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Internal resources, local externalities and export performance: An application in the Iberian ham cluster

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Abstract

This research aims to complement resource-based view with a cluster approach in identifying which elements, both internal to the firm and locally available, improve firms' export performance. While in the resource-based view exporting firms are contingent upon the development of intangible resources, from a cluster approach exporters exploit local externalities, mainly related to local information, knowledge and resource spillovers. We present empirical evidence from the Iberian ham cluster in Spain, which confirms the relevance of intangibles such as R&D and marketing promotion, but also of cluster linkages with local institutions – technological centres, universities and use of Designation of Origins – in improving export performance. Contrary to expectations, employee education, organizational experience, and information and knowledge-based spillovers from proximate exporters have no significant effect. These findings suggest that an augmented framework may improve the predictive elements of export performance in clusters.

Keywords: cluster, exports, firm resources, local institutions

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INTRODUCTION

The involvement of firms in export processes to transfer their goods and services across national boundaries has been broadly considered as an indicator of their overall competitiveness. Firms that are able to penetrate foreign markets are exposed to more intensive competition, while they also incur in the sunk costs associated with doing this (Malmberg, Malmberg, & Lundequist, 2000; Greenaway & Kneller, 2008). As a consequence, firms that dedicate part of their effort to selling abroad need to intensify the search for their source of competitive advantage in both national and international markets.

Extensive literature, mainly from the resource-based view, has highlighted the relevance of internal and valuable resources to success in international markets (Andersen & Kheam, 1998; Majocchi, Bacchiocchi, & Mayrhofer, 2005; Tseng, Tansuhaj, Hallagan, & McCullough, 2007). Under this approach it is considered that firms are heterogeneous in their valuable resources, and that such heterogeneity is sustainable over time insofar as these resources are not perfectly mobile across firms (Barney, 1991). Different resources, such as R&D investments (López Rodriguez & García Rodriguez, 2005; Wilkinson & Brouthers, 2006), reputation and marketing promotion (Erramilli, Agarwal, & Kim, 1997; Kotabe, Srinivasan, & Aulakh, 2002), or human resources (Cavusgil & Naor, 1987;

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Gomez-Mejia, 1988), have been analyzed in order to explain firms' competitive advantage and their international presence.

From a regional point of view, firms' ability to compete in international markets has been also extensively considered (Aitken, Hanson, & Harrison, 1997; deMartino, McHardy Reid, & Zygliodopoulos, 2006). It is argued that the geographical agglomeration of firms and institutions into clusters may help exporters by offering advantages only available in a bounded geographical area (Porter, 1998). These advantages can derive from externalities created by having an increasing number of proximate firms. It was Marshall (1920) who pointed out the relevance of local externalities and explained them by the access to specialized labour and providers, knowledge spillovers and heightened local demand for reducing consumer search costs. Moreover, clustered firms share a complex social and cultural identity, based on collective beliefs, conventions and history, that facilitates coordination, communication and learning among neighbouring firms (Becattini, 1990; Maskell, 2001).

This research uses both approaches when trying to identify those factors that may improve the export performance of firms. We try to understand how internal pool of resources and the access to locally bounded externalities may affect the export performance of firms. In particular, export performance is measured as both: firms' probability of becoming exporters and their export intensity.

As part of this, the research tries to contribute by deepening in the understanding of the role that valuable resources would play on their export performance. The resource-based view of the firm has become influential in explaining internationalization, but, as several authors have pointed out (Pla-Barber & Alegre, 2007; Tseng et al., 2007; Wilkinson & Brouthers, 2006), there is a shortage of evidence about which resources are the most useful when it comes to foreign activity, especially in cluster environments. Since clustered firms are embedded into a rich local community that increases the mobility of firms' resources (Dei Ottati, 1991; Storper, 1995), it would be interesting to identify which resources are most relevant for international activities under these external conditions.

Second, this study aims to complement the resource-based view with the cluster approach. A growing body of management research is considering clusters to explain firms' national and international competitiveness, while empirical evidence is still non-conclusive (Kukalis, 2010; Molina-Morales & Martinez-Fernandez, 2010). In this sense, studies have tended to assume that all clustered firms benefit in the same way, so just for belonging to a cluster firms can improve their export performance (Lovely, Rosenthal, & Sharma, 2005; Becchetti, Panizza, & Oropallo, 2007; Pla-Barber & Puig, 2009).

In this research we consider that local externalities not only depend on belonging to a cluster, but also on internal differences among firms (McEvily & Zaheer, 1999; Molina-Morales & Martinez-Fernandez, 2004). Cluster externalities are created by the collective effort of neighbouring firms and institutions. In consequence, firms with superior internal resources would contribute most to these externalities, while those with poorer resource bases would not (Shaver & Flyer, 2000; Chevassus-Lozza & Galliano, 2003; Greenaway & Kneller, 2008).

Finally, this paper contributes in taking into account the function developed by local institutions, such as universities, technological institutes or professional associations. Firms that develop linkages with local institutions have access to information and knowledge flows, can improve their products or processes, and can obtain a higher reputation and reliability in international markets (Morgan, 1997; Molina-Morales & Martinez-Fernandez, 2004). Nevertheless, few studies have considered local institutions in explaining export behaviour (e.g., Welch, Welch, Young, & Wilkinson, 1997; Keeble, Lawson, Lawton, & Wilkinson, 1998; Nassimbeni, 2001; Requier-Desjardins, Boucher, & Cerdan, 2003).

Empirical evidence was obtained in the Spanish Iberian ham cluster, located in the south-west of Spain. This paper exploits a Government database that allows us to identify Iberian ham producers and analyze their characteristics. Agri-food industries represent one of the leading manufacturing

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sectors in Europe, and thus are attracting interest from academics, managers and public bodies trying to identify their role in increasing firms' competitiveness (Requier-Desjardins, Boucher, & Cerdan, 2003; Bernard & Jensen, 2004).

