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Regional FDI, technological knowledge and Export-Oriented Entrepreneurs in Spain

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Regional FDI, technological knowledge and Export-Oriented Entrepreneurs in Spain

Introduction

Despite the importance of the environment to new venture internationalization (Coviello, 2006; Johanson & Vahlne, 2003; Moen, 2002), most empirical studies fail to include environmental variables in the analysis of the determinants of international entrepreneurship (De Clercq, Hessels, & van Stel, 2008). As a result, little is known about the role of the environment on the early internationalization of new ventures (Oviatt & McDougall, 2005; Zahra & George, 2002).

The present study is aimed at contributing to the extant literature on international entrepreneurship by analyzing how the regional environment influences the export-oriented behaviour of early-stage entrepreneurs. In particular, we suggest that, apart from some individual and firm-specific level factors, two regional conditions are particularly likely to affect the ability of early-stage entrepreneurs to exploit opportunities internationally.¹ The first one is the exposure to foreign organizations and other domestic organizations that carry out international activities, as measured by the intensity of inward and outward Foreign Direct Investment (FDI) flows in the same region, which can have an influence on entrepreneurs' export-oriented behaviour through the lens of neo-institutional theory (DiMaggio & Powell, 1983). The second one is the availability of external knowledge, as measured by the accumulated stock of technological knowledge in the same region, which can be considered a critical external resource according to resource dependence theory (Pfeffer & Salancik, 2003), and from which the entrepreneur can benefit to reach foreign markets.

Since early-stage entrepreneurs and their new ventures usually face high levels of uncertainty (Stinchcombe, 1965), they are likely to do what they observe in order to justify their behaviour; and as a result, they may become isomorphic with other organizations in the same environment according to neo-institutional theorists (DiMaggio & Powell, 1983). Following this logic, the exposure to inward or outward FDI in the geographical environment within which the entrepreneur is embedded will positively affect his/her propensity to engage in international activities such as exporting. De Clecq, Hessels & van Stel (2008) provide evidence in favour of this argument by showing that the percentage of export-oriented entrepreneurial activity is positively related to the level of inward and outward FDI at country level in

¹ In this way we follow Low & MacMillan (1988), who suggest that the entrepreneurial phenomenon (i.e., entrepreneurial entry and the subsequent actions and growth) cannot be understood without considering variables at different levels of analysis.

developed economies. However, their findings cannot be applied at individual or firm level since it would imply a bias of ecological fallacy, and therefore the impact of FDI on the export-orientation of new ventures deserves further research.

On the other hand, early-stage entrepreneurs often rely on external resources due to the typically small size of their new ventures (Aldrich & Auster, 1986). The existence of spillovers allows early-stage entrepreneurs to access the knowledge generated by third-party organizations sharing the same environment, and such external resource may enable them to build superior competitive advantages with which to compete or operate in foreign markets. The extent to which a region generates new knowledge helps to increase the stock of available knowledge and the capacity of the entrepreneurs and new ventures embedded in such regional environment to export. Although knowledge has been recognized as a foreign location advantage for new ventures (Oviatt & McDougall, 1994), the emphasis given in the international entrepreneurship literature is on knowledge possessed by the firm. Few empirical studies focus on the impact that knowledge from external sources has on new venture internationalization (Fernhaber, McDougall-Covin, & Shepherd, 2009), and this leaves room for further research on this issue.

The goal of the present study is to determine how regional differences in FDI and accumulated knowledge affect the export-oriented behaviour of early-stage entrepreneurs. In this way, our research raises the question: (how) does the exposure to environments with high levels of FDI and accumulated knowledge affect the export-oriented behaviour of early-stage entrepreneurs?

We shed light on this issue by analyzing the propensity of Spanish early-stage entrepreneurs to engage in export-oriented activities over the period 2005-2009. Data on individual and firm-specific factors come from the Global Entrepreneurship Monitor (GEM) project and data on regional levels of FDI flows and accumulated knowledge come from other secondary sources. The sample is made up of 5,794 early-stage entrepreneurs whose businesses have been operated for no more than 42 months.

The results from a multilevel analysis show that the increase of regional inward FDI significantly raises the probability of an early-stage entrepreneur to be involved in export-oriented businesses, while the increase of regional outward FDI or accumulated knowledge seems to have no impact. The results also show that exporting is driven by individual and firm-specific factors that have been analyzed in previous studies.

Following this introductory section, we develop the theory and hypotheses of this study. The third section describes the methods and data used to test our hypotheses. Results are presented and discussed in the

fourth section. Finally, conclusions and implications derived from the results are summarised in the fifth section.

Theoretical background

The environment may facilitate or constrain organizational behaviours (Bouchikhi, 1993), since it provides firms with the means needed for growth and competition (Wan & Hoskisson, 2003). Moreover, it is suggested that firms in general are a reflection of the environment in which they are embedded (Meyer & Rowan, 1991; Whitley, 1999). Similarly to other economic actors, early-stage entrepreneurs are influenced by their environmental context (Autio & Acs, 2010; Edelman & Yli-Renko, 2010; McDougall, Covin, Robinson, & Herron, 1994; Sarkar, Echambadi, Agarwal, & Sen, 2006; Sine & David, 2003; Woolley & Rottner, 2008). The impact of the environment on entrepreneurs is particularly important because their young - usually small - organizations lack legitimacy due to fact that they are new (Stinchcombe, 1965) and possess limited resources (Aldrich & Auster, 1986). Consequently, they have little control over external conditions (Pfeffer & Salancik, 2003), which makes them more dependent on the environment than established organizations (Gnyawali & Fogel, 1994).

The environment includes the set of institutions and resources that shape the actions of organizations and individuals operating within it (Wan & Hoskisson, 2003). Institutions refer to all rules, conventions and beliefs representing a social reality, which can be taken for granted, supported by public opinion or imposed by law (DiMaggio & Powell, 1983; Meyer & Rowan, 1991). Resources refer to the pool of assets, factors and inputs needed by firms to produce goods and services, as well as to survive and grow, and they can be naturally-endowed (e.g., land and other natural resources), technically-advanced (e.g., infrastructures and financial capital), or knowledge-based (e.g., human capital and technologies) (Wan & Hoskisson, 2003).

Evidence shows that entrepreneurs' behaviour, decisions and performance are conditioned by institutionalized aspects and critical resources available in the environment (Autio & Acs, 2010; Sarkar, et al., 2006). However, as Castrogiovanni (1991) argues, the environment can be "everything else" external to the firm; and given that "[i]t is impossible to examine everything" (p. 543), he suggests choosing specific environmental elements that are relevant to the particular phenomenon under analysis. Accordingly, rather than exhaustively examining the environment, we focus on certain specific institutions and resources that are relevant for export-oriented entrepreneurs. In particular, we argue that the level of exposure to (foreign and domestic) firms engaged in international activities generates institutions that induce early-stage entrepreneurs to enter foreign markets, whereas the level of technological knowledge

available in the environment constitutes a critical external resource that facilitates such export-oriented behaviour.

