationalized as the number of types of external partners with whom

the innovating firm had a relationship. Firms scored 0 when no partners were used and 8 when they collaborated with all potential collaboration partners.

Depth of external knowledge search represents the intensity of relationships with external partners. In a previous study Chen et al. (2011) measured depth from the score of the importance for a firm's innovation activity of cooperating with eight types of external agents. The answers were based on an eight-point Likert scale, where 1 represented low importance and 8 high importance. The average of the 8 scores represented the depth of external knowledge search. The limitation of Chen et al.'s measure is that it does not allow us to distinguish cases in which a firm has a very deep relationship with specific external agents from those in which the firm has less deep relationships with more external partners. For instance, using the Chen et al. (2011) methodology, a firm that values with an 8 its relationship with only one external agent and 0 for all the others will score the same average as a firm that indicates a value of 1 for all eight types of potential external partners. These behaviors are different; however with this measure they would be treated as equal.

In order to refine the measure of depth, we considered that a value from zero to four does not represent a deep relationship between the firm and the external partner, whereas scores from five to eight represent deep relationships with the partner. We assigned a score of zero to the former and one to the latter. Therefore, firms had an average of 0 when there was no deep relationship and a value of 8 when they had a deep collaboration with all potential partners.

Absorptive capacity

To measure absorptive capacity we adopted the process based definition of the concept (see Lane et al., 2006) and used adapted version of the measurement instrument developed by previous studies (Arbussà and Coenders, 2007; Garud and Nayyar, 1994; Jansen et al., 2005; Marsh & Stock, 2006; Smith et al., 2005; Szulanski, 1996).

Control variables

In our study we included two control variables, which may provide possible alternative explanations for our results. Firms' size may affect the flexibility and willingness of the firms to invest in the development of AC; we therefore included the *natural logarithm* of the number of full-time employees in the organization to account for firm size

(Jansen et al., 2005; Veugelers, 1997). Furthermore, we also took into account the industry as a control variable.

4. ANALYSIS AND RESULTS

Results show a significant and positive effect of depth knowledge strategy on AC providing support to Hypothesis 1a. However, Hypothesis 1b is not supported by our analyses. Breadth knowledge strategy has an almost null effect on AC.

AC has a positive impact on export performance, which provides support for hypothesis 2. So, AC and depth strategy can be considered important antecedents of export performance. Moreover, the analysis shows that AC plays a mediating role between depth and export performance. This implies that those exporting SMEs with hihgh levels of AC will get a higher advantage on their efforts on depth strategy.

Size has a significant effect over the dependent variable, while the industry does not play an important role. The R2 of the whole model is rather low, which means that there a number of other antecedents of export performance that have not been included in the model.

Figure 1 shows the results.

Take in Figure 1

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5 DISCUSSIONS AND CONCLUSIONS

The purpose of this study was to examine the different effects of external knowledge search strategies and AC on the export performance of SMEs.

Although major advances have been made in the analysis of the antecedents of absorptive capacity (e.g., Jansen et al., 2005; Pedersen and Schleimer, 2012), the link between specific managerial mechanisms and the learning processes that generate a

firm's AC have not been fully analyzed. Results reveal the importance of external knowledge search strategies in enhancing a firm's AC.

Our findings suggest that the depth of external knowledge search enhances a firm's AC. However, no significant relationship has been found for breadth external knowledge strategy. Further analyses need to be taken into account to fully interpret the meaning of this result.

AC has an important effect on export performance. This finding is in line with a whole stream of the literature connecting innovation and technology management with exports (Pla-Barber and Alegre, 2007) and provides a new insight on the importance of the management and assimilation of external knowledge.

From a practical perspective, our study suggests that managers should be aware of the importance of developing deep relationships with external actors in order to improve their firms' AC and exports.

This study has some inherent limitations that also suggest future research lines. First, the data were gathered at one point in time, which prevented us from studying causal relationships among the variables analyzed. A longitudinal study may provide further insight into the dynamic of the learning processes and how they allow a firm to generate competitive advantage from knowledge from external sources. In addition, our data came from self-reported assessments by firms' managers. Although some considerations were taken to limit concerns regarding self-reported data, the issue of key informant bias and common method variance cannot be totally ruled out.

Nevertheless, the results of the present study provide some guidelines for future studies. Future research may assess in more detail why breadth appears to be not significant. Additional antecedents of export performance could also be included in subsequent models.

