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Knowledge Spillovers and Entrepreneurs' Export Orientation

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EXECUTIVE SUMMARY

There is increasing evidence that firms engage in international activities early on in their existence. Consequently, both the entrepreneurship and economics literatures have devoted an increasing amount of attention to the role and importance of entrepreneurs' international activities. In this study we extend the entrepreneurship and economics literatures by examining macro-level antecedents and outcomes of entrepreneurs' export orientation.

On the one hand, the literature on international entrepreneurship has mainly focused on the role of individual and firm-level drivers for early internationalization. Such an approach may have overlooked important macro-level determinants of a country's international entrepreneurial activity. We believe that the use of economics as a theoretical lens may enhance our understanding of a somewhat under-explored issue in the entrepreneurship literature: To what extent is entrepreneurs' export orientation influenced by the characteristics of the economic environment in which the entrepreneurs are embedded?

On the other hand, researchers in economics have emphasized the importance of international business activities for national economies. However, despite the various insights provided by the economics literature with respect to the role of internationalization, this literature has strongly focused on the importance of established corporations and large multinational enterprises, and has paid less attention to the role of start-ups in international markets. In this study we address this gap by examining how country characteristics influence the export behavior of one particular group of economic actors, i.e., individuals who set up a new business.

Furthermore, in addition to studying macro-level antecedents of entrepreneurs' export orientation, we also focus on one potential, but important, consequence of such orientation. That is, we extend the literature by suggesting that the export orientation of a country's entrepreneurs may to an important extent 'spill over' to the emergence of (more) new companies within the country's borders.

Our theoretical framework is based on the stream in the economics literature that emphasizes the role of knowledge spillovers in the creation of economic growth. We argue that

one particular type of spillover that may affect a country's economic activities pertains to export spillovers. More specifically, we hypothesize that entrepreneurs' exposure to different sources of (international) knowledge spillovers may increase their export orientation. We consider four possible sources of knowledge spillovers for entrepreneurs: inward FDI, outward FDI, export and import. We also argue that entrepreneurs' export activities may in turn create spillovers that positively affect a country's overall level of entrepreneurial activity, and as such we contribute to the literature by examining one particular type of 'entrepreneurship spillovers.'

We test our hypotheses based on an unbalanced panel dataset including 34 countries over a four-year time period (2002-2005). Our data are drawn from different data sources, including the Global Entrepreneurship Monitor, the Foreign Direct Investment database maintained by the United Nations Conference on Trade and Development, the World Bank, the Global Competitiveness Report, and the World Competitiveness Yearbook.

We find support for the presence of spillover effects from three different sources. More specifically, we find that a country's outward FDI, export and import positively influence entrepreneurs' export orientation. However, contrary to our expectations, we do not find a spillover effect from inward FDI. Finally, we do find empirical support for the spillover effect from export-oriented entrepreneurship to a country's overall level of entrepreneurial activity.

One implication of our findings is that entrepreneurs whose ambitions are to become an important player in the international arena may benefit from locating themselves in areas where other international players are concentrated. Also, from a country perspective, governments that wish to encourage export activities among their entrepreneurs may benefit from creating geographical zones which are specifically reserved for internationally oriented firms. Furthermore, the results of our study also suggest that governments may benefit from promoting import activity and outward FDI among their home-based firms, rather than focusing only on the promotion of export or inward FDI. An increased level of international trade (both export and import), in combination with outward FDI, may stimulate entrepreneurs' involvement in export activities, and this may ultimately foster a country's economic prosperity.

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ABSTRACT

We draw upon the economics literature, and the literature on knowledge spillovers in particular, to examine to what extent a country's level of foreign direct investment (both inward and outward) and international trade (export and import) influence the export orientation of its entrepreneurs. We also examine the relationship between entrepreneurs' export orientation and a country's overall level of entrepreneurial activity. We test our hypotheses using macro-level data on 34 countries over a four-year time period (2002-2005). We find that a country's outward foreign direct investment as well as its export and import positively influence entrepreneurs' export orientation. We also find that the extent to which a country's entrepreneurs engage in export-oriented activities affects the subsequent emergence of new businesses within the country's borders. We discuss our findings, and point to the study's implications, limitations and future research possibilities.

Keywords: knowledge spillovers, export orientation, country-level entrepreneurship

INTRODUCTION

There is increasing evidence that firms engage in international activities early on in their existence. Some ventures are even 'born global' and intend to reap the benefits from establishing an immediate presence in the international market place (Knight & Cavusgil, 1996; McDougall & Oviatt, 2000). The enhanced international opportunities for new firms have been linked to several factors such as an increasing economic integration, advancements in production, transportation and communication technologies, the availability of internationally-experienced executives, and countries' specialization in knowledge-based activities (e.g., Autio et al., 2000; Dunning, 1993; Knight & Cavusgil, 1996; Oviatt & McDougall, 2005). Consequently, both the entrepreneurship and economics literatures have

devoted an increasing amount of attention to the role and importance of entrepreneurs' international activities.

On the one hand, the literature on international entrepreneurship has focused on the role of individual and firm-level drivers for early internationalization. For instance, the early entry by new firms into foreign markets has been related to factors such as the entrepreneur's international experience or the firm's entrepreneurial orientation (Autio et al., 2000; McDougall et al., 1994; Sapienza et al., 2005). However, while many studies in this literature implicitly point to the importance of changing environmental conditions (e.g., globalization) to explain the emergence of international start-ups, its empirical contributions tend to focus on individual and firm-level explanations for early-stage internationalization. Such an approach may thus overlook important macro-level determinants of a country's international start-up activity. Consequently, we believe that the use of economics as a theoretical lens may enhance our understanding of a somewhat under-explored issue in the entrepreneurship literature: To what extent is entrepreneurs' international orientation influenced by the characteristics of the economic environment in which they are embedded? We will focus on one particular aspect of entrepreneurs' international orientation, i.e., the extent to which they engage in *export* activities. This focus is consistent with prior research that pointed to the importance of export for young entrepreneurial firms (e.g., Burpitt & Rondinelli, 2000; Campbell, 1996).