This paper is structured into the following parts: the theoretical background including several proposed hypotheses is presented in the second part. The third part offers a description of the Spanish Iberian ham sample and includes an explanation of the way the variables were measured. The fourth part summarizes the main results and discussions, before conclusions and possible areas for future research are presented.

THE RESOURCE-BASED VIEW AND INTANGIBLE RESOURCES

Antecedents

The main contribution of the resource-based view to explain how internal characteristics affect exports is in identifying the conditions under which resources give firms a sustainable competitive advantage. According to Peteraf (1993), there are four such conditions: resource heterogeneity, *ex-ante* limits to competition, *ex-post* limits to competition and imperfect mobility. Along with these conditions, Teece, Pisano, and Shuen (1997) note that firms trying to maintain a competitive advantage have to constantly develop and improve their internal resources because over the long term these would be imitated or transferred to competing firms. Firms have to renew resources to respond to changes in business environments caused by factors such as technological innovation, new competitive conditions or market difficulties.

The identification of a sustainable competitive advantage is of great relevance, but exporters not only need resources that provide a source of sustainable competitive advantage, they also need resources that are underused in the national market (Wilkinson & Brouthers, 2006). It is the excess of valuable resources in the domestic market that can be leveraged across international markets, which incentivizes firms to sell abroad and accept a greater degree of competition (Tseng et al., 2007).

Firm internal resources have generally been classified into three categories: physical, financial and intangible resources (Chatterjee & Wernerfelt, 1991). Physical and financial resources, such as plant, equipment or loans can be used only to the point where they are physically exhausted, while they are not normally heterogeneous (Andersen & Kheam, 1998). Intangible resources are generally knowledge specific to the firm and they can leverage abroad (Andersen & Kheam, 1998; López Rodriguez & García Rodriguez, 2005). As a consequence, while these resources have been considered as important in increasing firms' export performance (e.g., Lee & Habte-Giorgis, 2004), most studies have focused on intangible resources, such as R&D investment, reputation or firm experience (Andersen & Kheam, 1998; López Rodriguez & García Rodriguez, 2005).

Hypotheses

Following Grant (1991), intangible resources have been generally classified into four subcategories: technological, reputational, human and organizational resources; each one inducing firms to enter and expand their international presence.

Technological resources can be a source of long-term competitive advantage as firms that invest in R&D can innovate either in product design and characteristics or in improving the manufacturing process for these products (Kotabe, Srinivasan, & Aulakh, 2002). In particular, firms investing in R&D can increase productivity by reducing production costs or differentiating their products. In doing so, the firm can tailor products to meet customer requirements or develop higher quality products (Molina-Morales & Martinez-Fernandez, 2004; Wang, Hsu, & Fang, 2008).

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Most studies argue that technological resources increase export performance by means of differentiation, as firms need to offer high quality and relatively unique products in international markets (Nassimbeni, 2001; López Rodríguez & García Rodríguez, 2005) or they can modify them to take into account the variety in demand in international markets (Alvarez, 2004). In addition, firms that make R&D investments have incentives to expand into other markets to recover such investments, either because the domestic market is too small or because it would have too long a pay-back period (Lee & Habte-Giorgis, 2004). Based on that, we propose:

Hypothesis 1: R&D investments improve firm export performance.

Firms can also increase their export performance developing a reputation and brand image (Dowling, Liesch, Flint, As-Saber, Chan, & Innes, 2000). Reputation can be understood as the collective representation of a firm, how different stakeholders perceive its past actions and future prospects; while image is the perception of the firm that only external observers have (Barnett, Jermier, & Lafferty, 2006). Firms that create a strong reputation and image can set higher prices as compared to those offering competing products with identical physical features (Chen & Hsu, 2010). Moreover, they have better bargaining power with both distributors and consumers that allows for favourable negotiation prices and exchange conditions (López Rodríguez & García Rodríguez, 2005).

Firm reputation and image are the result of several factors such as the past performance of the firm, its social responsibility, investors, degree of diversification, etc., but market promotion is essential as it signals the product's and firm's characteristics. By marketing promotion, firms not only make more information available in foreign markets, but also favourably shape information through different media (Fombrum & Shanley, 1990; Chung & Kalnins, 2001). This is of special relevance in the Iberian ham production, as its quality can only be ascertained through experience – that is 'experience good'. A firm that invests in marketing promotion to advertise its products can increase sales in international markets through becoming more discernable and differentiating themselves from other competing products (Kotabe, Srinivasan, & Aulakh, 2002). Taking into account the above argument, we hypothesize:

Hypothesis 2: Marketing promotion investments improve firm export performance.

Human resources play an essential role in international activities because these are much more complex, uncertain and demanding than local activities (Peng, 2001; Skaggs & Youndt, 2004; Contractor & Mudambi, 2008). Exporting requires the labour force to be competitive in nearly all activities inside the firm. It has to be capable of developing new styles to satisfy overseas customers and making samples and arranging schedules for export orders. In addition, the accounting department must be able to handle complex credit arrangements for foreign customers and documents for overseas payments and the admin team must handle overseas orders, correspondence in a foreign language, etc. (Tookey, 1964; Gomez-Mejia, 1988).

As a consequence, firms should hire employees with skills, experience and intelligence who can respond to this challenge, and this can be achieved by having a highly educated labour force (Hambrick & Mason, 1984). Highly educated personnel have better problem-solving skills and are more able to effectively respond to a changing environment. Furthermore, educated employees are more open-minded and interested in foreign affairs (Garnier, 1982). Empirical evidence indicates a positive relationship between educational level and internationalization (Simpson & Kujawa, 1974; Cavusgil & Naor, 1987; Dichtl, Koeglmayr, & Mueller, 1990). Hence:

Hypothesis 3: Employee education improves firm export performance.

