Simultaneous Effects Between Innovativeness and Export Behavior in Small Firms: Evidence From Spain

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7. Simultaneous effects between innovativeness and export behavior in small firms: evidence from Spain

Izaias Martins, Alex Rialp-Criado and Yancy Vaillant

INTRODUCTION

It is generally agreed that export activities are an important issue at the micro-level for the growth and expansion of a business (Knight and Cavusgil, 2004; Leonidou and Katsikeas, 1996), as well as at the macro-level for the generation of wealth for the nation (Da Rocha et al., 2009; Roper and Love, 2002). Unsurprisingly, it is one of the most popular topics in business management and international entrepreneurship (IE) literatures (e.g., Cassiman and Golovko, 2011; Golovko and Valentine, 2011; Kirbach and Schmiedeberg, 2008; Lages et al., 2009). In turn, there is a consensus in strategic management and IE that one of the keys to generate a competitive advantage in a global economy is through innovativeness (Alpay et al., 2012; Filipescu et al., 2013; Flor and Oltra, 2005; Hagen et al., 2014; Prasad, 2004; Rhee et al., 2010; Tajeddini et al., 2006). Innovativeness reflects the propensity of a firm to actively support new ideas, novelty, experimentation and creative solutions in pursuit of a competitive advantage (Hult et al., 2004; Lumpkin and Dess, 1996). Nowadays most small firms seem to get into the international market more rapidly than before (Andersson et al., 2004), and they are more concerned with adopting strategies that involve activities in the foreign marketplace (McDougall and Oviatt, 2000; Rialp et al., 2005).

In the European business context, usually characterized by small domestic markets associated with the situational uncertainty due the current economic crisis, several economies are facing difficulties due to recessions in their domestic markets. Thus, one of the avenues for small firms to gain market share and ensure their survival may be in operating abroad (Dejo-Oricain and Ramírez-Alesón, 2009). In this sense, a study of Spanish small firms could help to extend the knowledge in this research field. Spain is among the European Union's largest economies; however, it is one of the countries most affected by the current crisis. In

addition, its international presence through exports is relatively weak, perhaps caused by the low levels of innovativeness culture (Monreal-Pérez et al., 2012).

Especially nowadays, firms must explore the interaction between innovativeness and export activities. Many scholars examined the relationship between innovativeness and export behavior (e.g., Caldera, 2010; Cassiman and Golovko, 2011; Kirbach and Schmiedeberg, 2008; Lachenmaier and Wobmann, 2006), or even, the complementarity between innovativeness and export for SMEs' growth (Golovko and Valentine, 2011). However, most prior research on this topic focuses on specific aspects of innovation rather than the innovativeness culture, or even present an interchangeable use of the constructs 'innovation' and 'innovativeness' (Garcia and Calantone, 2002), resulting in a lack of consistency in operationalizing these constructs.

Thus, this study contributes, extends, confirms and/or contradicts the current debate around this research topic. We also highlight the more ample existence of single-sided rather than double-sided research looking at the innovativeness–export relationship. The former is often limited to cross-sectional studies (considering only a year). Furthermore, there are few studies examining separately each dimension of innovativeness and their impacts on firms' exports. In addition, while it is generally agreed that innovativeness contributes to business performance, relatively little is known about the drivers of innovativeness (Hult et al., 2004).

Consistent with the resource- and learning-based views, we focus on the relationship between innovativeness and export activity. Thus, this allows us to contribute to the literature by examining the impact of small firms' innovativeness on the decision to operate abroad, as well as on their export performance. At the same time, and equally as important, we draw on learning-by-exporting (Salomon and Shaver, 2005). Hence, our study responds to calls by scholars who have encouraged more research on the role of export propensity on firm innovativeness (e.g., Damijan et al., 2010; Salomon and Shaver, 2005). Furthermore, we theoretically contribute to the discussion on the differences between innovation and innovativeness that generate confusion and sometimes an interchangeable use of these constructs.

The remainder of this chapter is organized as follows: Section 2 provides the theoretical framework, a brief overview of previous studies and the hypotheses proposed; Section 3 specifies the research design and describes the main data sources; Section 4 presents the estimation results; and Section 5 provides a discussion and concluding remarks.

THEORETICAL FRAMEWORK, PREVIOUS RESEARCH AND HYPOTHESES

Clarifying Innovation and Innovativeness Concepts

As we mentioned above, the plethora of definitions for innovation types is confusing and has resulted in an ambiguity in the way the terms innovation and innovativeness are used. The result is an interchangeable use of these constructs to define innovation types (Adams et al., 2006; Garcia and Calantone, 2002; Kamaruddeen et al., 2009). In order to achieve distinctions between innovation and innovativeness we reflected on different aspects such as the stages of the innovation process – initiation and implementation suggested by Zaltman et al. (1973), the degree of newness of an innovation (Freel, 2005; Roehrich, 2004), or even, the time and degree of adoption of the current technology (Fell et al., 2003).

Although a certain degree of overlap between those concepts may exist (Damanpour, 1991) it is possible to point out some distinctions. Moreover, while the concept of innovation is widely dealt with in research, the definition of innovativeness is rarely discussed (Tajeddini et al., 2006). It happens perhaps because while the definition of innovation is less problematic for research that examines a single innovation such as product or service (where the objective is simply to demonstrate that the phenomenon being studied is an innovation), it becomes more problematic when examining the concept of innovativeness because it is concerned with the full range of innovations developed (Emsley, 2005). Thus, in order to understand innovativeness, it is necessary to discuss the concept of innovation first.

From an overall perspective, the term 'innovation' can be defined as an iterative process initiated by the perception of a new market opportunity for a product or service created through a technology-based process, which leads to development, production and marketing tasks (OECD, 1991). In a complementary way, innovation is the generation, acceptance and implementation of creative ideas within an organization (Hurley and Hult, 1998). In this sense, Garcia and Calantone (2002) pointed out that this iterative character implies varying degrees of innovations and thus it is important to elucidate that an innovation does not necessarily imply the creation of something unique. Furthermore, many companies have taken an innovation strategy of improving upon existing products or technologies, called incremental innovation. Therefore, the implementation of an innovative product or service does not automatically imply highly innovative firms (Garcia and Calantone, p. 117).