FDI exposure and entrepreneurs' export-oriented behaviour

It is commonly believed that the primary benefits from FDI in host environments are the productivity gains derived from the better knowledge, skills, or technologies that spill over from foreign firms to local ones through different channels (Blomström & Kokko, 1998; Caves, 2007; Görg & Greenaway, 2004).² However, in addition to productivity spillovers, foreign firms or MNEs conducting FDI activities in a given environment can also have an impact on the behaviour of local firms through the lens of neo-institutional theory, since the former act as role models with specific traits which are likely to be imitated by the latter in order to enhance legitimacy and reduce the uncertainty associated with changes in that environment (Cyert & March, 1963; DiMaggio & Powell, 1983). In particular, as foreign firms usually exploit their unique assets to export from the host environments in which they are established (Görg & Greenaway, 2004), we argue that early-stage entrepreneurs and their new ventures can learn how to penetrate export markets by mimicking foreign firms they observe (through inward FDI activities) in the same location.

The role mimetic isomorphism may induce early-stage entrepreneurs to consciously expand their businesses towards international markets when they are exposed to other firms which create competitive pressures (Gaba, Pan, & Ungson, 2002) or serve as role models (Fernhaber & Li, 2010; Lu, 2002) by carrying out international activities in the same environment. In this way, foreign firms represent a source of mimetic isomorphism for entrepreneurs and their new ventures. Of course, foreign firms must adapt to the institutionalized rules of host environments; however, they may introduce new practices that potentially change existing institutionalized structures, and these changes are likely to encourage or force local organizations to adopt a favourable behaviour towards foreign markets, especially new ventures which, due to their little experience, tend to do what they observe to achieve social legitimacy. Consistent with this view, the presence of foreign firms in the same location results in more local firms engaged in international expansion (Aitken, Hanson, & Harrison, 1997; Barrios, Görg, & Strobl, 2003; Greenaway, Sousa, & Wakelin, 2004), including new ventures created as a result of entrepreneurial activity (De Clercq, et al., 2008). This relationship can be seen as a mimetic reaction by which local firms seek to mitigate uncertainty and gain legitimacy (Guillen, 2002; Henisz & Delios, 2001).

² Behind this idea is the assumption that foreign firms possess superior knowledge-based assets (e.g. management and marketing know-how, breaking technologies, or efficient production systems) the returns of which is difficult to be fully appropriated by them (Kogut & Zander, 1993; Liu, 2008)

The imitation of foreign firms by new ventures is reinforced by certain spillovers derived from FDI activities that foster the mimetic process. First, due to a demand-pulling effect, new ventures may become suppliers of intermediate goods or sub-contractors for foreign firms located in the same environment (Barbosa & Eiriz, 2009). Such commercial linkages between foreign firms and local new ventures allows the latter to have a close observation of the international activities carried out by the former, as well as to reduce uncertainty through the access to the knowledge needed for a successful international expansion (Aitken, et al., 1997; Blomström & Kokko, 1998; De Clercq, et al., 2008; Görg & Greenaway, 2004).

Second, exporting involves fixed cost in order to physically reach overseas markets (Blomström & Kokko, 1998; Görg & Greenaway, 2004), and foreign firms can reduce such entry costs for all new ventures (i.e., without any type of linkage requirement) either through the enhancement of transport infrastructures (De Clercq, et al., 2008), the creation of new distribution channels (Görg & Greenaway, 2004), or the reduction of trade barriers by means of lobbying power (Blomström & Kokko, 1998).

Third, in order to use their competitive advantages, foreign firms require skilled employees which are generally got by investing in training of local labour force (Fosfuri, Motta, & Rønde, 2001). However, foreign firms cannot completely lock in their skilled employees, and as a result the effects of such training investments can be spread among local firms (Gershenberg, 1987). New ventures can hire former employees in foreign firms or MNEs, and use the knowledge and experience they gained while working for foreign firms to export. These training effects may also arise if former employees in foreign firms, which will probably have an international orientation, decide to start a new venture (De Clercq, et al., 2008).

All these FDI spillover effects can take place alone or simultaneously. In any case, they are likely to facilitate the imitation of foreign firms' export activities by new ventures. The more foreign firms in the environment, the more chances have early-stage entrepreneurs and their new ventures to observe and imitate foreign firms' export activities. Here the environment that is relevant to the entrepreneur is analysed at regional. Thus, we propose the following hypothesis:³

Hypothesis 1: Early-stage entrepreneurs located in **regions** with a higher exposure to inward FDI flows are more likely to be export-oriented.

Imitation effects leading to international expansion of new ventures are not limited to the exposure to inward FDI or foreign firms located in the location. A new venture can also imitate the international

³ Indeed, reviews of the empirical literature suggest that spillovers from inward FDI can operate between industries within a region and within an industry across regions (Blomström & Kokko, 1998; Caves, 2007).

activities of other domestic organizations sharing its environment (Blomström & Kokko, 1998). For instance, Henisz & Delios (2001) demonstrate that, when firms face uncertainty as a result of the lack of experience, foreign entry decisions are influenced by prior international activities of other domestic firms from the immediate environment, which provide information and legitimacy for entering export markets through a mimetic behaviour. Other studies also show evidence that a firm is more likely to be exporter in environments where other domestic firms perform international activities (Barrios, et al., 2003; Guillen, 2002; Martin, Swaminathan, & Mitchell, 1998). Thus, inward FDI flows can also have a positive impact on early stage entrepreneurs' decisions to export.

Actually, domestic firms engaged in overseas investments or domestic MNEs produce similar spillover effects as foreign MNEs (Blomström & Kokko, 1998), and such spillovers may as well ease the imitation of an export-oriented behaviour by local new ventures (De Clercq, et al., 2008). Apart from the effects that parallel inward FDI spillovers, the establishment of domestic firms in foreign countries may familiarize foreign customers with the range of products and services offered by other firms in the home environment. That is, overseas investments in production plants, distribution channels, or other international activities carried out by a domestic firm are likely to publicize its home environment in the foreign markets where it is established, which in turn increases the reputation of local new ventures from that home environment in those foreign markets (Blomström & Kokko, 1998). For instance, Japanese, German or Swedish products are viewed as high quality products regardless of whether the manufacturer is a new firm or not, because MNEs from these countries have a long tradition of international presence. Furthermore, even some regions in these countries are well-known worldwide due to their MNEs. Just to give an example, Bavaria and Baden-Württemberg in Germany are recognized because of their automotive industry firms (e.g., BMW, Porsche or Mercedes), while Stockholm region in Sweden is recognized because of its design industry firms (e.g., IKEA's design offices).