Finally, organizational experience is an important intangible resource in explaining a firm's export performance. Before entering international markets, firms need to know more about the characteristics of the industry where they are located and have developed competitive positions in

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that area. While many young high technological firms are born global, so they quickly internationalize, this may not be the case for more traditional industries that tend to follow a time sequence in their international process (Majocchi, Bacchiocchi, & Mayrhofer, 2005).

Internationalization requires a time-consuming process of obtaining the financial resources needed to expand overseas, building a position in domestic markets, controlling production and selling techniques, and becoming familiar with industry habits and rules. As the firm develops a high degree of knowledge about the market and establishes a more solid and stable domestic market, the perceived risk to the firm of selling abroad decreases (Schwens & Kabst, 2009). As a consequence:

Hypothesis 4: Organizational experience improves firm export performance.

CLUSTERS AND LOCAL EXTERNALITIES

Antecedents

Since North (1955) argued that location advantages reduce production costs for exportable products, thus favouring regional development, many studies have positively related clusters to greater regional exports (Aitken, Hanson, & Harrison, 1997; Belso-Martinez, 2006; Bertolini & Giovannetti, 2006; deMartino, McHardy Reid, & Zygliodopoulos, 2006). In general terms, the view is that clusters may help to increase the competitive advantage held by small- and medium-sized enterprises (SMEs), thereby allowing them to compete more effectively than their dispersed counterparts in international markets (Keeble et al., 1998; Greenaway & Kneller, 2008).

These advantages can derive from externalities created by having an increasing number of proximate firms or agglomeration externalities. According to Marshall (1920) and Krugman (1991), agglomerated firms have access to specialized labour and inputs because the presence of many alternative firms incentivizes employees and input suppliers to develop industry-specific skills that firms could not afford individually. In addition, co-located firms can benefit from information and knowledge spillovers. Physical proximity allows for face-to-face contact as a result of formal and informal interactions among employees and managers from different firms. Employees and managers can establish relationships, providing each other with personal contact and technical advice as well as gossip and rumour, observation and the chance to imitate each others' activities (Tallman, Jenkins, Henry, & Pinch, 2004; Arikan, 2009).

However, clusters are not only geographically proximate groups of firms. Clusters are geographic concentrations of companies and institutions in a particular field that have productive, commercial and social interdependencies among them (Porter, 1998; Rocha & Sternberg, 2005). That is, they are characterized by the presence of a community of people that share a complex social and cultural identity (Becattini, 1990) based on collective beliefs, values, conventions, history and language. In this social milieu, firms undertaking related activities develop shared recognition patterns and collective behaviour, such as informal rules and habits, or 'untraded interdependencies' (Storper, 1995). As a consequence, clustered firms find it easier to communicate, interpret and learn from others while also develop a higher relational trust (Dei Ottati, 1991).

On the basis of these agglomeration economies available to neighbouring firms, it has been inferred that clustered SMEs should have a better export performance than non-clustered SMEs (Lovely, Rosenthal, & Sharma, 2005; Becchetti, Panizza, & Oropallo, 2007). Nevertheless, under this reasoning it is implicitly assumed that firms inside a cluster are homogenous so all of them have access to the same regional advantage. Actually, each clustered firm establishes its particular location and relationships with other, switching from a firm to another the externalities they can enjoy (McEvily & Zaheer, 1999; Molina-Morales & Fernandez-Martinez, 2004). As a consequence, understanding these differences among clustered firms is relevant as they affect their competitiveness and success

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(DeCarolis & Deeds, 1999; Canina Enz & Harrison, 2005; Folta, Cooper, & Baik, 2006). In particular, many empirical studies (Aitken, Hanson, & Harrison, 1997; Clerides, Lach, & Tybout., 2008; Greenaway & Kneller, 2008) associate these cluster asymmetries with either the presence of local exporters that confer local knowledge spillovers or relationships with local institutions that act as gatekeepers and improve local reputation.

Hypotheses

Clusters give access to economies that are external to the firm but internal to a geographical area, being first, created by the collective contributions of local firms: they give access to resources, information and knowledge spillovers to other exporting firms located in proximity (Aitken, Hanson, & Harrison, 1997; Greenaway & Kneller, 2008). Exporters have access to valuable information and knowledge about foreign markets in terms of the different national market rules, other tastes and client preferences, distribution chains and external management practices (Aitken, Hanson, & Harrison, 1997; Majocchi, Bacchiocchi, & Mayrhofer, 2005).

Most of this relevant knowledge is tacit and difficult to be transmitted among firms (Arikan, 2009). Firms' knowledge about their previous experience in international markets is not easily transferred to other firms, as each firm has its own path-dependent learning process conditioned by their social context and culture, past activities and technologies and markets that firms have been undertaking (Teece, Pisano, & Shuen, 1997).

Nevertheless, firms located in a cluster could also gain access to the knowledge held by other exporting firms located around them, that is, export externalities (Aitken, Hanson, & Harrison, 1997; Lovely, Rosenthal, & Sharma, 2005; Greenaway & Kneller, 2008). Along with developing direct experience, clustered firms can learn about distant markets indirectly, without having to go through exactly the same experiences as their neighbouring exporting firms (Eriksson, Johanson, Majkgard, & Sharma, 1997; Shaver, Mitchell, & Yeung, 1997). The physical, social and cognitive proximity of the cluster can be a driver of knowledge spillovers since firms tend to share knowledge with whom they are socially and physically proximate. The access to this knowledge is limited to proximate firms (Almeida & Kogut, 1999) as it is not easily accessible to outsiders without this shared social and cultural identity (Becattini, 1990; Lambooy, 2010).

It is precisely exporting firms' physical and cognitive proximity that favour the learning process among clustered exporting firms (Giuliani, 2005). Since knowledge transfer occurs in a shared social context in which different firms are linked to one another, clusters facilitate communication while also improve mutual understanding among firms (Dei Ottati, 1991). Inside a cluster firms develop complex routines as a consequence of their shared experiences and beliefs, that allow them to share and understand others' tacit knowledge easily (Grant, 1996; Expósito-Langa & Molina-Morales, 2010). That is, firms develop informal rules, habits or 'untraded interdependencies' (Storper, 1995) that foster shared patters and behaviours where knowledge can flow from a firm to others. Moreover, these interactions between cluster firms are facilitated by the emergence of interfirm trust and cooperation (Arikan, 2009).