On the other hand, an important part of the initiation stage is 'openness

to the innovation' (Zaltman et al., 1973, p. 64), which is determined by whether the different actors within an organization are committed to considering the adoption of or are resistant to innovation. In this sense, innovativeness is the notion of openness to new ideas as an aspect of a firm's culture (Hurley and Hult, 1998). However, according to Tajeddini et al. (2006), there is no real consensus on the meaning of innovativeness, because it is a multidimensional, composite variable made up of perceptual measures such as 'radicalness', or operational measures like 'innovations adopted' (Roehrich, 2004). Additionally, innovativeness also might be related to the time of adoption, namely, the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas, concepts, systems and products than any other competitor (Rogers, 2003; Subramanian and Nilakanta, 1996).

Innovativeness is most frequently used as a measure of the degree of newness of an innovation. Innovativeness is 'possession of newness' (Roehrich, 2004), or the degree of newness of a product (Freel, 2005; Gatignon and Xuereb, 1997). Highly innovative products or services and innovative processes are seen as having a 'high degree of newness' (Garcia and Calantone, 2002, p. 112).

In sum, the innovativeness concept gives a more complete reflection and embraces a range of innovations adopted in a given time period (Damanpour, 1991; Tajeddini et al., 2006). By considering these arguments, for the purposes of this research, the term innovativeness is seen as the creation and possession of newness, thus depicting a firm's skill to create and launch new products, its ability to develop new process innovations and the possession of products and services that are either totally new or radically different from existing products (uniqueness).

Innovative Capability as a Resource: From Innovativeness to Foreign Markets

In the resource-based view (RBV) perspective, the capacity of firms to generate sustained competitive advantages – which means advantages that derive from the resources and capabilities that are valuable, scarce, inimitable and non-substitutable (Barney, 1991) – depends on their particular set of resources These resources and capabilities can be viewed as bundles of tangible and intangible assets, including business skills and knowledge (Barney et al., 2001). Thus, the best way to understand a firm is by considering it as a collection of productive resources specific to each firm, which allows it to compete successfully against other firms (Penrose, 1959). Considering that SMEs suffer from the structural phenomenon labelled 'liability of smallness' (Gassmann and Keupp, 2007) they cannot

be presumed to be well endowed with tangible assets. Thus, the crucial resources of SMEs, such as knowledge, are essentially intangible. In the context of innovativeness, RBV helps to explain how knowledge and the resultant organizational capabilities are developed and leveraged by firms (Knight and Cavusgil, 2004). The knowledge-based view (KBV) has emerged from the RBV by focusing on intangible resources, rather than on physical assets (Gassmann and Keupp, 2007, p. 353). The differential endowment of resources is an important determinant of organizational capabilities and performance (Barney, 1991; Teece et al., 1997). Indeed, organizational capability is the outcome of knowledge integration (Grant, 1996). It points out that innovative capability does not come from exploiting external technologies, which are easily accessible for competitors and therefore insufficient for sustaining a competitive advantage but rather it comes from the generation of internal innovation by generating new resources and building basic technological competences (Barney, 1991), as well as accumulating intangible resources, namely, knowledge (Prashantham, 2005). In addition, technological resources can generate a double competitive advantage for a firm, in lowering costs by creating new and more efficient production processes, and in differentiation by means of product innovations (López Rodríguez and García Rodríguez, 2005).

In international business, knowledge provides particular advantages that facilitate foreign-market entry and operations (Johanson and Vahlne, 1991; Knight and Cavusgil, 2004). Namely, knowledge about international markets, as well as the efficiency by which such knowledge is learned and used to achieve intended ends is an important determinant of success in entrepreneurial firms (Autio et al., 2000). In this vein, innovating firms develop their own unique knowledge and dynamic capabilities that engender organizational performance in fast-moving global environments (Al-Aali and Teece, 2014) and, therefore, new product market development in innovative firms is fluid and dynamic, with ongoing market expansion (Eiriz et al., 2013). Likewise, firms leverage technology to innovate in the creation and improvement of products, as well as the adaptation of products for foreign markets which can also drive the global market entry (López Rodríguez and García Rodríguez, 2005). Moreover, as emphasized by Rialp et al. (2005, p. 160), one of the factors that appear to engender or facilitate a firm's early internationalization is precisely 'high value creation through product differentiation, leading-edge technology products, and technological innovativeness'.

When firms begin their internationalization process, they typically move through different stages, such as exporting operations, joint venturing or foreign direct investment, among others. In this study, we concentrate our analysis only on export activities (i.e., when we talk about international

activities, we are referring exclusively to exports, export propensity referring to the act of engaging in exporting and export intensity referring to the proportion of overall sales destined abroad). Particularly for small firms, export activity is the most important strategy for internationalization (Knight and Cavusgil, 2004; Leonidou and Katsikeas, 1996). In turn, the innovativeness might be an important factor in explaining the entry into the export market (Basile, 2001; Cassiman and Golovko, 2011).

Conceptually, an innovative strategic posture is thought to be linked to firm performance (Alpay et al., 2012; Eiriz et al., 2013) because it increases the chances that a firm will realize first-mover advantages and capitalize on emerging market opportunities (Wiklund, 1999). Innovative firms, through the creation and introduction of new products and technologies, develop a market niche with new products/services, differentiate themselves and/or substitute incumbents with better quality, cheaper prices or other means that customers value (Richard et al., 2009; Wiklund and Shepherd, 2005). Innovativeness could be recognized as a key success factor in an increasingly competitive, global economy (Akman and Yilmaz, 2008; Prasad, 2004). In this way, there is a large volume of empirical literature testing the effect of innovative activity on international business (e.g., Cassiman and Martínez-Ros, 2007; Kirbach and Schmiedeberg, 2008; Lachenmaier and Wobmann, 2006; Podmetina et al., 2009; Roper and Love, 2002; Wakelin, 1998).