For all aforementioned reasons, we expect that outward FDI activities will also positively influence the adoption of an export-oriented behaviour by early-stage entrepreneurs and their new ventures. Thus, we propose the following hypothesis:

Hypothesis 2: Early-stage entrepreneurs located in **regions** with a higher exposure to outward FDI flows are more likely to be export-oriented.

External knowledge and entrepreneurs' export-oriented behaviour

The actions taken by both existing and new organizations operating in a given environment are influenced by the availability of resources within that environment (Aldrich, 1979; Castrogiovanni, 1991; Dess & Beard, 1984; Pfeffer & Salancik, 2003; Randolph & Dess, 1984; Staw & Sz wajkowski, 1975). The

abundance of resources in the environment allows early-stage entrepreneurs to gain access to the means they need to start and expand their new ventures (Gnyawali & Fogel, 1994). Nonetheless, among the different kinds of resources available in the environment, external knowledge is a markedly important driver for starting, surviving and growing a business (Acs, Braunerhjelm, Audretsch, & Carlsson, 2009; Agarwal, Audretsch, & Sarkar, 2007; Sarkar, et al., 2006). Above all, knowledge, be it internal or external, is a critical resource for individuals and organizations to discover or create new opportunities that can be subsequently exploited (Shane & Venkataraman, 2000). For that reason, while management theories has long viewed external knowledge as a source of innovation and competitive advantage (Cohen & Levinthal, 1990), the literature on entrepreneurship considers external knowledge as the fundamental source of entrepreneurial opportunities for knowledge-generating organizations as well as for third-party organizations and individuals (Acs, et al., 2009; Venkataraman, 1997).

Apart from the individual knowledge, an entrepreneur can access the knowledge available in the environment to formulate strategies and take decisions with regard to a business opportunity because, due to the existence of spillover effects, knowledge is a resource that usually becomes disseminated across different economic actors sharing the same environment (Audretsch, 1998), specially geographically close environments (Audretsch & Feldman, 1996). According to this line of thinking, evidence shows that smaller firms, as those typically started up by entrepreneurs, rely on external sources of knowledge to introduce innovations in the market, suggesting that such external resource may spill over from existing firms conducting R&D activities or universities and other research institutions (Acs, Audretsch, & Feldman, 1994). This means that, even if an economic actor does not have control over external resources (Pfeffer & Salancik, 2003), as it may be the case with entrepreneurs and their new ventures, he/she can capitalize on a munificent environment in terms of knowledge. Thus, entrepreneurs may be able to profit from the external knowledge generated by third-party organizations without having to pay for it in a formal market.

Knowledge plays an important role for internationalization because it can generate differentiation or cost advantages for both traditional MNEs (Kogut & Zander, 1993) and new ventures engaged in international activities (Oviatt & McDougall, 1994). For instance, knowledge allows creating innovative products and services that can be commercialized beyond national borders, providing organizations with competitive advantages for achieving success in foreign markets even early in the business life cycle (Bloodgood, Sapienza, & Almeida, 1996). Not surprisingly, the existence of international new ventures was first identified in knowledge-intensive industries (Jolly, Alahuhta, & Jeannet, 1992; Knight & Cavusgil, 2004; Oviatt, McDougall, Simon, & Shrader, 1993). In environments with knowledge munificence, new ventures are not only able to outperform purely domestic firms but also to challenge incumbents in

international markets because they may benefit from certain advantages derived from the superior access to knowledge spillovers (Gilbert, McDougall, & Audretsch, 2008).

For organizations sharing the same environment, the availability of external knowledge can also represent a source of competitive advantage to outperform organizations in other environments (Porter, 1990), and thereby to develop business activities across borders. In this way, entrepreneurs in highly knowledge-endowed environments are likely to be more oriented towards foreign markets because the high availability of external knowledge may enhance their ability to identify internationally exploitable opportunities, and the capacity of their new ventures to develop world-class technologies. In contrast, entrepreneurs in environments with low levels of knowledge are less likely to be involved in international activities because in those environments their new ventures lack globally sustainable competitive advantages and capabilities for successfully operating in foreign markets, and they may at best develop local competitive advantages that dissipate in foreign markets.

Similar to the impact of FDI, the availability of knowledge in the environment here is analyzed at regional level. In particular, one can expect that the potential for new entrepreneurial opportunities across borders increases as the regional knowledge base is expanded. Therefore:

Hypothesis 3: Early-stage entrepreneurs located in **regions** with a higher stock of knowledge per firm are more likely to be export-oriented.

Methods and data

Database

We created a dataset including individual and firm-specific variables, as well as regional variables explaining the export-oriented behaviour of early-stage entrepreneurs. The main source we used for individual and firm-specific data was the Spanish Global Entrepreneurship Monitor (GEM) project. The GEM project is an international research program focused on entrepreneurship that annually conducts a standardized study in more than forty countries since the end of the nineties (see Reynolds et al., 2005 for more details). Spain joined the project in 1999 on the basis of a nationally representative sample. However, the representativeness of the sample has been expanded to a regional level since 2003, and nowadays all Spanish regions are covered with own representative samples of adult population (18-64 years old). We obtained Spanish GEM data at individual and firm-specific level from years 2005 to 2009, and gathered it in a merged dataset. This dataset was complemented with data on FDI flows and accumulated knowledge at regional (NUT-2 regions) level from the Secretary for Foreign Trade of the

Spanish Ministry of Industry, Tourism and Trade, and the Spanish Institute of Statistics (INE by its Spanish acronym), respectively.

The unit of analysis is the early-stage entrepreneur (nascent and new entrepreneur), which refers to an individual that either is involved in starting a new venture or is the owner/manager of a business that is less than 42 months old (Reynolds, et al., 2005). In this way, we focus on phases near to the entrepreneur's firm inception in order to analyze the export-oriented behaviour as an early internationalization activity, similarly to previous studies (De Clercq, et al., 2008). Our sample consists of 5,794 early-stage entrepreneurs from all 17 autonomous communities of Spain. Thereby, our sample is representative of the Spanish population of entrepreneurs across regions.

Measurement of variables

Dependent variable

A dichotomous variable measures whether the early-stage entrepreneur has an export-oriented behaviour based on the propensity of his/her new venture to serve foreign customers (*Export*). If 1% or more of the customers of the entrepreneur's new venture are located abroad, this variable takes the value one (1); otherwise, it takes the value zero (0). Consistent with the view that the phenomenon of international entrepreneurship implies that the internationalization behaviour is embedded in the start-up process (Fletcher, 2004; Oviatt & McDougall, 1994), our measure of export-oriented behaviour corresponds to entrepreneurs who are currently involved in the start-up process of a new venture which sells goods or services to some foreign customers or entrepreneurs who have recently gone through this process.