While more distant firms would require a costly and time-consuming process to obtain information and knowledge from other exporters, firms located close to other exporter firms can obtain them from the neighbourhood. Geographical proximity in a cluster increases not only the frequency of the interactions between cluster firms but also the effectiveness of these knowledge exchanges. Based on that, it is hypothesized:

Hypothesis 5: Proximity to exporters improves firm export performance.

Along with the access to resources, information and knowledge from neighbouring exporters, firms can also increase their international presence by establishing linkages with local institutions.

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Local institutions are understood as different agents, such as technical assistance centres, universities, training centres, technological institutes and professional associations. From all of them, and taking into account the relevance for the industry, we focus on technology institutions and universities on one hand and Designations of Origins (DOs) on the other.

Linkages with technology institutions and universities increase firms' international presence first, by improving its access to new information, ideas, opportunities and experiences (McEvily & Zaheer, 1999). They can provide market research, industry-applied research and development, and diffusion of local practices (Amin & Thrift, 1994: 14; May, Mason, & Pinch, 2001). In this sense, these institutions can more easily establish contacts with agents from outside the cluster, national or international ones, so they can supply the cluster with new ideas and concepts that are not redundant for local firms such as the development of new production processes or how to increase the quality of the product (Keeble et al., 1998; deMartino, McHardy Reid, & Zygliodopoulos, 2006).

Besides, technology institutions and universities mediate among firms that have complementary interests and could share experiences. Rather than firms all being linked to each other, each can maintain a single connection with the local institution that specializes in providing access to information held by the others (McEvily & Zaheer, 1999). They act as repositories of knowledge because they interact with a large number of firms, all undertaking similar activities and facing similar problems, so they have compiled and developed extensive experience and knowledge that can help firms (Molina-Morales & Martinez-Fernandez, 2004: 478). Taking this into account:

Hypothesis 6: Linkages with technology institutions and universities increase firm performance.

Linkages with DOs also increase firms' international presence by creating a collective reputation and reliability in international markets (Benjamin & Podolny, 1999). Local institutions increase the influence of local cultural and historical factors by establishing habits, norms and routines that underpin the social structure of a region – 'institutional thickness' (Amin & Thirft, 1994). While pressures to conform to these common understandings may exist throughout the entire cluster, when firms establish direct relations with institutions they signal their adherence to certain institutional views (Baum & Oliver, 1992).

As a consequence, DOs can increase firms' visibility to outsiders and protects their collective reputation by supervising behaviour and restringing the entry of firms to the affiliation (Benjamin & Podolny, 1999). As long as linked firms follow these rules, values and conventions, it is easier to predict their behaviour, and firms become more reliable for overseas clients: they have the same quality standards, procedures and employee qualifications, among others. Taking this into account:

Hypothesis 7: Linkages with DOs increase firm performance.

METHODOLOGY

Spain produced 5.16 million tons of Iberian ham in 2009, with production growth over the last decade being due mainly to the observed increase in the volume and range of destinations for exports. Iberian ham is made by curing the hind legs of Iberian pigs and it is produced in the south-west of Spain, in the Iberian ham cluster. This ham is considered to be a product of extraordinary quality, healthy to eat and highly valued; a whole piece can cost up to €400. For the raw material to be classified as Iberian pork the mother must also be from the Iberian breed[1], and these animals are

[1] A genealogical table of Iberian pigs identifies all the possible Iberian parents (Royal Decree 1469/2007 of 2 November, on the regulation of the quality of Iberian meat, ham, cured pork shoulder and cured pork loin).

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reared free-range in fields of evergreen oaks, called '*Dehesas*'. The Iberian ham production process is a traditional process, which dates back to Roman times: salting the piece by dry rubbing, post-salting, where the piece is massaged to help the salt penetrate and improve appearance; drying, where the piece is hung to create its particular aroma and taste; and maturing in storerooms for up to one and a half years. The total time required to rear and cure Iberian ham is at least two and a half years.

The success of the curing process depends primarily on the temperature and humidity conditions when the pieces are processed. The temperature and humidity should change and be correct for each step, but should also reflect the size of the piece and the taste and quality to be obtained. Traditionally, producers had no control over these external conditions and so they synchronized production with the seasons being all geographically concentrated in those zones with better climate conditions. Nowadays, many producers use artificial stores to replicate ideal external conditions, maintaining the high quality of the final products although they are still in the same location.

Along with a geographical concentration of similar firms, the Iberian ham cluster counts with other firms that complement the production process: there are farms that provide the pig with the conditions needed to the production process, storage houses that control the production during the curing process or specialized shops that offer the product to clients. In addition, there are firms that exploit the benefits of the cluster and the affluence of clients such as restaurants, tourist tours to visit the production process or courses for learning about cutting the ham. Finally, the presence of local institutions, mainly technological centres and DOs, has helped to the development of both local knowledge spillovers and share cultural, norms and behaviours among firms.

Sample collection

Different databases were used to define our population of firms. First, the list of all existing ham producers was obtained from the Spanish Agency for Food Safety and Nutrition, an autonomous institution headed by the Spanish Ministry of Health and Consumer Affairs. All meat-industry establishments are required by Spanish and European law to register their activities with this census[2]. This database was used in conjunction with information provided by Independent Iberian Bodies in each Autonomous Community and this allowed us to discriminate Iberian ham producers from other meat producers[3]. We were able to obtain information from most Autonomous Communities (Castille-Leon, Extremadura and Andalusia), but marginal Iberian zones (Murcia, Madrid and Castille La Mancha) representing 5% of total Iberian production were missing. The total number of Iberian establishments in 2009 for the remaining 95% was 535, and this corresponds with the 430 companies. All these companies are necessarily producers, which excludes all firms that are only farmers, storehouses or distributors.