For instance, Podmetina et al. (2009) highlighted the importance and the significant impact of innovativeness, competition and new products development on the internationalization, as well as on export intensity, of companies in Russia. In the same way, Kirbach and Schmiedeberg (2008) have offered an interesting analysis of export behavior, when comparing firms in West and East Germany. Their estimations confirmed a strong relationship between innovativeness and international operations, as well as structural differences, between West and East German firms.

In the context of Southern Europe, studies have mostly focused on innovation, defined as a result, rather than the more behaviorally defined concept of innovativeness. In fact, the last ten years have seen a proliferation of studies attempting to explain the innovation–export relationship. For example, Caldera (2010), using compiled data from the Encuesta sobre Estrategias Empresariales (ESEE)–Spain, stressed a positive effect of firm innovation on the probability of participation in export markets. In turn, using Spanish manufacturing data, López Rodríguez and García Rodríguez (2005) stated that product innovations, patents and process innovations have positive and significant effects on both the decision to export and international business intensity. Likewise, Cassiman and Martínez-Ros (2007) stressed the importance of innovation on exports

and pointed out that product innovations are a more important determinant of export growth, while process innovations are a more important driver of export propensity. More recently, Cassiman and Golovko (2011) emphasize that product innovation improves productivity levels, which pushes firms to enter the export markets, as well as being directly related to the probability of export in a firm's operations. According to these findings, it can be posited that the link between innovation and exports begins with innovativeness, described as the firm's proactive behavior from which innovation may result. The following hypotheses are therefore formulated:

H1a: The greater innovativeness of the firm, the more likely its export propensity.

H1b: The greater innovativeness of the firm, the higher its export intensity.

Learning-by-exporting: From Export Activities Toward Innovativeness

There is growing recognition about the relationship between innovativeness and export activities. Likewise, recent literature on IE has followed this line of research, but analyzes the reverse relationship or even the reciprocity between both innovativeness and export activities. Hence, at the same time, the effects of export activity on firms' innovativeness might be investigated from the perspective on learning-by-exporting. It is acknowledged that the ability of a firm to recognize the value of new and external knowledge with an absorptive capacity (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998; Zahra and George, 2002) is a critical component to learning and innovativeness. Moreover, the knowledge-based view of the firm states that innovativeness is an information- and knowledge-intensive process. Thus, in order to be creative and make the difference, firms need to access and retrieve information from as many sources as possible, including different countries (Kafouros et al., 2008).

In this research, we try to be consistent with prior studies (Eriksson et al., 1997; Monreal-Pérez et al., 2012; Sapienza et al., 2005) assuming that firms can increase their innovativeness by improving the process of knowledge accumulation and by increasing organizational learning (Kafouros et al., 2008). Thus, companies may learn directly from foreign-market experience and indirectly via observation of foreign companies (Johanson and Vahlne, 1991). External contacts can help firms learn new capabilities and may provide access to resources and knowledge (Anand and Khanna, 2000; Chetty and Wilson, 2003; Stoian et al., 2011). That is, firms could learn from foreign markets and their foreign presence (Sapienza et al., 2005).

However, to which extent does export activity make companies more innovative? Specifically, is it possible to have or achieve a positive effect of export intensity on a firm's innovativeness? Consistent with the learning-based view, obviously this is a potential option. Despite not having extensive literature examining the reverse relationship, some authors stress that international trade makes firms more innovative (e.g., Filipescu et al., 2009; Podmetina et al., 2009; Salomon and Shaver, 2005), perhaps because these companies must innovate to remain in foreign markets (Hitt et al., 1997). Furthermore, international firms can leverage their networks around the world to hire better technologists and access skilled technical expertise (Kafouros et al., 2008). Likewise, internationalized firms tend to transfer their experience from international operations into increased innovativeness in the domestic market (Filipescu et al., 2009; Molero, 1998). In this way, several authors agree with the statement that 'the fact of developing international activities has influenced, in a positive way, technological innovation' (Filipescu et al., 2009, p. 147). Furthermore, these two features (internationalization and the innovativeness) reinforce each other to the extent that today's economic analysis has to consider both of them simultaneously when trying to account for any new dynamic of the firms operating at the international level (Molero, 1998).

Therefore, consistent with the learning-by-exporting view, and in accordance with previous research, the following hypothesis can be addressed:

H2: Export propensity positively affects a firm's innovativeness.

RESEARCH DESIGN

Database

In this study, we use data from the Global Entrepreneurship Monitor (GEM) adult population survey (APS) collected for the years 2007 and 2008 in Spain. The GEM research program is an annual assessment of the national levels of entrepreneurial and business activity. Initiated in 1999 it is the single largest study of entrepreneurial activity in the world cumulating nearly 100 national research teams as of 2014. The main advantage of the GEM database is the fairly large sample size, in addition to consistency in definition and measures across multiple contexts. Thus, besides its external validity, the use of the GEM dataset allows understanding of business and entrepreneurial activity across time and space.

The main research instrument of GEM data collection methodology is

the adult population survey (APS); the same used in this study. The GEM APS dataset satisfies the definitional requirements of this study. It uses a consistent set of factors and definitions across multiple contexts that can be used to establish external validity of findings. The GEM APS questionnaire has been developed taking into consideration theoretical perspectives and previous empirical findings as well as practical considerations (Reynolds et al., 2005; Levie and Autio, 2008). The countries that participate in the GEM research project have a national team of researchers that oversee the work in their respective countries. This database has been extensively used by researchers across the world (see Amoros et al., 2013; Bosma, 2013).

The sample was selected through multiple sampling. In the first stage, a random sample of municipalities divided according to population quota was selected. This was followed by the selection of a random sample using the random digit dialing (RDD) technique of both fixed and mobile telephone number from the telephone directory (annually updated 'Espana Office v5.2' database). In the third stage individuals in the age group between 18 and 64 years were randomly selected using the birth method to select the within-household respondents. The selected respondent is asked four screening questions and depending on their response to these four questions, the respondents are further asked questions about their involvement in the type and nature of business activities. Finally, information on some profile variables is collected from all respondents. In case of nonresponse, the same telephone number is contacted again and this process is repeated until the suitable respondent is contacted. Once the data from the target number of selected respondents are obtained, the dataset is weighted by gender, age group and habitat (rural–urban). The third party marketing research agency selected by the Global Entrepreneurship Research Association (GERA) (the technical committee of GEM overseeing the Global GEM project), collects the data, normally during May–July of each year as per the GEM guidelines.