On the other hand, researchers in economics have emphasized the importance of international business activities for national economies. For example, it has been argued that countries with a high number of export-oriented firms may enhance their international competitiveness since such firms may help to foster modernization and living conditions (Girma et al., 2004). Also, it is widely recognized that foreign direct investment (FDI) may

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contribute to a host country's economic growth, e.g. by providing employment, capital inflow and technology spillovers to indigenous firms (Acs et al., 2006; Blomström & Kokko, 1998). In developing and transition countries in particular, *inward FDI* may be an important vehicle for economic development (Aitken & Harrison, 1992; Blomström, 1986; Blomström & Kokko, 1998; Haddad & Harrison, 1993; Nevin & Siotis, 1996; Rivera-Batiz & Rivera-Batiz, 1991). Furthermore, the economics literature has also pointed out that *outward FDI* may have a positive impact on an economy, e.g. by transferring resources gained from foreign market access back to the home country (e.g., Dunning, 1993), and that international trade (i.e., export and import activity) may provide access to foreign technology and therefore contribute to the upgrading of a country's products and services (e.g., Blalock & Veloso, 2005; Glass & Saggi, 1998; Sjoholm, 1996). However, despite the various insights provided by the economics literature with respect to the role of internationalization, this literature has strongly focused on the importance of established corporations and large multinational enterprises (i.e., MNEs), and has paid less attention to the role of start-ups in international markets (Audretsch & Thurik, 2000). In this study we attempt to address this gap by examining how country characteristics influence the export behavior of one particular group of economic actors, i.e., individuals who set up a new business.

In short, we intend to contribute to the entrepreneurship and economic literatures by explaining why countries differ with respect to the export orientation of their entrepreneurs. Furthermore, in addition to studying macro-level *antecedents* of entrepreneurs' export orientation, we will also focus on one potential, but important, *consequence* of such orientation. That is, to what extent does entrepreneurs' export orientation in turn affect a country's overall level of (early-stage) entrepreneurial activity? Prior research has pointed to the impact of the

increasing globalization on the emergence of new companies within countries' borders. For instance, it has been argued that an increasing openness towards external markets provides various opportunities for a country's economic actors to set up new companies given the various opportunities generated by and enhanced access to new technologies and business practices (Audretsch & Thurik, 2000). We will extend this literature by suggesting that one particular aspect of a country's international character, i.e., the export orientation of its entrepreneurs, may to an important extent generate *spillovers* that result in the emergence of (more) new companies within the country's borders. More specifically, while it is commonly acknowledged that entrepreneurship may generate substantial benefits to the rest of the economy, it has been argued that the study of spillovers resulting from entrepreneurship remains an under-investigated topic in the economics literature (Parker, 2005). We intend to address this gap by focusing on spillovers stemming from one particular type of entrepreneurship, i.e. export-oriented entrepreneurship.

The remainder of the paper is structured as follows. In the theory and hypotheses sections, we rely on the economics literature on *spillovers* in arguing that the export orientation of countries' entrepreneurs should be studied in relationship to the broader economic environment in which the entrepreneurs are embedded. First, we rely on prior research that speaks to the role of inward foreign direct investment (FDI) in shaping a country's economic activities (Blomström & Kokko, 1998; Haddad & Harrison, 1993; Rivera-Batiz & Rivera-Batiz, 1991), and we extend this research by focusing on one particular type of economic activity, i.e., the exporting behavior of a country's entrepreneurs. Second, we will argue that not only *foreign* firms that set up affiliates within a host country's borders (i.e., foreign MNEs that undertake inward FDI) but also *home-based* firms may affect entrepreneurs' export orientation (Blomström

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& Kokko, 1998). More specifically, we examine the role played by a country's level of outward FDI as well as its overall level of international trade (i.e., export and import) in shaping entrepreneurs' export decisions. Finally, we will argue that the export orientation of a country's entrepreneurs may in turn result in spillovers that positively affect its overall level of (early-stage) entrepreneurial activity. In the remaining sections of the paper, we will detail our research methodology, present the empirical results, and discuss the study's findings, implications, limitations, and future research possibilities.

THEORETICAL BACKGROUND

Economic theory and the role of spillovers

Our theoretical framework is based on the wider economic literature that emphasizes the role of knowledge spillovers in the creation of economic growth. The term *spillover* pertains to the transfer of knowledge across economic players. It has been argued that such spillovers may ultimately lead to productivity gains (Coe & Helpman, 1995; Jaffe et al., 1993; Marshall, 1920). For instance, spillovers allow firms to acquire knowledge from other economic players without having to pay for that knowledge in a formal market transaction (Acs et al., 1994; Bernstein & Nadiri, 1988). Furthermore, endogenous growth theory emphasizes that the engine of a country's economic growth stems from the endogenous development of knowledge through spillover effects (Romer, 1986). More specifically, a country's economic prosperity is in important ways influenced by the accumulation and *spillover* of knowledge through positive externalities.