Independent variables

Exposure to FDI

Two types of FDI activities can be distinguished in a given environment. While inward FDI refers to direct investments in productive assets of an economy made by foreign investors, outward FDI refers to direct investments in productive assets of a foreign country made by domestic investors. In both cases, the investment must imply a lasting interest for the investor in order to be considered as FDI. A lasting interest means a long-term strategic relation in which the investor has a significant degree of control over the management decisions of the acquired asset, which is usually evidenced when the investor has an ownership stake of at least 10% of the voting power over the acquired asset (OECD, 2008). We operationalized the exposure to FDI as the gross flow of inward (*Inward FDI*) or outward FDI (*Outward FDI*) in thousand Euros per firm in the region j in which the early-stage entrepreneur i operates. This measure refers only to new investments that take place in the form of equity participation, and it excludes the investments by foreign securities holding companies which operate in Spain for tax purposes. Given

that both inward and outward FDI flows are subject to a high level of stochastic disturbance, we use an average measure over five years (from 2005 to 2009). Data for this variable were obtained from the Secretary for Foreign Trade of the Spanish Ministry of Industry, Tourism and Trade.

Stock of technological knowledge

The stock of technological knowledge refers to the amount of knowledge resources generated and accumulated over time that is ready for commercial exploitation by economic actors. Based on the methodology proposed by Soete & Patel (1985), we construct this variable by averaging the past flows of R&D investment at regional level.⁴ The operationalized measure is the stock of technological knowledge (*R&D stock*) in thousand Euros per firm in the region j in which the early-stage entrepreneur i operates. Similarly to the measurement of FDI exposure, we use an average measure over five years (from 2005 to 2009). Data for the calculation of this variable come from the Statistics about R&D activities provided by the INE.

Control variables

Most studies on the determinants of international entrepreneurship take into account individual and firm-specific variables to explain early internationalization. We control for some of these variables which have been found to be important in the extant literature.

Individual control variables

As an entrepreneurial behaviour that involves more risk than merely starting a business, the export-oriented behaviour of an early-stage entrepreneur may be influenced by his/her demographic characteristics, human capital and perceptions.

Three demographic variables are added to the analysis as controls. First, we include a gender dummy to capture whether the early-stage entrepreneur is male or female (*Male*). As it has been suggested in the

⁴ Soete & Patel (1985) assume that R&D investments in a given year take an average period of 5 years to be completely incorporated in the stock of technological capital, in such a way that nothing is incorporated in the stock during the year in which the investment was made, 20% is incorporated in the first year following the investment, 30% is incorporated both in the second year and in the third year following the year of the investment, and the remaining 20% is incorporated in the fourth year following the investment. Apart from that, they also take into account the depreciation of the knowledge accumulated in previous years due to the obsolescence that takes place with the passage of time by assuming an annual depreciation rate of 15%. Accordingly, the stock of technological knowledge per firm is estimated as follows:

$$R\&Dstock/Firm_t = \frac{(1-0.15) R\&Dstock_{t-1} + 0.2 R\&D_{t-1} + 0.3 R\&D_{t-2} + 0.3 R\&D_{t-3} + 0.2 R\&D_{t-4}}{Firms_t}$$

where $R\&Dstock/Firm$ denotes the stock of technological knowledge per firm, $R\&D$ denotes the flows of R&D investment, and $Firm$ is the total number of existing firms in at the aggregate unit of analysis.

entrepreneurship literature, men and women involved in entrepreneurial activity usually have different business goals (Brush, 1992; Verheul, van Stel, & Thurik, 2006). Female entrepreneurs are particularly concerned with quality of life and the balance between economic and non economic goals, that is, they may choose not to grow in return for other goals. Accordingly, female entrepreneurs are expected to be less export-oriented than their male counterparts (Orser, Spence, Riding, & Carrington, 2010). Second, we also include a count variable for age in number of years (*Age*) to capture how old the early-stage entrepreneur is. While some authors argue that young entrepreneurs perform better than older ones (van Praag, 1996), probably due to their more favourable attitude towards change, growth and risk-taking decisions (Bantel & Jackson, 1989; Sapienza & Grimm, 1997), others authors assert that older entrepreneurs are likely to have a higher experience, a stronger financial situation and a wider network of social and business contacts that help them to be successful (Blackburn, Mackintosh, & North, 1998; Peña, 2002; Verheul & van Stel, 2007; Weber & Schaper, 2004), and expand their new ventures towards foreign markets (Westhead, Wright, & Ucbasaran, 2001). Indeed, the relationship between the age of the entrepreneur and the likelihood of being export-oriented may actually peak at a certain age threshold, and decrease afterwards. In this way, we also include the age squared (Age^2) to capture the potentially decreasing positive effect of the early-stage entrepreneur's age on his/her export orientation. Third, we also include a dummy variable that indicates whether the entrepreneur is immigrant or not in order to control for the ethnic background (*Immigrant*). The ethnic background may have an impact on the propensity of an entrepreneur to become exporter (Madsen & Servais, 1997; McDougall, Shane, & Oviatt, 1994). Immigrants may be more internationally oriented because they know the marketplace both in their host country and their country of origin, as well as because they usually have certain language proficiencies and access to networks of other immigrants around the world.

Since higher levels of human capital provide the ability to identify and exploit opportunities internationally (Brush, Edelman, & Manolova, 2002; Westhead, et al., 2001), we control for three variables related to the early-stage entrepreneur's human capital. First, the literature in economics suggests that education is a good proxy for human capital. Therefore, we control for the educational attainment by including a dummy variable that indicates whether the early-stage entrepreneur has a bachelor's degree or not (*Graduate experience*). Second, we include a dummy variable that indicates that the early-stage entrepreneur has recently had an entrepreneurial experience as measured by being involved in a firm closure during the last year (*Recent experience*). Such kind of experience adds to entrepreneurs' human capital by offering the opportunity to learn valuable knowledge, as well as to enhance the ability and potential for recognition of international business opportunities (Wright, Westhead, & Ucbasaran, 2007). Third, we also include a dummy variable that indicates whether or not in the last three years the early-stage entrepreneur has invested in a new venture started by someone else (*Investor experience*). Prior

experience as investor in other businesses provides entrepreneurs with an increased knowledge of - and access to - financial sources and networks of business contacts, which makes them able to go through risky activities (e.g., exporting) when they become entrepreneurs. As suggested by Westhead, et al. (2001), highly educated and experienced entrepreneurs are expected to be more export-oriented.