The GEM database is considered suitable for this study because it contains all the variables relevant for analyzing the hypothesized relationships. From the original survey we identify the subset of those who are classified as firm owner-manager/s (corresponding to people who declared owning and managing a business). Thus, the final sample included usable responses from 977 (2007) and 1449 (2008) firms. The characteristics of the sample are similar for both years. The reporting companies had a mean of 5.66 employees (2007) and 4.72 employees (2008), and about two-thirds of the companies operated only on the domestic market, while the remaining third had at least 1 percent of their total sales from exports. Full sample characteristics are depicted in Table 7.1.

Table 7.1 Firm characteristics

		2007		2008	
		N	%	N	%
Export					
Export propensity	Export	391	40.02	544	37.54
	No export	586	59.98	905	62.46
Export intensity	Low	244	62.40	349	64.15
	Medium	62	15.86	75	13.79
	High	85	21.74	120	22.06
Innovativeness					
Products or services	New to all or some	398	40.74	580	40.03
Innovativeness	Not new	579	59.26	869	59.97
Process	Less than 5 years	333	34.08	471	32.51
Innovativeness	More than 5 years	644	65.92	978	67.49
Uniqueness of product or service	Product's distinctiveness	295	30.19	413	28.50
	No distinctiveness	682	69.81	1036	71.50
Firm-specific characteristics					
Size	1–9 employees	842	86.18	1266	87.37
	10–49 employees	135	13.82	183	12.63
Age	Less than 10 years	376	38.49	568	39.20
	More than 10 years	601	61.51	881	60.80
Industry	Extractive	89	9.11	155	10.70
	Manufacturing	331	33.88	481	33.20
	Service	167	17.09	222	15.32
	Consumer-oriented	390	39.92	591	40.79

Variables

Export propensity

A dichotomous variable was used with the aim of identifying the companies with some experience selling in foreign markets. Thus, the variable measures whether the firm has an export-oriented behavior or not. If 1 percent or more of the sales goes abroad, this variable assumes the value of 1. Otherwise, if the firm does not sell abroad, this variable assumes the value of 0. Several authors have used a similar measurement (e.g., Calof, 1994; Estrin et al., 2008; Gonzalez-Pernía and Peña-Legazkue, 2011; Zhao and Zou, 2002).

Export intensity

It is the dependent variable in the first part of our analysis. This variable corresponds to the foreign sales rate divided by the total sales in a given

period (Pan and Chi, 1999). In fact, according to Katsikeas et al. (2000), this is the main criterion to measure export performance. Thus, we create a categorical variable that assumes the value of 1 if the company does not export (null export propensity), a value of 2 if the rates of exports are between 1 percent and 25 percent (low), value 3 if the rates of exports are between 26 percent and 50 percent (medium), and a value of 4 if the rates of exports are 51 percent or more (high). Our classification is supported in Acs and Amorós (2008), who capture the importance of 'entrepreneurial export orientation' considering as a 'relatively high foreign market rate' more than 50 percent of customers in other countries. The purpose is to generate an ordinal classification attempting to identify firms that do not export, and firms with an increasingly significant proportion of their revenues derived from foreign sales.

Innovativeness

There are several methods by which to classify innovation, and the research by Downs and Mohr (1976) could be a good example; however, innovativeness is more accurately represented when multiple, rather than single, innovations are considered (Damanpour, 1991). It examines the whole range of innovations developed (Emsley, 2005; Tajeddini, 2006). The most useful classification of innovativeness is through product market innovation and technological innovation (Lumpkin and Dess, 1996). In other words, innovativeness is the predisposition to engage in creativity through the introduction of new products or services as well as technological leadership via R&D in new processes.

The innovativeness construct is part of the GEM-available information and its dimensions refer to the poise of an organization to develop creative or novel internal solutions or external offerings (see Reynolds et al., 2005). The questions concerning firm innovativeness indicate: (i) the level of effort made by a firm in an attempt for all, some or none of its current and potential customers to perceive its products and/or services as being more or less innovative (i.e. the degree of effort put by the firm in achieving product/service novelty according to its customers' perceptions); (ii) the extent to which the firm's processes – technologies and/or procedures – required by these products or services become generally available in the market sooner or later; and (iii) the uniqueness or distinctiveness of products or services, namely, the firm's capability of offering products and services that are either "totally new" or "radically different" from already existing competitors' products or not (Sharma and Blomstermo, 2003).

Considering the available information in the GEM database, we used this innovativeness concept in two different steps: First, innovativeness

was treated as an independent variable. Therefore, in order to assess the level of innovative behavior shown by every firm in the sample, a categorical variable for each innovativeness item was created. We measured the variable *product or service innovativeness* in terms of a firm's level of effort (assuming the value of 1 for high effort, 2 for low effort, and 3 for non effort) in order to achieve that its products and/or services were actually perceived as mostly new and unfamiliar by all, at least some or none of its customers, respectively. Likewise, the variable *process innovativeness* assumes a value of 1 for companies which apply emerging technologies available less than one year ago (extremely new), a value of 2 for companies using technologies available between one and five years ago (new), and a value of 3 for companies using older technologies generally available in the market more than five years ago (not new). Regarding the *uniqueness of products or services*, we used a dichotomous variable to measure the distinctiveness of a firm's offer. It assumes a value of 1 when there are not other businesses – or only very few – offering the same or very similar product or service to their potential customers, and a value equal to 0 if there are many other businesses offering essentially the same product or service to them.

Second, innovativeness was also used as a dependent variable. In this case, *product or service innovativeness* and *process innovativeness* were re-labeled, and a dichotomous variable was created for each innovativeness item. Thus, *product or service innovativeness* assumes the value of 1 for those firms showing a certain level of innovative effort (either high or low) in their attempt to generate products or services seen as rather new and unfamiliar by all or at least some of their customers; otherwise, they assume the value of 0. Likewise, *process innovativeness* assumes the value of 1 for firms using emerging (extremely new) or new technologies available in the market for less than five years; otherwise, they assume the value of 0.