We used phone calls and website information to find out whrther the firms in the population were exporters or non-exporters in 2010. We also carried out a telephone survey, at times completed by mail, to gather information on the dependent variable and the independent variables. This was conducted from March to April 2011, and answers on all the variables were gathered for 250 companies (58% of the sample). While the dependent variable, export performance, refers to 2010, the independent variables are measured in 2009. A comparison of the firms that responded with the population of all firms using the χ^2 test showed no statistically significant differences between the sample and the population with regards to size.

[2] These independent bodies are headed by the Ministry of the Environment and Rural and Marine Affairs (Royal Decree 1712/1991 of 29 November, on the General Registry of food hygiene).

[3] Royal Decree 1469/2007 of 2 November, on the regulation of the quality of Iberian meat, ham, cured pork shoulder and cured pork loin.

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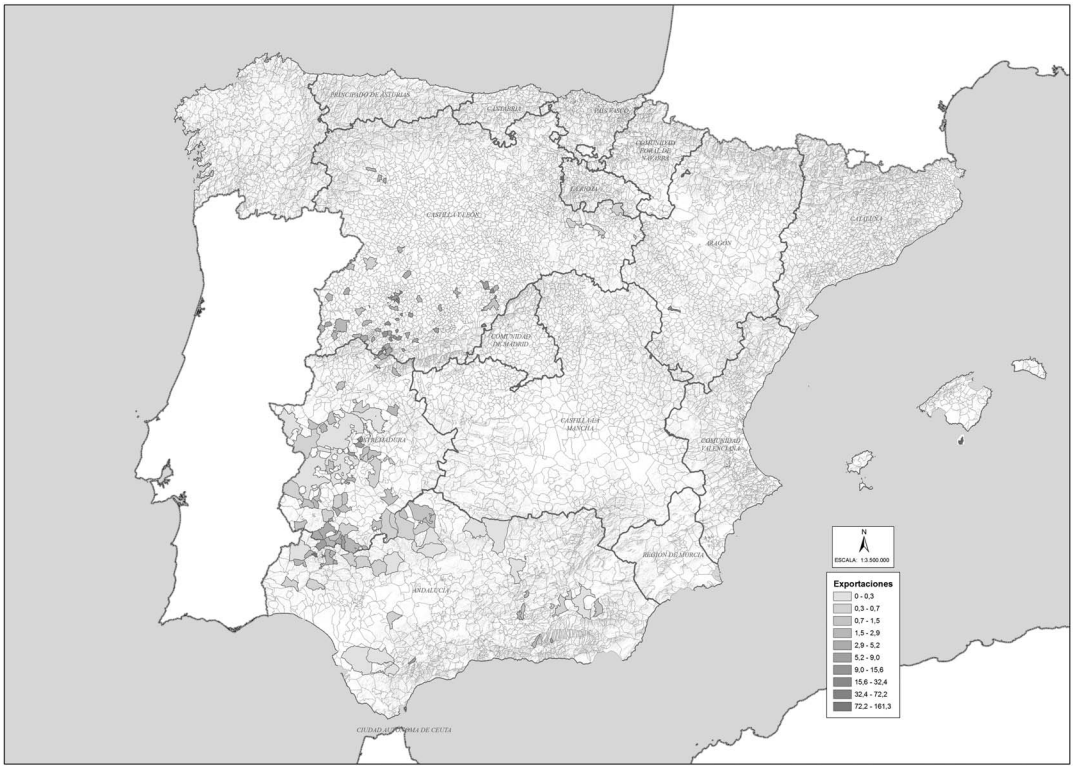

FIGURE 1. DENSITY OF EXPORTERS PER HECTARE

Export characteristics in the Iberian ham industry in Spain

Spanish Iberian ham firms that have become exporters tend to follow a non-diversified strategy, as 68.87% of the firms analyzed keep their exports in Europe. This is coherent with the ham industry in general, where public data point out that ~80% of the production is exported to the European Union. Their main destinies for this product are France, Germany, Portugal, Belgium, Italy and the United Kingdom, to those new markets like Japan or Mexico, have recently joined.

In these international markets firms can chose among many alternative distribution channels: 43.40% of all firms in our sample rely only on direct channels, predominantly selling agents and internet sales; while 44.34% rely on indirect channels, in which an intermediary firm is used to control the goods as they cross the international border. Retail distributors, wholesale distributors and export associations are the primary indirect channels an Iberian ham producer may use when selling its products in the foreign market. Finally, only 12.26% of the sample is using both types of channel, export directly to customers abroad and export indirectly with the help of an intermediary. Figure 1 presents the distribution of exporters along the different municipalities.

Measurement of variables

Export performance

In this research we distinguished between two aspects of a firm's export behaviour: first, the decision on whether or not to export; and second, its export intensity (percentage of sales abroad) once the

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decision has been made. These are the variables most commonly used to measure a firm's export performance (Singh, 2009), both in the resource-based view (Grant, Jammine, & Thomas, 1988; Pla-Barber & Alegre, 2007) and when the influence of clusters on exports is considered (Aitken, Hanson, & Harrison, 1997; Chevassus-Lozza & Galliano, 2003; Bernard & Jensen, 2004; Koening, 2009). In the sample of Iberian ham producers in Spain, 106 of 250 (42.4%) are exporters and 144 (47.6%) are non-exporters.

This industry is characterized by increasing export intensity. The increasing demand of Mexico, Japan and other distant markets, as well as the need of higher sales to improve their efficiency, has motivated firms to go outside. Nevertheless, not all firms are able to become exporters as they have to incur in high sunk costs and there is a higher competition. Because of that, Spanish government has tried to control the firms that are entering in new markets by imposing strict controls to all of them in order to guarantee that only the best can sell outside.