Finally, we control for three perceptual variables. Perceptions are attitudes and beliefs of individuals that represent subjective thoughts or the awareness of certain situations without having an objective evidence of what might be expected (Arenius & Minniti, 2005). As Arenius & Minniti (2005) found, perceptual variables influence the entrepreneurial behaviour of individuals. Within this group of variables, we first include a dummy to control whether the early-stage entrepreneur perceives or not that there are good business opportunities in the market in the very short term (*Opportunity alertness*). The perception of business opportunities implies alertness, which is one of the most important and distinctive characteristics of entrepreneurial behaviour (Kirzner, 1979). And alertness is essential for recognizing and exploiting internationally oriented opportunities (Kontinen & Ojala, 2011) because early alert entrepreneurs are expected to be able to link resources from different countries with international market needs (Oviatt & McDougall, 1994). Second, we include a dummy that indicates whether the early-stage entrepreneur perceives or not that he/she possesses the proper knowledge, skill and experience to be entrepreneur (*Entrepreneurial skills*). Given that entrepreneurial decision making is linked to intentions, confidence in one's skills and the ability to start a business is essential for entrepreneurial behaviour (Arenius & Minniti, 2005), and therefore such perception is expected to have a positive impact on the involvement in international activities. Third, we control for the risk taking behaviour of the early-stage entrepreneur by including a dummy that indicates whether he/she has no fear of failure (*No fear of failure*). A high perception of fear of failure is a constraint for entrepreneurial behaviour and growth, especially when growth is achieved through exporting since risk is an important component of the entry into foreign markets. To sum up, higher business opportunity perception and confidence in one's skills and abilities, along with lower perception of likelihood of failure, should increase the probability that an early-stage entrepreneur will be export-oriented.

Firm-specific control variables:

Apart from the demographic characteristics, human capital and perceptions of the early-stage entrepreneur, there are also firm-specific factors of the new venture that may be also important for early internationalization (Bloodgood, et al., 1996; Campbell, 1996; Dhanaraj & Beamish, 2003). Firm-specific factors refers to unique resources and capabilities that provide organizations with sustainable competitive advantage (Barney, 1991).

In the present study, we control for three firm-specific resources. We first include a count variable to capture the size in terms of employment (*Number of employees*) as a proxy of internal resources. This measure excludes the employment corresponding to entrepreneur founders, even if their allocation of time to the new venture represents full-time jobs. A positive effect of this variable on the export-oriented behaviour of the early-stage entrepreneur is expected (Ruzzier, Hisrich, & Antoncic, 2006; Westhead, et al., 2001). Second, we also include a count variable to control for the expected employment growth in five years (*Expected growth*) because a growth-seeking behaviour may be the reflection a proactive attitude towards early international expansion (Baum, Schwens, & Kabst, 2011). Third, we include a count variable to capture the size of the entrepreneurial team (*Number of founders*) as a proxy of the potential resources provided by entrepreneurs in terms of multidisciplinary experience, financial capacity and business contacts and networks. Both the ambition to growth and the dimension of the team are expected to have a positive impact on the export-oriented behaviour of early-stage entrepreneurs.

To conclude, as for the firm-specific capabilities we include two control variables more. On the one hand, a dummy variable indicates whether the good or service offered by the new venture is or not considered new by all customers (*New to all customers*) in order to capture for its degree of innovation capacity. The capability to create an innovative product or service is one of the factors explaining the success of international new ventures (Dhanaraj & Beamish, 2003; Moen, 2002; Oviatt & McDougall, 1994). On the other hand, we also take into account the use of recent technologies by including a dummy that indicates whether the technologies required to create the product or service offered by the new venture have been available for less than one year or not (*New technology base*). Technological capability allow early-stage entrepreneurs to serve the market very fast, as well as to improve the production process or the provision of services to meet the global demand using a small-scale operation that could be economically feasible. These variables strengthen the ability to reach foreign markets (Dhanaraj & Beamish, 2003), and therefore both of them are expected to have a positive effect on early export orientation.

Estimation model

Building on the extant literature, our model starts from the idea that there are differences in export-oriented behaviour among early-stage entrepreneurs that cannot be solely explained by individual and firm-specific factors. Therefore, we use a multilevel modelling approach to analyze the influence of certain environmental factors in addition to individual and firm-specific factors (Luke, 2004).

We have data consisting of early-stage entrepreneurs grouped into regions. Thus, we consider individual and firm-specific variables related to the entrepreneur and his/her entrepreneurial venture, respectively, to be measured and modelled at level-1; and environmental variables related to the regional context to be

measured and modelled at level-2. The form of this multilevel model can be seen in the following system of equations:

$$\text{Level-1: } \log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_{0j} + \beta_{1j} X_{ij} \quad (1)$$

$$\text{Level-2: } \beta_{0j} = \gamma_{00} + \gamma_{01} W_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

The level-1 part of the model is similar to a typical logit regression, where p_{ij} is the probability that the early-stage entrepreneur i in region j is involved in the start-up process of an export-oriented new venture or is the owner/manager of an export-oriented business that is less than 42 months old; β_{0j} is the intercept in region j ; X_{ij} is the vector of individual and firm-specific control variables measured at level-1; and β_{1j} is the effect of such variables.

The level-2 part of the model indicates that the level-1 intercept, β_{0j} , is a function of level-2 predictors, where γ_{00} is the mean value of the level-1 dependent variable once controlled for the effect of explanatory variables at level 2; W_j is the vector of environmental explanatory variables measured at level-2 that correspond to regions j ; γ_{01} is the effect of such variables; and u_{0j} is the random effect that capture the variability of the dependent variable across regions j . The level 2 part of the model also indicates that the effect of level-1 control variables, β_{1j} , is a constant measured by γ_{10} , which represents the mean effect of the level-1 control variables across regions i .⁵

Results

Descriptive results

Table 1 depicts the sample according to the descriptive statistics of the variables under analysis, whereas Table 2 provides the correlation matrix. More than a third of the early-stage entrepreneurs included in the sample are export-oriented (36%). Male entrepreneurs represent 59% of the sample. The mean age of overall entrepreneurs is 39.61 years, and 10% of them are immigrants. Entrepreneurs with graduate experience, recent entrepreneurial experience or investor experience represent 34%, 4% and 8% of the sample, respectively. Besides, 38% of the sample is made up of alert entrepreneurs who perceive business opportunities in the short term, 92% corresponds to entrepreneurs who perceive that they have the skills

⁵ A preliminary empirical analysis of the data indicates no heterogeneity of slopes among level-2 units (i.e., regions). Therefore, variance components were estimated for intercepts only.

and knowledge required to be entrepreneur, and 31% corresponds to those who perceive that the fear of failure would not prevent them from being entrepreneur. On average, the size of the early-stage entrepreneur's new venture is two employees, with an expected growth in five years of 3.2 employees. In addition, the size of the entrepreneurial team is 1.83 founder members. As for the environmental conditions, the regions in which early-stage entrepreneurs are located show an average inward FDI activity of 3.47 thousand Euros per firm, and an average outward FDI activity of 13.69 thousand Euros per firm. Apart from that, the regional stock of technological knowledge reaches an average amount of 11.33 thousand Euros per firm. Given that these regional variables show a distribution with a long right tail, we applied a natural log transformation to these variables in order to smooth their skewed distribution and include them in the regression analysis below.