Control variables

Firm size We first include a variable to capture size as an internal resource, considering that firm-specific factors might provide firms with a competitive advantage (Barney, 1991). Thus, firm size is expected to have a positive relationship to exports because larger firms have more resources with which to enter foreign markets (Fariñas and Martín-Marcos, 2007; Wakelin, 1998). In the same way, firm size is expected to have a positive relationship to firm innovativeness. Firms might have an excess workforce capacity with which to produce new products (Salomon and Shaver, 2005). Furthermore, innovative exporters tend to be larger than non-innovative

ones (Damijan et al., 2010). Size was measured by the natural log of the number of employees (Andersson et al., 2004; Cassiman and Golovko, 2011) reported in the year of the GEM survey.

Firm age We measured firm age as the number of years that the firm has been operating (Caldera, 2010; Monreal-Pérez et al., 2012). Firm age is an additional characteristic that may differ between exporters and non-exporters. Exporters are usually older than non-exporters (Fariñas and Martín-Marcos, 2007). Age has been introduced to the model in logarithmic form.

Industry We control for industry sector because firms in specific industries may be more inclined to exporting or innovativeness. Likewise, firms in more knowledge-intense industries may be more inclined to exert learning effort (Sapienza et al., 2005). For instance, we expected consumer product-oriented firms to develop more new products (Salomon and Shaver, 2005) and bet on new technologies. The dataset assigned four standard categories that are derived from the standard industrial classification – SIC code (extractive, manufacturing, business service and consumer oriented). The industry variable was coded with categorical variables, and extractive is the omitted category serving as the base case in regression analyses.

ANALYSIS AND RESULTS

The Choice of Specification

The overall aim of the study is to examine whether a firm's innovativeness affects its export activity (in terms of export propensity and export intensity), and whether its export propensity affects innovativeness. In order to meet this overall aim, we address two main research issues. First, we investigate the influence of innovativeness on the internationalization of small firms through export activities, and how innovativeness and uniqueness in products or services as well as process innovativeness affects the proportion of foreign sales (export intensity). The second research issue is to investigate whether firms with export propensity (those which have a positive proportion of foreign sales) show higher innovativeness in products or services, as well as in processes (more recent availability of new technology or procedures necessary to develop their activities). As stated in Section 3, by using data from two years, we have provided some evidence from cross-sectional analyses of 2007 and 2008.

Tables 7.2 and 7.3 show means, standard deviation and correlation between the variables. As can be observed, the magnitude of the correlation between independent variables in both ordinal and logit regression models do not represent problems of multi-collinearity. In fact, the correlation between innovativeness in products or services and process innovativeness was expected, the correlation value being significant but not too high.

Innovativeness and Exports

In order to test Hypotheses H1a and H1b, we applied an ordinal logistic model (OLM). Given that the multinomial regression model ignores any ordering of the values of the dependent variable, and our dependent variable presents a clear ordering of the values, we apply a model that incorporates the ordinal nature of the dependent variable. In the ordinal logistic model, the event of interest is observing a particular score. For example:

$$rating_1 = prob(score\ of\ 1)/prob(score\ greater\ than\ 1)$$
$$rating_2 = prob(score\ of\ 1\ or\ 2)/prob(score\ greater\ than\ 2)$$
$$rating_3 = prob(score\ of\ 1,\ 2\ or\ 3)/prob(score\ greater\ than\ 3).$$

The last category does not have an odds associated with it since the probability of scoring up to, including the last score, is 1. Thus, defining the event, we can write the equation as:

$$Ø_j = prob(score \leq j)/prob(score > j).$$

Table 7.4 presents the estimated coefficients for the model. The estimates labelled *rating* are the threshold (the intercept equivalent terms), and it is possible to observe an increasing estimated coefficient according to increasing the scale.

As for the control variables, it is observed that firm size is significant with a positive sign in every test. With respect to the firm age, findings confirm that age is positively related to export activity only in 2008. For a continuous variable, a positive coefficient means that as the values of the variable increase, the likelihood of larger scores increases as well.

As expected, especially the size of the company increases the probability of having higher export activities. These results are consistent with previous research (e.g., Monreal-Pérez et al., 2012), 'exporters tend to be larger than non-exporters' (Salomon and Shaver, 2005, p. 440). In regard to the industrial sector; however, only a marginally significant difference has been observed among these four standard categories.

Table 7.2 Summary statistics and correlation for key variables: ordinal regression 2007 and 2008

Variables	2007								
	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) i.prod/serv.	1.637	0.9385	1.00						
(2) proc.innov.	1.543	0.7217	0.124***	1.00					
(3) exp.inten.	1.446	0.6694	0.096**	0.114**	1.00				
(4) uniqueness	0.301	0.4593	0.073**	0.135***	0.031	1.00			
(5) employeesln	1.098	0.9797	0.081**	0.080**	0.039	–0.036	1.00		
(6) ageln	2.482	0.6637	–0.045	–0.058*	–0.037	0.004	–0.008	1.00	
(7) industry	2.878	1.043	0.060*	0.062*	–0.002	–0.001	–0.010	–0.075**	1.00

Note: $*p < 0.05$; $**p < 0.01$. ^{ln} logarithmic form.