Internal resources

The majority of firm-level studies on innovation and export performance have utilized R&D investments as a measure of innovation. R&D investments are generally measured as a proportion of R&D expenditures of total sales (Gruber, Mehta, & Vernon, 1967; Wang, Hsu, & Fang, 2008; Singh, 2009) and it is this measure that we used in this research. Iberian ham firms are investing on their products mainly by improving their appearance. International clients tend to prefer the product in slices or small pieces, so they try to develop new storage facilities that also increase its durability. Complementarily, new research is being undertaken to reduce the uncertainty related to the final quality of the product, in order to standardize taste and quality.

It is generally accepted that a high level of marketing promotion investments reflects a firm's high degree of commitment to marketing-based strategies that allow the firm to differentiate its products from those of its competitors (Singh, 2009; Chen & Hsu, 2010). Therefore, it stands to reason that we use the ratio of marketing promotion to total sales as a proxy for marketing promotion investments (Chiao, Yang, & Yu, 2006). The main forms of advertisement used in the Iberian ham industry are participation in international fairs, marketing promotion in specialized media and tasting outlets. Most products offered in the Iberian ham industry in Spain are addressed for household consumption, consumed either within at home or away from home (e.g., in a restaurant).

Previous literature in the international business field argues that a high education level is associated with internationalization (Cavusgil & Naor, 1987). In this paper, we include the proportion of the firm's employees with university degrees as a proxy for employee education (Fernández-Olmos, 2011). Rather than evaluating the employees' experience in the industry, we try to measure their level of education since qualified workers are predicted to have more skills (than non-qualified workers) in order to develop a competitive management and quality production. The Spanish agri-business sector needs professionals who are able to introduce and develop advanced methodologies of quality management and food safety, process improvement or new product design so it can compete in the global market. For instance, Ameur and Gil (2003) obtained that the personnel qualification is a main factor explaining the Spanish agro-food firm decision to export.

Organizational experience is measured through a logarithmic transformation of the firm's age (Delios & Henisz, 2003; Bouquet, Hébert, & Delios, 2004; Majocchi, Bacchiocchi, & Mayrhofer, 2005). This log-transformation of the variable is based on the results of certain studies which find that newly established firms face more difficulties in overcoming export barriers due to a lack of organizational resources, managerial experience, and market and business knowledge (Majocchi, Bacchiocchi, & Mayrhofer, 2005). Firms need to obtain good pigs either by their own farms or relationships with providers, learning the particularities of the curing process, which tend to be transmitted from one generation to another, and developing a reputation in the industry. All these

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elements require time to be developed. Thus, it is considered that what is truly influencing SME export performance is not the absolute business experience of a firm but its relative change in experience.

Proximity to exporters

We measure the density of exporting firms located in the same geographical area, as has been used in previous studies (Clerides, Lach, & Tybout, 1998; Malmberg, Malmberg, & Lundequist, 2000; Barrios, Holger Gört, & Strobl, 2003; Bernard & Jensen, 2004; Lovely, Rosenthal, & Sharma, 2005; Greenaway & Kneller, 2008). For each firm, the present research estimates externalities by counting the number of other exporting Iberian ham producers within the same municipality (Costa-Campi & Viladecans-Marsal, 1999). A municipality is the smallest administrative structure in the political organization in Spain. The Iberian ham producers in Spain are based in 199 municipalities, which cover an average area of 169.66 sq. km. Since these municipalities are very varied in terms of the area they cover, from 7.51 sq. km to 1,750 sq. km, the number of establishments in each municipality is divided by its corresponding area.

Linkages with local institutions

Due to the lack of previous studies on Iberian institutions we reviewed documentation, asked different organizations (Iberaice[4], Food Planning Department at Environment and Rural and Marine Affairs, and the Technological Food department at the University of Cordoba) and request information from the surveyed companies. They pointed out the relevance of the following technological centres: Meat Technology Center (*Estación Tecnológica de la Carne*), located in Salamanca; Extremadura Agrifood Technology Institute (*Instituto Tecnológico Agroalimentario de Extremadura*) in Badajoz; Andalusian Technology Centre for the Meat Sector (*Centro Tecnológico Andaluz del sector Cárnico*) in Huelva; and the Valle de Los Pedroches Agrifood Research and Quality Center (*Centro de Investigación y Calidad Agroalimentaria del Valle de Los Pedroches*), in Córdoba. In the same vein, they have relationships with research groups from several universities: Salamanca, Caceres and Extremadura.

In addition, DOs play an important role in this population, as is true for most food sectors. Linkages to DOs help firms to sell their products because they impose strict common rules on producers and reduce uncertainty about the quality of their products. There are four different DOs: Dehesa de Extremadura, located in certain municipalities in Badajoz and Caceres; Guijuelo, in the north of Spain (Salamanca); Jabugo; and Los Pedroches, both in the south of Spain.

As a consequence, these linkages were measured using two dummy variables to indicate whether a firm has relations with the different institutions located in the cluster. Specifically, managers were asked whether they have relationships with technology centres and universities, that is, linkages with technology centres and universities, and/or with a DOs, or linkages with DOs.

Firm size

Size differences that exist among firms have been considered as a control variable. Larger firm have greater access to financial and managerial resources, which makes it easier to absorb the risks associated with exporting (Wagner, 1995). Firm size has often been measured in prior research using the number of employees (e.g., Erramilli & Rao, 1993). We adopt this measure in the logarithmic form in order to remedy the significant positive skew, which is evident for the pre-transformed count measure (Hessels & Terjesen, 2010). One employee might be insignificant in a midsize firm (50–250 employees) but could have a great importance for a micro firm (<10 employees).

[4] Iberaice is an Iberian ham association that brings together more than 90% of the Iberian ham producers.