[Insert Table 1 about here]

The correlation matrix reveals that inward FDI and the outward FDI at regional level are somewhat correlated. To check whether multi-collinearity raises a problem, we computed the Variance Inflation Factor (VIF) scores for all variables included in the study. None of the VIFs scores exceeded 2.0 providing evidence of no multi-collinearity among predictor variables (Bowerman & O'Connell, 1990). In any case, we calculated two new variables to capture the total FDI, including inward and outward flows (*Total FDI*), and the percentage of inward (*% of inward FDI*), so that both types of flows can be analyzed in the same model without any risk of collinearity among the environmental variables.

[Insert Table 2 about here]

Regression results

In order to assess the factors that determine the export-oriented behaviour of early-stage entrepreneurs, we estimate different models including individual and firm-specific control variables at level-1 as well as regional explanatory variables at level-2. The results with environmental determinants at the regional level-2 unit are presented in Table 3. Most control variables are statistically significant, and have the expected sign. Furthermore, their effect is consistent across models.

[Insert Table 3 about here]

Results on the impact of the environment's FDI activity

According to Table 3, early-stage entrepreneurs included in the sample show a relatively higher propensity to engage in export activities when they are exposed to a higher presence of foreign firms sharing the same regional environment. The coefficient for the natural logarithm of *Inward FDI* at regional level is significantly positive (Model 2). One-unit increase in the natural logarithm of inward FDI flows per firm

for a given region raises by 0.045 the log odds of an early-stage entrepreneur in such region being export-oriented instead of non-export oriented, holding the other predictor variables constant; and this increase is significant at the 0.10 level. In a more meaningful way, if we compare an early-stage entrepreneur located in the region which has the highest *Inward FDI*'s value with other entrepreneur located in the region which has the lowest *Inward FDI*'s value, the former is 1.28 times more likely to be export-oriented than the latter.⁶

On the contrary, the exposure to other domestic firms carrying out outward FDI activities from the same regional environment seems to have no impact on the propensity of early-stage entrepreneurs' new ventures to export. Although the coefficient for the natural logarithm of *Outward FDI* at regional level is positive as we expected, it is not statistically significant (Model 3). Thus, according to our results, the presence of outward FDI activities in a given region does not considerably increases the probability that an early-stage entrepreneur in that region is export-oriented.

Consistent with the previous findings, the extent to which the regional environment is characterized by a relatively higher presence of inward FDI activities in comparison to outward FDI activities positively affects the export-oriented behaviour of early-stage entrepreneurs. In Model 4, we consider both kinds of flows (i.e., inward and outward FDI) into a single measure of total FDI, along with the percentage of it pertaining to inward flows. While one-unit increase in the natural logarithm of *Total FDI* at regional level significantly raises the log odds by 0.056 (p-value lower than 0.05), one-unit increase in the *% of inward FDI* significantly raises the log odds by 0.003 (p-value lower than 0.10). Assuming that all other explanatory variables remain constant, this means that an early-stage entrepreneur located in the region with the highest amount of total FDI per firm is 1.38 times more likely to be export-oriented than an entrepreneur located in the region with the lowest amount of total FDI per firm. In addition to that, if we compare an early-stage entrepreneur located in the region which has the highest proportion of inward FDI over total FDI per firm with other entrepreneur in the region which has the lowest value of that proportion, the former is 1.21 times more likely to be export-oriented than the latter.

These findings hold when we take into account the impact of the other environmental variable under analysis, namely the level of accumulated knowledge in the region (Model 6). Thus, we can assert that the

⁶ As the explanatory variables at environmental level are transformed into natural logarithms, the interpretation of their coefficients is not straightforward. However, we can interpret these coefficients by using the minimum and maximum value of the non-transformed variable, which are provided in the descriptive statistics table. Holding the other explanatory variables constant, the expected log odds difference between an early-stage entrepreneur operating in a region or industry which has the maximum value in a given environmental variable, $W_{jk}(\text{Max})$, and other early-stage entrepreneur operating in a region or industry which has the minimum value in such environmental variable, $W_{jk}(\text{Min})$, is $\gamma_{0i} * (\ln(\text{Max}) - \ln(\text{Min})) = \gamma_{0i} * \ln(\text{Max}/\text{Min})$; and the corresponding odds ratio is $\exp[\gamma_{0i} * \ln(\text{Max}/\text{Min})]$.

joint impact inward and outward FDI flows on the export-oriented behaviour of early-stage entrepreneurs is significantly positive, and that such impact is even stronger when the proportion of inward flows over the total amount of FDI is higher than the proportion of outward flows.

The results we obtained allow us to accept the hypothesis H1, which suggest that early-stage entrepreneurs in regions with a higher exposure to inward FDI are more likely to be export-oriented. However, we cannot accept or reject hypothesis H2 regarding the effect of outward FDI at regional level.

Results on the impact of the environment's accumulated knowledge

Table 3 also shows that the availability of external knowledge in the regional environment does not affect the export-oriented behaviour of early-stage entrepreneurs. In model 5, the coefficient for the natural logarithm of *R&D stock* is positive, but statistically insignificant and close to zero. Surprisingly, this coefficient becomes negative and moves away from zero when all regional variables are included in the same estimation (Model 6),⁷ but it remains statistically insignificant. Therefore, the benefits derived from the geographic concentration of knowledge (Audretsch & Feldman, 1996) are not large enough as to enable early-stage entrepreneurs included in the sample to develop competitive advantages with which they can successfully enter foreign markets.

In view of that, we cannot accept or reject the hypothesis H3, which suggests that early-stage entrepreneurs operating in regions which have a higher stock of technological knowledge are more likely to be export-oriented.

Conclusions and implications

The present study responds to calls by scholars who have encouraged more research on the role of the environment on international entrepreneurship. Attracting FDI and encouraging direct investment of domestic firms abroad are part of the development policies in developed and developing countries. Likewise, based on the belief that knowledge spills across economic agents, countries around the world have made great efforts in generating new knowledge to drive economic growth. While most previous studies on FDI have concentrated on the productivity effects, most previous studies on the role of knowledge spillovers have on focused on the innovation outcome. This research contributes to the literature stream by analyzing other type of effects from FDI and external knowledge.

⁷ Although these changes make the model suspicious of collinearity among the regional variables, VIF scores provide evidence of no multi-collinearity. Moreover, the coefficients for other regional variables remain significant and do not change in a noticeable way, which suggests that they are consistent and that multi-collinearity is not a problem.