By observing the innovativeness variables, in each relationship we can verify that there is a significant positive influence on export intensity. Thus, the results for many of the variables are as expected. Considering the role of the product/service innovativeness, our findings show that which make some innovative efforts – either higher or lower – to convince more customers to recognize the company's output as new and unfamiliar to all or at least some of them (product/service novelty), as compared to those which do not apply any significant effort (omitted category), raise their probability of exporting (export propensity) and mostly increase their export intensity. Looking at the findings in 2007 and 2008, the coefficients are very similar and in both years confirm a positive relationship. For instance, (2007: high effort = 1.611 $p < .01$; low effort 1.447 $p < .05$ and 2008: high effort = 1.660 $p < .01$; low effort 1.512 $p < .01$). Regarding the use of more or less up-dated technology (*process innovativeness*), we also found a positive influence on export activities. Namely in small firms whose technologies or procedures to perform their activities were more recently available, especially less than a year ago, the result was as expected. For instance, looking at the result in 2007 (extremely new = 1.451 $p < 0.05$). Equally as important, there are statistical differences between businesses with process technology generally available less than five years ago versus more than five years ago (older available technologies taken as the omitted category) in regard to exporting. For instance, looking at the result in 2008 (new = 1.197 $p < 0.10$). The next specification uses an alternative measure of perceived strategic innovativeness. As mentioned above, the uniqueness of products or services is present if the firm has no (or very few) competitors offering the same product or service to their current or potential customers. The results are

2008								
Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.539	0.7263	1.00						
1.386	0.6001	0.143***	1.00					
1.592	0.9178	0.055**	0.145***	1.00				
0.503	0.2188	0.076**	0.116***	0.029	1.00			
1.065	0.9215	0.066**	0.092**	–0.015	–0.027	1.00		
2.497	0.6763	–0.043	–0.064**	–0.064**	–0.043*	0.033	1.00	
2.861	1.072	0.036	–0.042	–0.020	–0.025	–0.063*	–0.048*	1.00

in accordance with those expected, that is, a small firm seemingly without competitors offering the same product or service as compared to another selling non distinctive or standardized products (omitted category) significantly increases its likelihood of being more intensively export-oriented (*product's distinctiveness* 2007: 1.309 $p < 0.05$, and 2008: 1.283 $p < 0.05$).

As mentioned earlier, an analysis using OLM incorporates an ordinal nature of the dependent variable and generally showed a positive relationship between innovativeness (either in terms of product/service and process) and a firm's export propensity, as well as increasing its export intensity. Hence, Hypotheses H1a and H1b receive support.

Export Propensity and Innovativeness

In order to explore whether export propensity can help explain company innovativeness, we need to deploy a procedure that can estimate the probability of the expected event (i.e., innovativeness). Given that we have binary-dependent variables, logistic regression is more appropriate. Logistic regression is a statistical analysis aimed at predicting and exploring a binary categorical variable (Andersson et al., 2004). Logistic regression differs from multiple regression analysis in that it directly predicts the probability of an event occurring (Hair et al., 1998), and hence enables us to identify whether export propensity is relevant in categorizing firms as innovative or not. Table 7.5 displays the results of the logistic regression.

The chi-square test of both the *product/service innovativeness* and *process innovativeness* complete models was significant and indicates that a significant relationship exists between the entire set of independent variables and dependent variables. Table 7.5 displays the odds ratio, the significance at the corresponding level, and the standard deviation. The predicted values of dependent variables concern the 'log odds' that an event will occur, and

Table 7.3 Summary statistics and correlation for key variables: logit regression 2007 and 2008

Variables	2007								2008							
	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)
(1) i.prod/serv.	0.4073	0.4915	1.00						0.4002	0.4901	1.00					
(2) proc.innov.	0.3408	0.4742	0.137**	1.00					0.3250	0.4685	0.112**	1.00				
(3) exp.prop.	0.4002	0.4901	0.134**	0.113	1.00				0.3754	0.4844	0.105**	0.058**	1.00			
(4) employeesln	1.098	0.9797	0.070*	0.048	0.075**	1.00			1.065	0.9215	0.070*	–0.008	0.044*	1.00		
(5) ageln	2.482	0.6637	–0.072*	–0.046	–0.055*	–0.008	1.00		2.497	0.6763	–0.075**	–0.081**	–0.059**	0.033	1.00	
(6) industry	2.878	1.043	0.074*	0.017	0.052*	–0.010	–0075*	1.00	2.861	1.072	0.034	–0.031	0.049*	–0.063**	–0.048*	1.00

Note: $^{*}p < 0.05$; $^{**}p < 0.01$. $^{\ln}$ logarithmic form.

Table 7.4 Ordinal logistic regression to export intensity: a cross-sectional analysis for the years 2007 and 2008

		2007				2008			
		Model 1		Model 2		Model 1		Model 2	
Rating									
= 1		0.551	(0.345)	0.945	(0.356)	0.179	(0.267)	0.556	(0.280)
= 2		1.897	(0.352)	2.325	(0.364)	1.542	(0.271)	1.941	(0.285)
= 3		2.521	(0.359)	2.957	(0.371)	2.088	(0.276)	2.495	(0.291)
Control									
Size	Log_empl.	1.180**	(0.076)	1.175**	(0.076)	0.145**	(0.066)	1.135**	(0.066)
Age	Log_age	0.866	(0.083)	0.890	(0.085)	0.841**	(0.066)	0.874*	(0.070)
	Manufacturing	1.245	(0.318)	1.140	(0.294)	0.792	(0.148)	0.759	(0.143)
Industry	Service	1.145	(0.320)	1.045	(0.296)	0.950	(0.200)	0.911	(0.193)
	Consumer-oriented	1.710**	(0.427)	1.574*	(0.396)	1.090	(0.196)	1.054	(0.191)
	Extractive[o.c.]	o.c.		o.c.		o.c.		o.c.	
Hypothesis	*Innovativeness*								
	All			1.611***	(0.237)			1.660***	(0.263)
iProd/Serv.	Some			1.447**	(0.283)			1.512***	(0.114)
	No			o.c.				o.c.	
	Extremely new			1.451**	(0.220)			1.255*	(0.154)
Proc.innov.	New			1.591**	(0.325)			1.197*	(0.259)
	No new[o.c.]			o.c.				o.c.	
Uniqueness	Product's distinctiveness			1.309**	(0.182)			1.283**	(0.150)
								o.c.	
Model fit									
	N	977		977		1449		1449	
	Chi^2 (df)	18.01(5)		47.46 (10)		15.55 (5)		45.49 (10)	
	Prob > Chi^2	0.0029		0.0000		0.0082		0.0000	
	Pseudo R^2 (Nagelkerke)	0.0089		0.0233		0.0054		0.0158	

Note: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. The numbers in brackets are standard errors. o.c. omitted category and the parameter is zero because it is redundant.