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EMPIRICAL EVIDENCE

Results

A preliminary analysis was conducted to determine the relationships between pairs of independent variables. Table 1 shows the means and standard deviations of the variables as well as the Spearman's correlations[5] for each pair. In Table 2 we also run an ANOVA to compare the means of the independent variables among those firms that are exporters with those firms that only have domestic sales. The results confirm that mean values differences between exporters and non-exporters are statistically significant for R&D investments, marketing promotion investments, linkages with technology institutions and universities, linkages with linkages with DOs and firm size. In contrast, proximity to exporters, employee education and organizational experience do not seem to be different for exporters and non-exporters.

To test the hypotheses, we need an econometric model that determines the effects of internal resources and cluster variables taking into account two decisions: the decision of the firm to sell abroad or not, and second, whether the firm decides to export its export intensity. Since the export intensity is a limited dependent variable (with a range from 0 to 100) and 144 firms have an export intensity of 0, OLS might give biased results. Moreover, while some variables may affect the probability of becoming exporters, others may affect only the exporting intensity. If it is the case, a Tobit regression would give biased estimates. As a result, a Heckman selection model is used to solve these problems (Chevassus-Lozza & Galliano, 2003; Vermeulen, 2004).

The results for both decisions are presented in Table 3. The inverse Mills ratio (Heckman's λ) was statistically significant, which supports the use of a Heckman model to prevent biased selectivity. As can be observed, the probability of becoming exporters positively depends on firms R&D investments, marketing promotion, linkages with technology institutions and universities, linkages with DOs and firm size. On the other hand, the exporting intensity positively depends on firms R&D investments, marketing promotion and linkages with technology institutions and universities. Contrary to expectations, proximity to exporters, employee education and organizational experience have no significant influence on export performance.

DISCUSSION

Overall, we find that firms rely on both internal resources and local externalities to improve their export performance, so both the resource-based view and a cluster approach should be taken into account. From all the internal resources analyzed we have strongly confirmed the relevance of R&D expenditures in explaining export performance (Hypothesis 1). While several studies have confirmed this positive relationship between R&D intensity and exporting in manufacturing industries (Alvarez, 2004; López Rodriguez & García Rodriguez, 2005) it is interesting to confirm this relationship for traditional industries. In addition, firm marketing promotion are significant (Hypothesis 2). Marketing promotion is particularly relevant to attracting consumers for those goods where a quick inspection does not allow for the discovery of their real attributes and quality, as is the case for food industries.

However, employee education (Hypothesis 3) and firm organizational experience (Hypothesis 4) have no significant role on explaining export performance. Human resources has been viewed as more relevant variable in highly skilled activities and those that require interactions with customers (Bouquet, Hébert, & Delios, 2004; Contractor & Mudambi, 2008), which is not the case for Iberian

[5] The Kolmogorov–Smirnov test determined that the variables are not normally distributed, so we cannot use Pearson's correlations.

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Table 1. Spearman correlations

	R&D investments	*Marketing promotion*	*Employee education*	*Organizational experience*	*Proximity to exporters*	*Linkages with technology institutions and universities*	*Linkages with DO*	*Size*
R&D investments	1							
Marketing promotion	0.478**	1						
Employee education	0.183**	0.140*	1					
Organizational experience	0.118	0.017	0.009	1				
Proximity to exporters	−0.07	−0.151*	−0.04	0.021	1			
Linkages with technology institutions and universities	0.363***	0.306**	0.132*	0.061	0.045	1		
Linkages with DO	0.09	0.177**	0.080	0.005	0.123	0.206**	1	
Size	0.265**	0.202**	0.130*	0.192**	−0.065	0.260**	0.093	1

Notes. DOs = designation of origin.
***, **, * Significant at 1, 5, and 10% levels, respectively.

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Table 2. Descriptive analysis

	All firms		*Exporters*		*Non-exporters*		
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*F*
Export performance	2.29	5.79	5.42	7.91	0	0	
R&D investments	0.43	1.42	0.91	2.01	0.08	0.47	22.939***
Marketing promotion	1.56	4.04	2.78	5.83	0.67	1.24	17.835***
Employee education	10.94	12.53	11.55	10.51	10.49	13.85	0.435
Organizational experience	2.94	0.54	2.97	0.51	2.92	0.56	0.617
Proximity to exporters	0.66	0.91	0.62	0.91	0.69	0.91	0.309
Linkages with technology institutions and universities	0.28	0.45	0.42	0.50	0.17	0.38	20.477***
Linkages with DOs	0.44	0.50	0.56	0.50	0.35	0.48	11.290**
Size	2.39	1.00	2.75	0.94	2.13	0.96	25.771***
N firms	250		106		144		

Notes. DOs = designations of origin.
***, **, * Significant at 1, 5, and 10% levels, respectively.

Table 3. Determinants of export performance: Heckman regression

	Probability of export		*Export intensity*	
	Coefficient	*Marginal effects*	*Coefficient*	*Marginal effects*
R&D investments	0.315** (0.140)	0.125** (0.056)	1.320** (0.599)	1.320*** (0.599)
Marketing promotion	0.162*** (0.063)	0.064*** (0.025)	0.614*** (0.213)	0.614*** (0.213)
Employee education	0.002 (0.007)	0.001 (0.003)	0.013 (0.074)	0.013 (0.074)
Organizational experience	0.006 (0.167)	0.003 (0.066)	0.204 (1.617)	0.204 (1.617)
Proximity to exporters	−0.063 (0.102)	−0.025 (0.041)	−0.271 (0.924)	−0.271 (0.924)
Linkages with technology institutions and universities	0.347* (0.209)	0.138* (0.082)	4.874** (2.096)	4.874*** (2.096)
Linkages with DOs	0.384** (0.183)	0.152** (0.072)	0.646 (1.986)	0.646 (1.986)
Size	0.303*** (0.099)	0.120*** (0.039)	0.821 (1.268)	0.821 (1.268)
Constant	−1.473*** (0.541)		−9.371 (9.117)	
Lambda	Prob > χ^2 = .000, Prob > *F* = .000, Adjusted R^2 = 0.216, Pseudo R^2 = 0.069			

Notes. Standard errors in parentheses. The dependent variable is the internationalization degree. Number of observations = 250.
DOs = designations of origin.
***, **, * Significant at 1, 5, and 10% levels, respectively.

ham products. The lack of relevance for organizational experience can imply that firms do not need to learn about the industrial activities and practices in domestic markets before becoming exporters. It is possible that firms in traditional industries, and as well as those in high technology ones, are starting to export without first gaining this experience (Majocchi, Bacchiocchi, & Mayrhofer, 2005). In addition, it could be that young firms try to develop new markets while older firms keep in their traditional and local ones, as extending their sales would require important investments and developing new capabilities.