Other researchers have further developed this theoretical approach by examining the consequences of both domestic and international knowledge spillovers for a country's growth rate (Bernstein & Mohnen, 1998; Grossman & Helpman, 1991). For instance, Grossman and Helpman

(1991) explained how cross-border movements of capital and trade affect economic growth through the occurrence of knowledge spillovers related to these movements. Also, many studies on the role of spillovers have focused on the importance of inward FDI in generating knowledge flows from foreign MNEs to a host country's domestic firms (e.g., Feinberg & Majumdar, 2001; Fosfuri et al., 2001). A general assumption in this research is that MNEs tend to possess superior knowledge when entering foreign markets, which allows them to successfully compete with local firms in foreign markets (Dunning, 1981; Hymer, 1976). However, since such knowledge-based assets are often intangible in nature, and therefore difficult to be (fully) internalized, they may spill over to domestic firms. For instance, an important focus in the literature has been on the presence of *technology* spillovers from foreign MNEs to domestic firms (e.g., Feinberg & Majumdar, 2001; Glass & Saggi, 1998).

One particular type of spillover that may affect a country's economic activities pertains to *export* spillovers. That is, domestic firms may be more inclined to engage in export activities if they are exposed to other economic actors' international activities (Aitken et al., 1997; Greenaway et al., 2004). For instance, Aitken et al. (1997) provided evidence for the spillover effect from foreign MNEs to domestic export activity in Mexican manufacturing industries. More specifically, they found that the dominance of foreign MNEs in a particular industry sector increases the probability of whether a domestic firm in that same sector is an exporter. Similarly, Greenaway et al. (2004) used UK data to show that foreign MNEs' export activities have a positive effect on a domestic firm's probability of being an exporter. Overall, an important reason for these spillover effects is that one firm's international activities may reduce the costs of penetrating foreign markets for other firms, e.g., through the establishment of supplier-buyer

linkages and imitation effects (Aitken et al., 1997). This issue will be further elaborated upon in the hypotheses section of the paper.

Knowledge spillovers and entrepreneurs

We extend the economics literature on spillovers by focusing on what we believe is an under-explored type of spillover effect, i.e., spillovers that influence the export behavior of a country's (early-stage) *entrepreneurs*.[1] Our focus on entrepreneurs is guided by the importance of new businesses in general for economic growth, as mentioned above and as evidenced by the literature (e.g., Thurik & Wennekers, 2004; van Stel et al., 2005). Furthermore, it has also been argued that some types of entrepreneurship may contribute more to economic growth than others (Baumol, 1990). For instance, it has been argued that internationally oriented start-ups may be of great importance for achieving economic growth, in that international expansion is beneficial for the start-ups themselves through their access to new technologies and potentially more profitable markets, which subsequently may increase a country's overall prosperity (Cavusgil & Zou, 1994). Furthermore, our reliance on the literature on spillovers to explain *entrepreneurs'* export behavior is also influenced by the argument that smaller firms may benefit to a greater extent from knowledge spillovers compared to larger firms (Acs et al., 1994). More specifically, for less mature firms (and start-ups in particular) the spillovers received from external organizations may be a major input in their knowledge production function, whereas for more mature firms, external knowledge spillovers may be less important because those firms are more likely to also gain from internal knowledge spillovers, e.g., through the international experience embedded in the firms' employees (Acs et al., 1994).

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[1] Throughout the paper we use the terms 'entrepreneurs,' 'early-stage entrepreneurs,' and 'start-ups' as synonyms, as they pertain to individuals' involvement in new businesses during their emergence and early years of existence.

In essence, we will hypothesize that domestic entrepreneurs' exposure to different *sources* of (international) knowledge spillovers may increase their export orientation. We consider four possible sources of knowledge spillovers for domestic entrepreneurs. That is, we do not focus only on the influence of *foreign* MNEs through inward FDI on entrepreneurs' export orientation, but also examine the potential role of domestic or *home-based* firms (either home-based MNEs or other home-based firms) that engage in FDI and international trade (i.e., export or import).

Channels for spillover effects

In order to better understand how knowledge with regard to international activities may spill over to a country's entrepreneurs, it is important to identify the channels for such spillovers. Traditionally, the literature on the role of *inward FDI* has pointed to four possible channels through which knowledge may spill over to a host country's economic actors. First, market access spillovers can occur through commercial linkages between foreign MNEs and local suppliers, which may give local firms access to new technological capabilities as well as foreign customers' preferences regarding issues such as product design and quality (Aitken et al., 1997; Barrell & Pain 1997; Blomström & Kokko, 1998). Second, and closely related to the first possibility, a demonstration or imitation effect may take place when domestic firms copy foreign MNEs' organizational practices, either through formal inter-firm collaboration or through more informal channels (Wang & Blomström, 1992). Third, a training effect may occur when local employees gain important skills while working for a foreign MNE, and subsequently transfer to other organizations (Fosfuri et al., 2001). Finally, foreign entrants may increase local competition, e.g., through the infusion of new technologies into the local market, and subsequently act as a catalyst for domestic firms to become more competitive (Barrell & Pain

1997; Cantwell, 1989; Chuang & Lin 1999; Glass & Saggi, 1998). In the hypotheses outlined below, we will argue that the channels mentioned above are to an important extent also relevant when considering sources of knowledge spillovers *different* from inward FDI – i.e., outward FDI, export and import – for explaining entrepreneurs' export orientation.

HYPOTHESES

Inward FDI and entrepreneurs' export orientation

We hypothesize that foreign MNEs (through inward FDI) may act as catalysts for domestic entrepreneurs' involvement in export activities. Several reasons can be given for the positive relationship between a country's inward FDI and the export orientation of its entrepreneurs. First, a direct channel through which foreign MNEs can facilitate export among domestic entrepreneurs is when the latter are suppliers or sub-contractors to the MNEs. More specifically, the commercial linkages with foreign MNEs may provide domestic entrepreneurs with knowledge about new technological developments as well as foreign market conditions (e.g., foreign customers' product preferences), and over time, this knowledge can work favorably in entrepreneurs' decision to export themselves (Blomström & Kokko, 1998). Also, foreign MNEs may pave the way for entrepreneurs to enter the same export markets as they service themselves, either because MNEs have created adequate transport infrastructure or because they disseminate knowledge about specific foreign markets that can also be directly used by domestic entrepreneurs. Alternatively, in some cases, foreign MNEs may simply have overcapacity with respect to their distribution or marketing facilities, which may offer opportunities for domestic entrepreneurs.