Table 7.5 Logit regression to innovativeness: a cross-sectional analysis for the years 2007 and 2008

Control		2007				2008			
		i.prod/serv		*Proc.innov.*		*i.prod/serv*		*Proc.innov.*	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Size	*Log_empl.*	1.147**	1.128*	1.102	1.084	1.173**	1.162**	0.976	.969
		(0.076)	(0.076)	(0.075)	(0.074)	(0.068)	(0.068)	(0.060)	(0.059)
Age	*Log_age*	0.824*	0.838*	0.874	0.889	0.800**	0.813**	0.767**	0.775**
		(0.082)	(0.084)	(0.090)	(0.092)	(0.64)	(0.066)	(0.064)	(0.065)
Industry	*Manufacturing*	1.788**	1.755**	1.284	1.256	1.533**	1.583**	1.163	1.182
		(0.480)	(0.474)	(0.339)	(0.333)	(0.305)	(0.317)	(0.230)	(0.235)
	Service	2.195**	2.175**	1.417	1.396	1.678**	1.699**	0.931	0.934
		(0.637)	(0.635)	(0.407)	(0.403)	(0.374)	(0.381)	(0.211)	(0.212)
	Consumer-oriented	2.036**	1.908**	1.257	1.177	1.519**	1.516**	0.920	0.915
		(0.538)	(0.509)	(0.327)	(0.309)	(0.296)	(0.297)	(0.179)	(0.179)
	Extractive o.c.	o.c.	o.c.	o.c.	o.c.	o.c.	o.c.	o.c.	o.c.
Hypothesis	*Export propensity*		1.675***		1.596***		1.525***		1.288**
			(0.226)		(0.221)		(0.170)		(0.149)
Model fit									
	N	977	977	977	977	1449	1449	1449	1449
	LR Chi^2 (df)	18.98(5)	33.60(6)	5.88(5)	17.25(6)	22.33(5)	36.63(6)	13.30(5)	18.06(6)
	Prob > Chi^2	0.0019	0.0000	0.3185	0.0084	0.0005	0.0000	0.0208	0.0061
	Pseudo R^2	0.0144	0.0254	0.0047	0.0138	0.0114	0.0188	0.0073	0.0099
	Correctly classified	59.06%	59.37%	65.92%	65.92%	60.04%	61.35%	67.43%	67.49%

Note: *$p < 0.10$; * $p < 0.05$; ***$p < 0.01$. The numbers in brackets are standard errors. o.c. omitted category and the parameter is zero because it is redundant.

the interpretation is thus analogous to that of linear regression (Hair et al., 1998). A positive coefficient implies that an increase in those variables represents a higher likelihood of innovativeness.

The results for the control variables are as expected. Size clearly plays an important role in increasing a firm's product or service innovativeness. We found that larger firms tend to be more innovative in product or service; however, there is no statistical difference concerning the process innovativeness. With respect to age, by observing the odds ratio (smaller than one) this finding might be considered as a negative coefficient. Thus, age seems to have an inverse relationship with innovativeness. In regard to the industrial sector, unsurprisingly firms in an extractive industry (omitted category) tend to be less innovative than firms in other industries. Furthermore, these differences between industries are more evident in products or service innovativeness than in process innovativeness.

Concerning H2, we assessed if the change in the independent binary variable (i.e., export propensity yes/no) increased the likelihood of achieving product or service innovativeness and process innovativeness (dependent variables). The results in Table 7.5 report that export propensity has a positive and significant effect on a firm's innovativeness propensity. In both cases, product/service innovativeness and process innovativeness, the probability that the event will occur is higher in exporters than in non-exporters. Moreover, our results confirm that export propensity has high explanatory power in both consecutive years, 2007 and 2008 (findings 2007: export propensity = 1.675 $p < 0.01$ for product/service innovativeness and export propensity = 1.596 $p < 0.01$ for process innovativeness; findings 2008: export propensity 1.525 $p < 0.01$ for product/service innovativeness and export propensity = 1.288 $p < 0.05$ for process innovativeness). Therefore, Hypothesis H2 is also supported.

DISCUSSION AND CONCLUSIONS

The purpose of this research was to investigate the role of innovativeness on firm export behavior (propensity and intensity) as well as a reverse effect of export propensity on innovation activities. Particular emphasis has been placed on innovativeness in product or service, process innovativeness, uniqueness of products or services and foreign sales. Consistent with calls to examine not only the antecedents of export activity but also its consequences (Salomon and Shaver, 2005), our study shows that, by examining the mutual role of one upon the other, there are simultaneous effects between innovativeness and export behavior.

Overall, our results seem to suggest that there is a double causality chain

between innovativeness and exports in both 2007 and 2008, through cross-sectional analyses conducted in these two consecutive years. Our findings provide evidence from two years' analysis, which may indicate a tendency that innovativeness, on the one hand, and exports, on the other hand, may influence each other. We also provide conceptual clarity on the difference between innovation and innovativeness by focusing on the definition of innovativeness which is rarely discussed.

By considering the relationship between innovativeness and export activity, our research has found a positive influence of all proposed variables on export intensity. The capacity of a business to cultivate and appropriate culture required to develop innovative and unique products relative to its competitors is vital for achieving and maintaining foreign sales. This implies that innovativeness could change the behavior of small firms; that is, when small businesses are committed to innovativeness, this significantly increases the likelihood of selling to foreign markets, and especially the level of their foreign sales ratio. In this vein, our findings support the view held by Wakelin (1998), who found considerable differences in the reaction of innovating and non-innovating companies, stressing that they behave differently in terms of export. Indeed, across our analysis, we confirmed the importance of small firms selling products and services that are either totally new or quite different from other existing products or services. Thus, we can state that the uniqueness of products and services is another important basis for internationalization.

The innovativeness culture can generate competitive advantages through product or service innovativeness, process innovativeness and the uniqueness of products and services. It provides firms with the possibility of initiating and/or increasing exports and becoming more entrepreneurial-oriented in different markets. Therefore, in line with other researchers (e.g. Denicolai et al., 2014; Filipescu et al., 2013; López Rodríguez and García Rodríguez, 2005;), it can be stated that innovativeness matters for export behavior. Furthermore, from the perspective of the resource-based view, innovativeness represents an original combination of the organization's resources and is developed over the lifetime of the firm (Monreal-Pérez et al., 2012).