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Contrary to our hypothesis, proximity to resources, information and knowledge from other exporters does not seem to increase local exports (Hypothesis 5). While some previous studies have found a positive effect (Clerides, Lach, & Tybout, 1998; Chevassus-Lozza & Galliano, 2003; Lovely, Rosenthal, & Sharma, 2005; Greenaway & Kneller, 2008); others have found no significant effect (Aitken, Hanson, & Harrison, 1997; Bernard & Jensen, 2004) or even a negative one (Bernard & Jensen, 2004). A plausible explanation for this lack of relevance could be that when firms increase their international presence they simultaneously reduce their local interactions (Keeble et al., 1998; deMartino, McHardy Reid, & Zygliodopoulos, 2006).

Moreover, exporters that participate in local interactions can fear of intangible resource leakages benefiting other proximate firms. As it has been tested, exporting firms develop internal resources to improve their international competitiveness. However, it could be that these efforts, along with benefiting the firm, spill over to local firms. In particular, it has been found out the local community that configures the cluster makes easier for firms to learn about the innovations carried out by exporters (Beaudry & Breschi, 2003); the international reputation is spread locally (Chung & Kalnins, 2001); the required skills of employees and managers can more readily be found in local labour markets (Brunello & Gambarotto, 2004); and the organizational experience can be more easily transmitted (Schwens & Kabst, 2009). The lack of significance of both employee education and organizational experience that has been identified in this research could be understood as a confirmation of this point. For instance, firms do not invest highly in preparing personnel internally as human resources are easily available in the cluster, or at risk of migrating to other cluster firms.

In addition, firms that have developed linkages with technological institutions and universities have a higher probability of becoming exporters and, once they export, of increasing their overseas sales (Hypothesis 6). It has been recently argued that excessive dependence on local interactions can cause a lock-in effect for firms that reduce their international competitiveness. In order to avoid this problem, international firms would then reduce their local relations and establish new ones with agents from outside the cluster (deMartino, McHardy Reid, & Zygliodopoulos, 2006). Nevertheless, the results of this research are consistent with previous literature that found competitive advantage differences among clustered firms due to linkages with local institutions that encourage an exchange of knowledge and information (McEvily & Zaheer, 1999; Molina-Morales & Martínez-Fernández, 2004).

Finally, the variable that measure linkages with local DOs (Hypothesis 7) was significant. Several studies on the food industry have pointed out the relevance of DOs for increasing the collective reputation and international presence of firms (Menard, 1996; Benjamin & Podolny, 1999; Lamprinopoulou & Tregear, 2006). However, these linkages only help Iberian ham producers to become exporters. In particular, it seems that once firms become exporters, they increase their sales in international markets by relying more on their own reputation and image than on the collective one, useful for becoming an exporter.

CONCLUSIONS AND AREAS FOR FUTURE RESEARCH

In this research we consider that firms can improve their export performance both by developing intangible resources and by taking advantage of local externalities from a cluster. Intangible resources increase a firm's export performance because they are valuable and can be leveraged across different markets without limitations on use. In particular, it was found that firms developing resources for innovation, by investing in R&D, or for individual reputation, by high marketing investments, improve their export performance.

These results contribute to existing literature by identifying a complementarity between these internal resources and those externally obtained from the cluster. In particular, firms can rely on

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external linkages with technology institutions, universities and DOs institutions to also increase their export performance. By establishing relationships with technology centres and universities, firms can have access to valuable information and knowledge about new products or processes that may reduce their costs or increase the quality or adaptability of their products. In addition, DOs confer a collective reputation that increases their international visibility and reduces opportunism risk among firms. Rather than assuming that all firms can benefit the same from the cluster, we confirm that there are differences in cluster networks that should be taken into account.

However, some of the results obtained can be considered as a limitation of this research and would need further investigation. Contrary to the hypothesis, employee education, a firm's previous experience and proximity to exporters have no significant effect on export performance. Further research could look further at the role of employee education in exporting firms. It would be appealing to examine in greater depth how higher employee turnover in proximate firms may also affect the relevance of a local firm's employee education in explaining export performance (Almeida & Kogut, 1999). In particular, it would be interesting to evaluate the role of previous employee experience in the industry on export performance.

It is surprising that producers can start to export regardless of their previous experience in the industry. Recent papers have noted a growing presence of young firms that are able to become exporters mainly due to their ability to take advantage of local relationships with other exporters. Nevertheless, in this research it would seem as if information, knowledge and resource leakages from exporters to neighbouring firms do not affect export performance. Taking into account these results, future research could focus on younger exporting firms as they might have a higher capacity to learn knowledge and information from others (Lotia, 2004; Greenaway & Kneller, 2008). It could be hypothesized that younger firms have a more active participation in external knowledge flows, as they have both: more knowledge about international markets and industry particularities to learn and more capacity to learn due to their internal organization.

Nevertheless, this study may provide some insights into issues affecting SME managers when making export decisions: first, firms that become exporters can exploit valuable intangible resources, whatever their previous experience in the industry. Second, these internal resources are reinforced by their position inside clusters so firms can use national linkages to improve their international competitiveness.

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