Another mechanism through which inward FDI may enhance domestic entrepreneurs' export orientation is entrepreneurs' exposure to MNE practices either through formal alliances or

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informal exchanges such as joint memberships in trade associations (Greenaway et al., 2004). For instance, prior research has emphasized the role of imitation as an important mechanism through which knowledge on new product development spills over across economic actors, and there is indeed empirical evidence on the practice of reverse engineering when technology is transferred across national borders (e.g., Wang & Blomström, 1992). We extend this rationale to the context of exporting, and suggest that such demonstration or imitation effects may also take place as domestic entrepreneurs use foreign MNEs' behavior as a role model for their own decision making (Powell & DiMaggio, 1991).

Furthermore, spillover effects from foreign MNEs may also take place through domestic entrepreneurs' acquisition of human capital. Prior research has suggested that it is difficult for foreign MNEs to *lock-in* their human capital (Djankov & Hoekman, 1999; Dunning, 1981; Fosfuri et al., 2001). As foreign MNEs often demand a skilled labor force when entering a host country, they may organize training for their local employees, and employees' subsequent move from MNEs to other firms may greatly contribute to the diffusion of knowledge within the host country (Gerschenberg, 1987). Similarly, we reason that the various skills with regard to internationalization while working for a foreign affiliate may spill over to domestic employees, who may then subsequently decide to leave their foreign employer and set up their own business. There is indeed empirical evidence for the role of prior international experience in entrepreneurs' decision to enter foreign markets (McDougall et al., 1994).

Finally, unless a foreign MNE is offered a monopoly status in its host country, inward FDI will most likely also lead to increased local competition. For instance, it is widely recognized that foreign MNEs may infuse new technologies into their host countries, and that the technology adopted by their affiliates may spread to local firms and yield technological benefits

(Barrell & Pain, 1997). Furthermore, foreign affiliates may replace inefficient firms in the host country, which may ultimately promote the host country's economic growth (Narula & Marin, 2003). Similarly, we reason, then, that the increased competition resulting from inward FDI may provide local start-ups with the need and capabilities to successfully expand the geographical scope of their activities. That is, the increase in competition that occurs as a result of foreign entry may lead domestic entrepreneurs to expand their horizon and engage in export activities.

> *Hypothesis 1: A country's inward flow of foreign direct investment is positively related to the export orientation of its entrepreneurs.*

Outward FDI and entrepreneurs' export orientation

Although the literature on the impact of FDI on a host country's economic activities has mostly focused on spillover effects stemming from inward rather than outward FDI, we believe that home-based MNEs may also have an important influence on domestic entrepreneurs' export orientation (Blomström & Kokko, 1998). More specifically, we argue that an additional spillover effect on entrepreneurs' decision to engage in export activities may result from a country's outward FDI. In fact, the literature shows some controversy about the potential positive effect of outward FDI on a home country's economy. For instance, the presence of outward FDI has been associated with the 'hollowing out' of a home economy in that resources and jobs may be transferred to other economies (Jones, 1996). One could therefore argue for a negative relationship between a country's outward FDI and the export orientation of its entrepreneurs in that the former may 'crowd out' the latter (De Backer & Sleuwaegen, 2003). This 'crowding-out' effect could occur, for instance, if domestic MNEs are significantly more efficient than domestic entrepreneurs in the undertaking of export activities, and this difference in actual, or perceived, capability would then decrease domestic entrepreneurs' tendency to engage in export activities.

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However, we argue for a positive rather than negative spillover effect of outward FDI in that the crowding-out effect mentioned above may be outweighed by home-based MNEs' provision of various productive opportunities for domestic entrepreneurs. In essence, the rationale for the spillover effects from home-based MNEs to domestic entrepreneurs is to a great extent parallel to the argumentation provided above for foreign MNEs (Blomström & Kokko, 1998). From a conceptual basis, there is no reason to believe that the linkages between domestic entrepreneurs and foreign MNEs would yield different effects compared to the linkages with home-based MNEs. For instance, spillovers may occur if the home-based MNE adapts its products to local conditions abroad and if this adaptation is shared with the suppliers in the home country (Aitken et al., 1997). As such, home-based MNEs may give rise to market access spillovers to domestic entrepreneurs when the latter function as suppliers to the former in their home countries. Similarly, the spillovers obtained through the demonstration, training and competition effects, as outlined in the argumentation leading up to Hypothesis 1, may work in a similar way for home-based MNEs. For instance, the spillover effect from home-based MNEs with respect to training may play an important role, in that a manager of a foreign subsidiary may return to the home country for a new position in a local firm, or decide to use the gained international experience to become an (export-oriented) entrepreneur himself or herself (Cantwell & Hodson, 1991; Kogut & Chang, 1991).