Moreover, our empirical results provide support for the direction of a number of recent arguments. For instance, Cassiman and Golovko (2011) argued that product innovativeness has an important moderating effect on the positive association between exports and productivity. Also, analyzing German manufacturers, Kirbach and Schmiedeberg (2008) found a strong impact of product innovativeness on the decision to export, and they suggested that innovating firms are more likely to export and tend to realize a larger share of revenue from the international market.

In turn, the learning-by-exporting hypothesis predicts that organizational innovativeness will increase if the company has export activities and may learn from them accordingly. Our findings corroborate this argument. The positive association between export propensity and a firm's innovativeness observed in the second part of the empirical analysis confirms that firms do increase product/service and process (technology) innovativeness if they are export oriented. This observed superior innovativeness may be related to the firm's ability to get new knowledge in its exports markets, namely, exporting firms tend to increase their innovativeness by absorbing knowledge and ideas from several sources and/or countries (absorptive capacity). Thus, our findings might be consistent with the existence of learning-by-exporting as emphasized in recent literature (Kafouros et al., 2008; Salomon and Jin, 2008; Salomon and Shaver, 2005).

However, we must interpret the results on this learning-by-exporting effect with caution because some previous studies on this issue have found limited evidence and suggested that firms should export to a large number of markets in order to achieve advantages from the potential learning generated by their export activity (Fariñas and Martín-Marcos, 2007; Monreal-Pérez et al., 2012). Nonetheless, when companies not only learn about foreign markets but also use their resources and capabilities to solve potential problems abroad, they can succeed in reaching the learning-by-export effect. In this sense, some abilities such as managerial foreign languages skills and international business knowledge are crucial for improving the course of actions followed by a company abroad (Stoian et al., 2011).

In addition, by observing two consecutive years, the findings may indicate a tendency about the relationships proposed in the study. Hence, we can state that our study contributes to the literature and also presents some implications for research and practice.

For academics, this study adds to the stream of research that explains the antecedents of the decision to export and in which degree. We take a different perspective, providing evidence from each innovativeness dimension, namely considering the influence of innovativeness and uniqueness in product and/or service as well as in process/technology. In summary, the firm's ability to innovate in product or service in a certain degree – the more, the better – constitutes an essential driver to face international challenges, and associated with technological innovativeness impels small firms to operate abroad by exporting with even more intensity. Equally as important, the level of uniqueness concerning the product–market relationship should be interpreted as further evidence of the relevance of firm innovativeness at the moment of entering and expanding the firm's international market share because the fewer the number of other

businesses offering the same product or service to customers, the more innovative the firm's outputs are. Moreover, we contribute to research in another particular dimension (i.e., the effect of export propensity on a firm's innovativeness). Hence, the theoretical contributions of this study lie in the extension of innovativeness research with an emphasis on export propensity and intensity.

Our findings also contribute to the literature by offering further evidence on the controversial relationship between innovativeness and internationalization. In particular, our study contributes to a better understanding of the SME internationalization–innovativeness relationship, as well as to theoretical literature on resource capabilities and learning-by-exporting. The theoretical contribution shows that innovativeness, seen as an essential firm capability, might have a positive influence on the probability and intensity of participation in export markets. Equally important, our study contributes to the extant literature by investigating the learning effect associated with export behavior on the likelihood of innovation commitment in small firms. Finally, unlike most studies that limit their focus to innovative and high-technology firms and often only consider innovation in products and/or technology available but not both at the same time, our study is based on evidence from small firms in different types of industries (both high- and low-tech). We also adopt the construct of innovativeness which gives a more complete reflection and embraces a wider range of innovations adopted in a given time period. This helps us provide clarity on the difference between innovation and innovativeness as mentioned above.

For business managers, it is important to know that firms aiming at innovating in products or services and/or technological resources will have a superior capacity to gain access to international markets as well as to increase their sales abroad. Our results suggest that exporting is more than just a decision to increase sales and reach other markets. Knowledge and learning obtained by means of gaining experience in foreign markets may also help firms increase their capacity to innovate. Thus, if globalization pushes companies to enter foreign markets and acquire specific knowledge in order to implement technology and business innovation (Podmetina et al., 2009), the ability of a firm to assimilate, learn and apply their export-related experience to commercial ends is critical to developing their innovative capabilities.

There are several other possibilities for future research in line with our results. The main issue is the need to understand the causal relationship between innovativeness and export behavior/activities. We observed that there seem to be mutual effects between them. Nonetheless, this chapter is subject to several limitations and we suggest caution in interpreting

its findings. First, export behavior may be affected by many factors that cannot be easily controlled (Monreal-Pérez et al., 2012). Second, our sample consists only of business owner-managers surveyed by the GEM research programme. Despite the fact that self-reported data from the owner-managers of small firms were highly correlated with accounting information, supporting the accuracy and reliability of the data (Chandler and Hanks, 1993), future research utilizing other more objective measures on export performance will be welcome. Third, the cross-sectional design of the study cannot guarantee the direction of causality among variables. Future research could examine, using refined panel data, whether a firm's innovativeness enhances its probability of exporting or even increases its sales abroad across time (e.g., Cassiman and Golovko, 2011; Filipescu et al., 2013; Monreal-Pérez et al., 2012;). Moreover, it is acknowledged that firms learn more when they exert significant effort in processing new external knowledge (Sapienza et al., 2005). In this sense, future studies should include a longitudinal perspective observing the effects of learning-by-exporting on a firm's innovativeness (e.g. Damijan et al., 2010; Salomon and Shaver, 2005). Furthermore, time-series analysis and some exploratory qualitative research could provide more insight on the direction of causality between innovativeness and export activities and could be another interesting avenue for future work in order to clarify such relationships.

Finally, regarding the models being used in this study, we controlled the main potential variables that may have influence on export, such as a firm's size, firm's age and industry. However, another potential limitation of this study is that we have not considered the possible foreign ownership of the firms which, as stressed in previous studies, can make entry abroad easier (Basile, 2001), and share of foreign capital can moderate the effects of innovativeness dimensions on overall firm performance (Alpay et al., 2012).

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