In particular, we have provided evidence on the relationship between inward FDI flows at regional level and the export-oriented behaviour of early-stage entrepreneurs at individual level. Our findings complement those of prior studies which have provided evidence on the propensity of a new venture to export as a result of the imitation of other organizations located in the same environment (Fernhaber & Li, 2010; Lu, 2002). For instance, while Fernhaber & Li (2010) found that international expansion among IPO new ventures based in the U.S. may be the result of the imitation of certain organizations from the same national industry which are involved in exporting, the present study shows that this mimetic behaviour holds in Spain when new ventures are exposed to foreign firms in their regional environment⁸, but not when they are exposed to foreign firms in their industrial environment⁹. Likewise, the results support De Clercq, et al.'s (2008) findings suggesting that inward FDI activities has a positive effect on the proportion of export-oriented entrepreneurs in high-income countries. In particular, the present study provides evidence of the relationship between inward FDI at regional level and export-oriented behaviour of early-stage entrepreneurs at individual level, while De Clercq, et al. (2008) provide evidence of such relationship only at country level. Our findings also reveal that the environment's accumulated knowledge for the export orientation of an entrepreneur seems to be not important within the region in which he/she is located. Perhaps, the use of external knowledge as a resource for entering foreign markets must be linked to the technological base of an entrepreneur's new venture, which is not captured through geographical proximity, but through industrial similarity. Consistent with this view, early and fast internationalization is more common in high technology industries in which firms are characterized by high levels of knowledge intensity (Autio, Sapienza, & Almeida, 2000), due in part to the fact that they have increased access to external knowledge. Not surprisingly, first international new ventures were identified in those industries (Jolly, et al., 1992; Knight & Cavusgil, 2004; Oviatt, et al., 1993).

These results, however, cannot be generalized since Spanish regions have considerable differences that may not be present in other country's regions. Moreover, as any research, this investigation is subject to some limitations. First, we have relied on a proxy measure of export orientation which is dichotomous. It would be desirable to have had a more flexible measure to capture the intensity of export activity in a continuous way, or, even better, to have had several variables measuring internationalization in its different dimensions (i.e., speed, scope and intensity). Second, our models rely on certain assumptions concerning the regional boundaries of the early-stage entrepreneur's new venture. More specifically, we have assumed that new ventures are located and operate in a single location. However, entrepreneurs - especially global-oriented ones - often create new activities that are orchestrated from different locations.

⁸ Note that we refer to the regional environment regardless of the industry in which inward FDI activities are carried out by foreign firms.

⁹ In this case, we refer to the industrial environment regardless of the Spanish region in which inward FDI activities by foreign firms are located.

The different locations in which an entrepreneur acts represent the actual environment affecting his/her entrepreneurial decisions. The lack of proper and reliable data limits the analysis of such complex relations. Third, the main argument behind the relationship between the presence of foreign firms in a given environment and the export-oriented behaviour of early-stage entrepreneurs is that the latter adopt an export-oriented behaviour as a mimetic response to the exposure to the international activities of the former. This relationship could be expected in the case that entrepreneurs imitate foreign firms, but it is not explicitly tested in this research, nor it has been tested in previous works either (Fernhaber & Li, 2010). Thus, we acknowledge that this relationship could also emerge for other reasons, although we argue that in the long term the spread of an export-oriented behaviour among early-stage entrepreneurs is arguably driven by an isomorphism process.

This research raises some implications for policy and research. On the one hand, by creating incentives and providing resources, policy makers are able to influence organizational behaviours. In this way, our findings suggest that policy makers must attract inward FDI at regional level if they seek a higher percentage of entrepreneurial activity to be involved in international activities. On the other hand, future research could address the role of imitation and overcome some of our limitations by using primary data collected in a proper way. Additional insights would be gained from secondary data if they allowed longitudinal analysis or provided more accurate measurement of export orientation and its determinants. The lack of proper data prevented us to address additional issues such as the role of entrepreneur's human capital, which is essential to benefit from external forces according to the literature on absorptive capacity (Cohen & Levinthal, 1990). For instance, high-skilled entrepreneurs can benefit more from the exposure to FDI and external knowledge than low-skilled entrepreneurs. Future research could advance in this regard by analyzing the interactions between specific human capital skills and the alternative typologies of environmental conditions. Another avenue for future research is the motivation behind FDI activities. Dunning (1993) distinguishes four different motivations for an organization to engaged in FDI: resource seeking, market seeking, efficiency seeking and asset seeking. The effect of FDI on the export orientation can be different depending on the FDI motivation. For instance, early-stage entrepreneurs exposed to asset seeking FDI may be more influenced to mimic an export-oriented behaviour than those exposed to FDI activities driven by market seeking motivations. Finally, the origin of the funding for external knowledge (i.e., public versus private) can be a factor that facilitates or restricts its use to introduce innovations and reach foreign markets. Similarly, the origin of FDI can be determinant since positive spillovers from it are more likely when investments come from or goes to advanced industrial economies (Blomström & Kokko, 1998).

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Table 1: Descriptive statistics

Dependent variable	Mean	s.d.	Min.	Max.	Obs.
<i>Export</i>	0.36	0.48	0.00	1.00	5,794
Independent variables	Mean	s.d.	Min.	Max.	Obs.
Individual and firm-specific level, N=5,794					
<i>Male</i>	0.59	0.49	0.00	1.00	5,794
<i>Age</i>	39.61	11.10	18.00	65.00	5,794
<i>Immigrant</i>	0.10	0.31	0.00	1.00	5,794
<i>Graduate experience</i>	0.34	0.47	0.00	1.00	5,794
<i>Recent experience</i>	0.04	0.19	0.00	1.00	5,794
<i>Investor experience</i>	0.08	0.27	0.00	1.00	5,794
<i>Opportunity alertness</i>	0.38	0.49	0.00	1.00	5,794
<i>Entrepreneurial skills</i>	0.92	0.28	0.00	1.00	5,794
<i>No fear of failure</i>	0.31	0.46	0.00	1.00	5,794
<i>Number of employees</i>	2.00	4.70	0.00	100.00	5,794
<i>Expected growth</i>	3.20	9.03	-25.00	282.00	5,794
<i>Number of founders</i>	1.83	1.19	1.00	10.00	5,794
<i>New to all customers</i>	0.18	0.39	0.00	1.00	5,794
<i>New technology base</i>	0.06	0.24	0.00	1.00	5,794
Regional level, N=17					
<i>Inward FDI</i>	3.47	7.07	0.10	24.86	5,794
<i>Outward FDI</i>	13.69	29.55	0.30	182.11	5,794
<i>Total FDI</i>	17.16	33.04	0.61	182.87	5,794
<i>% of inward FDI</i>	29.97	16.99	0.42	63.68	5,794
<i>R&D Stock</i>	11.33	6.47	2.52	25.00	5,794