An additional spillover effect stemming from home-based MNEs, which is not directly applicable to foreign MNEs, is that home-based MNEs' presence in foreign countries may familiarize foreign customers with common business practices in MNEs' home country, which may create then a pull effect to the home country's entrepreneurs to

engage in export activities (Nagel, 2003). Furthermore, the structural changes that take place in the entrepreneurs' home country when more home-based firms are multinational (i.e., when there is a higher level of outward FDI) may have a positive effect on entrepreneurs' export orientation. For instance, rather than producing finished goods for exports to foreign (and domestic) customers, home-based MNEs may be more likely to specialize in the production and exports of intermediates to their foreign affiliates (Blomström & Kokko, 1998). As a result, specific spillover effects to domestic entrepreneurs may occur as a consequence of this specialization. For instance, an increase in outward FDI may lead to an increasing emphasis in the home country on economic activities in advanced industries with higher productivity. This increased productivity, in turn, may force domestic entrepreneurs to increase the overall quality of their products, which may ultimately increase their chances to be successful in the international arena.

> *Hypothesis 2: A country's outward flow of FDI is positively related to the export orientation of its entrepreneurs.*

International trade and entrepreneurs' export orientation

In the previous hypotheses we posited that foreign direct investment, both inward and outward, presents an important source of knowledge spillovers through which export activity among a country's entrepreneurs may be stimulated. However, in this study we also consider how a country's international trade may affect the export orientation of its entrepreneurs. We extend hereby prior research that has argued for a link between international trade (i.e., export and import) and a country's productivity based on the transfer of knowledge across country borders (Findlay, 1984; Grossman & Helpman, 1991; Sjoholm, 1996). For instance, Findlay (1984) explained the importance of international trade for economic growth as international trade and in

particular the transfer of technology from more developed to less developed countries may significantly increase the economic growth of the latter countries. In the context of this study, we hypothesize that a country's level of export and import are two additional sources of knowledge spillovers that influence entrepreneurs' export behavior.

Export

First, we argue for a positive effect between a country's overall level of export and the export orientation of its entrepreneurs. One important channel through which this spillover may work is the earlier mentioned demonstration effect. That is, simple imitation may play an important role in shaping entrepreneurs' decision to export when being surrounded by many other firms that engage in export activities (Greenaway et al., 2004). The positive relationship between a country's export activity and entrepreneurs' export orientation is also in line with institutional theory which suggests that firm behavior may in many cases by explained by 'mimetic isomorphism,' i.e., the tendency by economic actors to imitate decisions or organizational practices by immediate peers (Powell & DiMaggio, 1991).

Another related reason for why spillovers stemming from existing export activity may be significant for entrepreneurs, especially for entrepreneurs with little international experience, is the complexity of the costs and benefits related to export activities (Johanson & Vahlne, 1990). As entrepreneurs come in contact with existing exporters, information about how to become a successful exporter can be diffused, and the uncertainty regarding the pros and cons of exporting may be diminished. For instance, when foreign customers provide information to their incumbent suppliers on how to facilitate the production of goods and services they plan to buy, this information may also reach a focal country's entrepreneurs through formal partnerships between the entrepreneur and exporting firms (e.g., strategic alliances) or

through more informal channels (e.g., trade associations, publications). Furthermore, the earlier mentioned training effect may also be relevant in this context in that individuals who have directly or indirectly been involved in exporting activities may be positively stimulated to enter foreign markets when setting up a new company themselves (McDougall et al., 1994).

A final mechanism that may explain the positive relationship between a country's overall level of export activity and entrepreneurs' export orientation is that existing relationships between domestic suppliers (i.e., who reside in the same country as the entrepreneur) and foreign customers may create a sense of familiarity among foreign customers vis-à-vis the entrepreneurs' country in general and its business practices in particular (Blomström & Kokko, 1998; Nagel, 2003). This familiarity may increase then the likelihood that entrepreneur can successfully export to foreign countries.

> *Hypothesis 3: A country's overall level of export is positively related to the export orientation of its entrepreneurs.*

Import

We also argue for a positive effect between a country's level of import activity and the export orientation of its entrepreneurs. A country's level of import activity reflects the amount of knowledge exchange that takes place between domestic producers and foreign suppliers. Prior research on the spillover effects stemming from import has mainly focused on the role of technology transfer, and there is indeed empirical evidence that imports present an important source for the transfer of new technologies across country borders (e.g., Blalock & Veloso, 2005; Feinberg & Majumdar, 2001; Glass & Saggi, 1998). We extend this research by arguing that spillover effects from imports may not only be related to technology transfer but also to international activities. An important way through which entrepreneurs may benefit from other

home-based firms' import activities is through a foreign producer's exchange of knowledge about its home market as a sales tool to its existing customers (Coe & Helpman, 1995). As this knowledge flow may spill over to a country's entrepreneurs through publications, formal or informal cooperation, or the decision of employees to set up their own firm, entrepreneurs may get a better understanding of the foreign producers' specific country context, and therefore be in a better position to find foreign customers in these countries.

In short, foreign producers may reveal information about their own country's unique characteristics as a sales tool to their existing customers, and indirectly, this knowledge may accumulate within the entrepreneurs' country. Over time, this accumulated knowledge about particular countries may decrease the uncertainty related to the undertaking of business activities in those foreign countries, and enhance entrepreneurs' tendency to engage in export activities.

Hypothesis 4: A country's overall level of import is positively related to the export orientation of its entrepreneurs.

Entrepreneurs' export orientation and total entrepreneurial activity

Finally, we also hypothesize that the export orientation of a country's entrepreneurs may generate *spillovers* that impact other individuals in their decision to start a new business, irrespective of the nature of this entrepreneurial activity. The basis for why some countries are characterized by higher *levels* of entrepreneurial activity has recently been summarized and synthesized in an eclectic approach of entrepreneurship (Noorderhaven et al., 2004; Verheul et al., 2002). This approach identifies supply and demand factors that are believed to shape economic actors' decision to launch a new business. While supply side factors of entrepreneurship (such as skills and preferences) pertain to conditions conducive to the presence of individuals who can act upon opportunities for new business creation, demand side factors

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(such as a country's industrial structure or its rate of economic growth) *create* the opportunities for such start-up activity.