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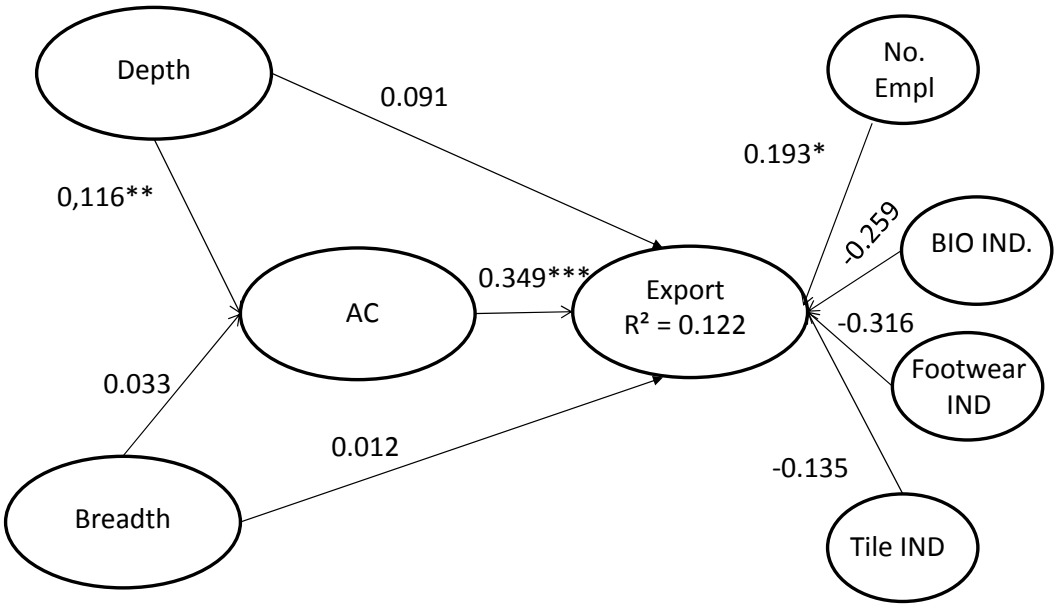
Table 1: Description of the sample

		Size		
Industry	Sample	Mean	Min	Max
Biotechnology	53	25,13	3	198
Tile	68	57,93	1	196
Footwear	83	30,21	3	193
Toys	44	31,33	1	200
TOTAL	248			

Figure 1. Results



APPENDICES:

Questionnaire items for absorptive capacity

Could you please indicate your level of agreement with the following statements about your organization?		
Dimension	Item	Literature source
Recognize	X1: We frequently scan the environment for new technologies.	Arbussà and Coenders, (2007); Jansen et al., (2005); Szulanski, (1996)
	X2: We thoroughly observe technological trends.	
	X3: We observe in detail external sources of new technologies.	
Assimilate	X4: We periodically organize special meetings with external partners to acquire new technologies.	
	X5: Employees regularly approach external institutions to acquire technological knowledge.	
	X6: We often transfer technological knowledge to our firm in response to technology acquisition opportunities.	
Maintain	X7: We thoroughly maintain relevant knowledge over time.	Jansen et al., (2005); Marsh and Stock, (2006); Smith et al., (2005)
	X8: Employees store technological knowledge for future reference.	
	X9: We communicate relevant knowledge across the units of our firm.	
Reactivate	X10: When recognizing a business opportunity, we can quickly rely on our existing technological knowledge.	Garud and Nayyar, (1994); Jansen et al., (2005); Marsh and Stock, (2006)
	X11: We quickly analyze and interpret changing market demands for our technologies.	
	X12: New opportunities to serve our customers with existing technologies are quickly understood.	
Transmute	X13: We are proficient in transforming technological knowledge into new products.	Jansen et al., (2005); Smith et al., (2005); Todorova and Durisin, (2007)
	X14: We regularly match new technologies with ideas for new products.	
	X15: We quickly recognize the usefulness of new technological knowledge for existing knowledge.	
Apply	X16: We regularly apply technologies in new products.	Jansen et al., (2005); Smith et al., (2005); Szulanski, (1996)
	X17: We constantly consider how to better exploit technologies.	
	X18: It is well known who can best exploit new technologies inside our firm.	

Questionnaire items for external knowledge sources for innovation

Could you please indicate which of the following sources of information has your organization used to innovative? If so, please assess the level of importance of those sources.	
Item	Literature source
X19: Other organizations within the business group	Chen et al. (2011); Murovec and Prodan (2009)
X20: Competitors and other enterprises from the same industry	
X21: Suppliers of equipment, materials, components or software	
X22: Clients or customers	
X23: Consultants	
X24: Laboratories or R & D companies	
X25: Universities or other higher education institutes	
X26: Government or private non-profit research institutes	