Notes: All monetary values in thousands of Euros

Table 2: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Individual and firm-specific control variables																			
(1) <i>Male</i>	1.00																		
(2) <i>Age</i>	-0.03*	1.00																	
(3) <i>Immigrant</i>	-0.01	-0.06***	1.00																
(4) <i>Number of founders</i>	0.03**	0.01	-0.02	1.00															
(5) <i>Graduate experience</i>	0.01	-0.09***	0.06***	0.06***	1.00														
(6) <i>Investor experience</i>	0.04***	-0.01	0.01	0.06***	0.07***	1.00													
(7) <i>Recent experience</i>	0.02†	-0.02	0.00	0.01	0.02	0.18***	1.00												
(8) <i>Entrepreneurial skills</i>	0.01	0.00	0.02	0.00	0.03*	0.02	0.01	1.00											
(9) <i>No fear of failure</i>	-0.07***	-0.01	0.00	0.02	-0.03*	0.02	0.01	-0.1***	1.00										
(10) <i>Opportunity alertness</i>	0.05***	-0.05***	0.04**	0.02	0.05***	0.05***	0.03*	0.09***	-0.07***	1.00									
(11) <i>Number of employees</i>	0.00	0.02	-0.02†	0.07***	0.00	0.04**	0.02	0.00	-0.04**	0.00	1.00								
(12) <i>Expected growth</i>	0.04**	-0.01	0.01	0.06***	0.02†	0.07***	0.03*	0.01	-0.03*	0.04**	0.05***	1.00							
(13) <i>New to all customers</i>	-0.03†	-0.02	0.03**	0.03†	0.05***	0.03*	0.03*	0.03*	-0.01	0.04**	0.02	0.06***	1.00						
(14) <i>New technology base</i>	0.01	-0.05***	0.05***	-0.01	0.05***	0.06***	0.03†	0.01	-0.01	0.02	-0.06***	0.05***	0.09***	1.00					
Regional level explanatory variables																			
(15) <i>Inward FDI</i>	0.02†	-0.01	0.07***	0.01	0.06***	0.02	0.04***	-0.01	-0.02	0.03*	0.01	-0.01	0.03*	0.02	1.00				
(16) <i>Outward FDI</i>	-0.01	0.00	0.01	0.01	0.04**	0.00	0.02	0.00	-0.02	0.02	0.03*	-0.02	0.00	-0.03*	0.40***	1.00			
(17) <i>Total FDI</i>	-0.01	0.00	0.02	0.01	0.05***	0.00	0.03*	0.00	-0.02	0.02	0.03*	-0.02	0.01	-0.02†	0.57***	0.98***	1.00		
(18) <i>% of inward FDI</i>	0.02	-0.01	0.05***	0.01	-0.02	0.00	0.00	0.00	0.02	0.00	-0.01	0.04**	0.02	0.03**	0.08***	-0.35***	-0.30***	1.00	
(19) <i>R&D stock</i>	0.00	0.00	0.05***	0.02†	0.07***	0.00	0.03*	-0.03*	-0.04**	0.03*	0.00	-0.02	0.01	-0.04**	0.74***	0.38***	0.50***	-0.19***	1.00

Notes: Correlations among continuous variables are Pearson's correlation coefficients, whereas correlations among dichotomous variables, as well as between continuous and dichotomous variables are measured by phi coefficients and point biserial coefficients, respectively. Reported coefficients of the aggregate (regional and industry) variables are for their corresponding log values. Level of statistical significance for the two-tailed test: *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p \leq .10$

Table 3: Mixed-effect logit regression for individual, firm-specific and regional level determinants of the export-oriented behaviour of early-stage entrepreneurs

		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Male_{ij}</i>		0.129* (0.057)	0.128* (0.057)	0.13* (0.057)	0.129* (0.057)	0.129* (0.057)	0.129* (0.057)
<i>Age_{ij}</i>		0.000 (0.003)	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)	0.000 (0.003)
<i>Age²_{ij}</i>		0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Immigrant_{ij}</i>		0.519*** (0.089)	0.513*** (0.089)	0.519*** (0.089)	0.51*** (0.089)	0.519*** (0.089)	0.513*** (0.089)
<i>Graduate experience_{ij}</i>		0.116† (0.060)	0.113† (0.06)	0.112† (0.06)	0.112† (0.06)	0.115† (0.06)	0.114† (0.06)
<i>Recent experience_{ij}</i>		0.288* (0.142)	0.277† (0.142)	0.281* (0.142)	0.273† (0.142)	0.288* (0.142)	0.269† (0.142)
<i>Investor experience_{ij}</i>		0.125 (0.106)	0.126 (0.106)	0.125 (0.106)	0.127 (0.106)	0.125 (0.106)	0.126 (0.106)
<i>Opportunity alertness_{ij}</i>		0.146* (0.058)	0.145* (0.058)	0.145* (0.058)	0.145* (0.058)	0.146* (0.058)	0.147* (0.058)
<i>Entrepreneurial skills_{ij}</i>		0.260* (0.107)	0.263* (0.107)	0.261* (0.107)	0.264* (0.107)	0.26* (0.107)	0.262* (0.107)
<i>No fear of failure_{ij}</i>		0.151* (0.061)	0.153* (0.061)	0.154* (0.061)	0.153* (0.061)	0.152* (0.061)	0.15* (0.061)
<i>Number of employees_{ij}</i>		0.011† (0.006)	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)	0.011† (0.006)
<i>Expected growth_{ij}</i>		0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)
<i>Number of founders_{ij}</i>		0.002 (0.024)	0.001 (0.024)	0.002 (0.024)	0.001 (0.024)	0.002 (0.024)	0.001 (0.024)
<i>New to all customers_{ij}</i>		0.663*** (0.070)	0.663*** (0.07)	0.664*** (0.07)	0.663*** (0.07)	0.663*** (0.07)	0.663*** (0.07)
<i>New technology base_{ij}</i>		0.423*** (0.113)	0.430*** (0.113)	0.431*** (0.113)	0.43*** (0.113)	0.423*** (0.113)	0.425*** (0.113)
<i>Ln(Inward FDI_j)</i>			0.045† (0.025)				
<i>Ln(Outward FDI_j)</i>				0.032 (0.021)			
<i>Ln(Total FDI_j)</i>					0.056* (0.023)		0.078** (0.027)
<i>% of inward FDI_j</i>					0.003† (0.002)		0.003† (0.002)
<i>Ln(R&D stock_j)</i>						0.002 (0.067)	-0.104 (0.073)
<i>Intercept</i>		-1.304*** (0.128)	-1.302*** (0.127)	-1.340*** (0.130)	-1.488*** (0.151)	-1.309*** (0.198)	-1.279*** (0.207)
Random effects:	<i>s.d.(Intercept)</i>	0.092* (0.04)	0.075† (0.041)	0.079* (0.040)	0.061 (0.043)	0.092* (0.040)	0.043 (0.052)
Region	<i>var (Intercept)</i>	0.008 (0.007)	0.006 (0.006)	0.006 (0.006)	0.004 (0.005)	0.008 (0.007)	0.002 (0.005)
Deviance (-2 ll)		7,345.25	7,342.09	7,342.94	7,339.22	7,345.25	7,337.31
Deviance difference			3.16†	2.31	6.03*	0.00	7.95*

Notes: N=5,794 at individual level and N=17 at regional level. The exponent of the coefficient is the odds ratio. The deviance difference is calculated against Model 1 which includes the individual and firm-specific control variables. Standard errors are in parentheses. Level of statistical significance: *** p ≤ .001, ** p ≤ .01, * p ≤ .05, † p ≤ .10