We extend the above literature by arguing that the export orientation of a country's entrepreneurs may be an important impetus for a country's overall rate of (subsequent) entrepreneurial activity. More specifically, we argue that export-oriented entrepreneurs may be instrumental for the emergence of additional new companies within a country. First, the positive relationship between entrepreneurs' export orientation and the subsequent emergence of new businesses may result from exporting entrepreneurs' access to specific knowledge relating to foreign markets or technologies. This knowledge, in turn, may create opportunities for new business creation, either by employees leaving their current employer, or by the interactions that take place between the exporting entrepreneurs and other economic actors who are located in the same geographic area (Audretsch & Feldman, 1996). Furthermore, the spillover effect from export-oriented entrepreneurial activity to subsequent overall entrepreneurial activity can also be explained by the fact that export-oriented entrepreneurs may act as *extra-ordinary* role models for aspiring entrepreneurs (Davidsson & Honig, 2003). More specifically, and consistent with the premises underlying institutional theory, individual economic actors may have a tendency to imitate the behavior of highly visible and successful peers (i.e., export-oriented entrepreneurs) in that such imitation provides support and legitimacy in the market place (Powell & DiMaggio, 1991), and consequently, may become motivated to set up a new business themselves.

For the above reasons, entrepreneurs' export orientation may present an impetus for other economic actors to launch a new business, and at the macro-level, this export orientation may lead then to an increased emergence of new businesses within a country's borders.

Hypothesis 5: The export orientation of a country's entrepreneurs is positively related to its (subsequent) total level of entrepreneurial activity.

METHODOLOGY

Data and sample

The data for our study were drawn from various sources. First, data on a country's total level of entrepreneurial activity and export-oriented entrepreneurial activity (i.e., our dependent variables) were drawn from the Global Entrepreneurship Monitor (Reynolds et al., 2005). Data on a country's foreign direct investment were drawn from the Foreign Direct Investment database maintained by the United Nations Conference on Trade and Development (UNCTAD), and data on a country's export and import activity were drawn from the World Bank (i.e., our independent variables). Finally, we also included several control variables in our models, and the data for these controls were drawn from several data sources including the Global Competitiveness Report and the World Competitiveness Yearbook.

We collected annual data on 34 countries covering a four-year time period (2002-2005). The sample of countries was limited to those that had participated in the Global Entrepreneurship Monitor (GEM) in the 2002-2005 time frame.[2] Because not all countries participated in GEM in each single year, and because there were missing data for some of the independent variables, our analyses were based on an unbalanced panel dataset including 78 observations distributed over 34 countries. The use of an unbalanced panel in estimating country-level entrepreneurship is consistent with the approach used by van Stel and Carree (2004).

Measures

Dependent variables

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[2] The countries are Argentina, Australia, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Norway, Poland, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, and United States.

Total level of entrepreneurial activity (2002-2005) was measured by using GEM's *TEA index*[3] which assesses the proportion of a country's population between the ages of 18 and 64 who are either in the start-up phase or are managing/owning a business that is less than 42 months old.[4] The TEA index thus assesses, in a given year, the total *level* of (early-stage) entrepreneurial activity within a country, irrespective of the nature of this activity. Reynolds et al. (2005) provided empirical support for the *validity* of the TEA index by comparing it with national administrative data on firm birth rates, and also provided evidence of the *reliability* of the index by calculating the correlation of countries' TEA rates over different years.

Export orientation of a country's entrepreneurs (2002-2005) was measured as the percentage of a country's (early-stage) entrepreneurs (as defined by the TEA index) who are involved in substantial export activity. More specifically, we assessed the *proportion* of entrepreneurs, relative to the total number of entrepreneurs, who stated that at least 26% of their customers were located in a foreign country.

Independent variables

Inward FDI (2001-2004) was measured as the percentage of a country's inward flow of foreign capital relative to its gross fixed capital formation. This measure was drawn from UNCTAD's World Investment Report.

Outward FDI (2001-2004) was measured as the percentage of a country's outward flow of capital relative to its gross fixed capital formation. This measure was also drawn from UNCTAD's World Investment Report.

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[3] The TEA (Total early-stage Entrepreneurial Activity) index is the most widely known index generated by the GEM project (Minniti et al., 2006; Reynolds et al., 2005).

[4] Individuals engaged in both activities in a given year were counted only once (Reynolds et al., 2005).

Export (2001-2004) was measured as the percentage of a country's exports of goods and services relative to its gross domestic product. This measure was drawn from the World Development Indicators database, provided by the World Bank.

Import (2001-2004) was measured as the percentage of a country's imports of goods and services relative to its gross domestic product. This measure was also drawn from the World Development Indicators database, provided by the World Bank.

Control variables

In order to control for alternative explanations for the variation of our dependent variables across countries, we included several control variables in our models. Consistent with the eclectic framework of entrepreneurship (Noorderhaven et al., 2004; Verheul et al., 2002), we classified these controls into two categories, i.e., a category including demand side factors reflecting the presence of entrepreneurial opportunities through market demand, and a category including supply side factors, reflecting the skills and preferences of a country's population vis-a-vis entrepreneurship.

Demand side factors

Employment share in agriculture (2000) reflects a country's economic structure, which may have an effect on the level and nature of a country's entrepreneurial activity (Verheul et al., 2002). This measure was drawn from the World Competitiveness Yearbook.

Poor country dummy (2000) reflects the extent to which a country's overall prosperity may influence its start-up activities (Verheul et al., 2002), and was coded as '1' when the per capita income in 2000 exceeded $15,000 US in Purchasing Power Parity, and as '0' otherwise. This measure was also drawn from the World Competitiveness Yearbook.

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Economic growth (2001-2004) assesses the annual percentage change in a country's gross domestic product, and reflects a dynamic aspect of a country's overall prosperity. This measure was drawn from the World Economic Outlook database, provided by the International Monetary Fund.

FDI and technology transfer (2001) assesses (on a seven-point Likert scale) the extent to which inward FDI is an important source of new technology for the host country, and reflects an alternative role of FDI in addition to the hypothesized 'export spillover' effect. This measure was drawn from the Global Competitiveness Report.

Company-university cooperation (2001) assesses (on a seven-point Likert scale) the technology transfer between companies and universities, and reflects an additional source of technological resources for entrepreneurs. This measure was drawn from the World Competitiveness Yearbook.

Supply side factors

Ease of access to loans (2001) (measured on a seven-point Likert scale) reflects the extent to which (potential) entrepreneurs have easy access to financial resources to support their activities. This measure was drawn from the Global Competitiveness Report.

Tertiary education (1997) assesses a country's gross tertiary enrollment rate. This measure was also drawn from the Global Competitiveness Report.

Working hours (2000) assesses the average working hours per year, and reflects the potential supply of (growth-oriented) entrepreneurs within a country. In countries where the practice of working long hours is more common, there may be a higher supply of entrepreneurs because entrepreneurs, on average, also make long working days. This measure was drawn from the World Competitiveness Yearbook.

The eight controls described above were used for the estimation of the export orientation of a country's entrepreneurs as well as a country's total level of entrepreneurial activity. Furthermore, for the estimation of the former variable, we also included two additional control variables:

Gross Domestic Product (logarithm) (2001-2004) reflects the size of a country's home market, and may influence entrepreneurs' export orientation. This measure was drawn from the World Development Indicators database, provided by the World Bank.

Time required to meet export regulations (2002) reflects a specific constraint pertaining to entrepreneurs' decision to engage in export-oriented activities, and was measured as the number of days needed to meet all procedural requirements for exporting a 'standardized cargo of goods.' This measure was drawn from the World Bank Doing Business database.

Analysis

Before we explain how we tested our hypotheses, we would like to note that in order to avoid reverse causality in our analyses, we used a one-year time lag for the four 'internationalization variables' (i.e., inward FDI, outward FDI, export, and import) when estimating entrepreneurs' export orientation, and, similarly, we used a one-year time lag for entrepreneurs' export orientation when estimating a country's total level of entrepreneurial activity. Furthermore, most control variables (except for economic growth and log of GDP) were included as time-invariant variables in the analysis as these variables were assumed to change only slowly over time.

In order to get an initial idea about how our variables were related to one another, we first calculated a correlation matrix (Table 1). Next, we included our control variables in a model estimating the export orientation of a country's entrepreneurs (measured as the percentage of

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total entrepreneurs involved in substantial export activity). In order to avoid omitted variable bias, we first included all relevant control variables (Table 2, Model I). Next, we applied a 'general-to-specific' modeling procedure, in which the control variables with the smallest t-statistic were removed in subsequent model re-estimations, until a set of significant control variables significant at $p < .10$ were retained (Table 2, Model II; see also Bleany & Nishiyama, 2002).[5]

Once we had selected an 'optimal' set of controls, we tested Hypotheses 1 to 4 by including the four independent variables in four separate models estimating entrepreneurs' export orientation (Table 2, Models III to VI).[6] The hypotheses were tested by using likelihood ratio tests. Furthermore, in order to test which of the four independent variables (i.e., inward FDI, outward FDI, export, or import) had the strongest impact on entrepreneurs' export orientation, we ran several models in which different combinations of 'independent variables' were included (Table 3, Models I to IV).

In order to test Hypothesis 5, we estimated the effect of entrepreneurs' export orientation on a country's total level of entrepreneurial activity after taking into account the effect of several control variables.[7] In order to select an appropriate set of control variables, we again used the 'general-to-specific' modeling procedure as described above.[8] The results of this procedure are

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[5] As an additional test, we re-entered the eliminated control variables, separately, to the selected model in order to check whether some variables had been erroneously eliminated during the statistical procedure outlined above (possibly due to multicollinearity). This proved not to be the case.

[6] The reason for the inclusion of our independent variables in separate models is related to possible multicollinearity issues. For instance, the correlation coefficient between a country's export and import was found to be 0.98 (Table 1).

[7] Given the one-year time lag used between entrepreneurs' export orientation and their country's total level of entrepreneurial activity, the number of observations in Table 4 (and Table 5) was reduced from N=78 to N=63.

[8] It should be noted that the dependent variable in Table 4 (and Table 5) is different from the one used in Tables 1 to 3.

presented by Models I and II in Table 4. Hypothesis 5 was tested in Models III and IV in Table 4.

Finally, we also undertook supplementary analyses in order to check whether entrepreneurs' exportation *mediated* the relationship between the independent variables (FDI, export, and import) on the one hand, and a country's total level of entrepreneurial activity on the other (Table 5). We employed the three-step method as suggested by Baron and Kenny (1986) to test for mediating effects. In a first step, we estimated the effect of an independent variable on entrepreneurs' export orientation (this step was already included in Table 2, Models III to VI, and was therefore not repeated in Table 5). In a second step, we estimated the effect of each independent variable on a country's total level of entrepreneurial activity (Table 5, Models I, III, and V). In a third step, we estimated the combined effect of an independent variable and entrepreneurs' export orientation (i.e., the mediation variable) on a country's total level of entrepreneurial activity (Table 5, Models II, IV, and VI). In the case that an independent variable has a significant effect in the first and second step, *and* its effect disappears (or diminishes) in the third step (i.e., after entrepreneurs' export orientation is added to the model), support is found for a mediating effect.[9]

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[9] We note that all models in Table 5 (as well as Models III and IV in Table 4) were estimated based on an 'instrumental variable estimation' rather than OLS procedure. This is because the variable pertaining to 'entrepreneurs' export orientation' is endogenous when estimating a country's total level of entrepreneurial activity. More specifically, there is a strong theoretical basis for expecting an influence of GDP on entrepreneurs' export orientation, as this control variable measures the size of the entrepreneurs' home market. Therefore, we used an instrumental variable estimation (IV) where (the log of) GDP was used as an instrument. In a similar fashion, the 'international variables' used in this study may also be dependent on GDP. In order for the statistical models to be specified, at least two instrumental variables were necessary. Therefore, in addition to GDP, a country's 'stock of inward FDI' was also used as an instrumental variable. For consistency we used the same two variables as instruments across all models that needed an 'instrumental variable' (IV) estimation. It should be noted that GDP is not only a suitable instrument from a theoretical point of view but also from a statistical point of view. More specifically, as can be seen from Table 1, GDP is not significantly correlated with 'total level of entrepreneurial activity' but it is significantly correlated with 'entrepreneurs' export orientation' as well as with 'export' and 'import' (the endogenous explanatory variables in Tables 4 and 5). A similar reasoning can be given for the use of inward FDI stock as an instrumental variable.

RESULTS

From Table 1, it can be seen that the correlations between the entrepreneurs' export orientation and the four (lagged) internationalization variables (inward FDI, outward FDI, export, and import) are significant and positive, providing preliminary evidence for our hypothesized spillover effects with respect to export orientation (Hypotheses 1 to 4). However, we found no significant correlation between entrepreneurs' export orientation and a country's (subsequent) total level of entrepreneurial activity (Hypothesis 5).

From Table 2 (Model II), it can be seen that three controls were withheld for the estimation of entrepreneurs' export orientation, i.e., employment share in agriculture, ease of access to loans, and gross domestic product (log). When the four internationalization variables were added to the model (Table 2, Models III to VI), support was found for three of the four corresponding hypotheses. More specifically, we found that entrepreneurs' export orientation is positively influenced by a country's outward FDI ($p < .05$; Hypothesis 2 supported), level of export ($p < .01$; Hypothesis 3 strongly supported), and level of import ($p < .01$; Hypothesis 4 strongly supported). However, no support was found for a relationship between a country's inward FDI and entrepreneurs' export orientation (i.e., Hypothesis 1 not supported).

In Table 3 we estimated entrepreneurs' export orientation by using different combinations of the three internationalization variables that were found significant in Table 2. It can be seen that due to multi-collinearity the individual effect of outward FDI, export and import disappeared when the three variables were simultaneously included in one model (Table 3, Model I). A comparison of the results across Models II to IV (Table 3) shows that import has the strongest impact on entrepreneurs' export orientation, followed by export, and outward FDI.

From Table 4 (Model II), it can be seen that the following control variables were withheld for the estimation of a country's total level of entrepreneurial activity: employment share in agriculture, poor country dummy, ease of access to loans, tertiary education, and working hours. Furthermore, from Table 4 (Model III) we found that entrepreneurs' export orientation is (marginally) positively related to a country's total entrepreneurial activity ($p < .10$). When the two non-significant control variables in Model III (i.e., ease of access to loans, and working hours) were removed in Model IV, the effect of entrepreneurs' export orientation became stronger ($p < .05$).[10] Overall, our findings support Hypothesis 5.

Finally, Table 5 shows our assessment of the possible mediation effect of entrepreneurs' export orientation between a country's outward FDI, export and import on the one hand, and its total level of entrepreneurial activity on the other. It should be noted that we did not test for a mediation effect with respect to inward FDI since we had not found a significant effect for inward FDI on entrepreneurs' export orientation (Table 2, Model III). Our results suggest that entrepreneurs' export orientation mediates the relationship between a country's export and import on the one hand, and its total level of entrepreneurial activity on the other, as the (marginal) effect of export and import on a country's total level of entrepreneurial activity (Table 5, Models III and V respectively) disappeared after entrepreneurs' export orientation was added to the model (Table 5, Models IV and VI respectively).

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[10] The rationale for why 'ease of access to loans' and 'working hours' were omitted in Model IV is that the weak effect of 'export orientation' in Model III may have been caused by multi-collinearity It should be noted that the correlations between 'ease of access to loans' on the one hand, and 'entrepreneurs' export orientation' and 'working hours' on the other were indeed quite strong (Table 1).

Insert Tables 4 and 5 about here

DISCUSSION

The literature suggests that firms' entry into foreign markets can be very difficult, especially for early-stage companies that lack the resources necessary for international entry (Johanson & Vahlne, 1990). For instance, new businesses that enter the international area early on in their existence may lack first-hand information about foreign tastes and distribution channels (Autio et al., 2000; Eriksson et al., 1997). We relied on the economics literature to argue that cross-country differences with respect to entrepreneurs' export orientation may be explained by the extent to which entrepreneurs are exposed to other economic actors' international activities (Grosmann & Helpman, 1991). More specifically, we examined four sources of spillovers potentially influencing the export orientation of a country's entrepreneurs, i.e., the country's level of foreign direct investment, both in terms of inward and outward FDI, and its international trade (i.e., export and import). As such, our study contributed to the entrepreneurship literature by taking into account macro-level factors in explaining entrepreneurs' export orientation. We also contributed to the economics literature by examining the impact of inward FDI as well as other sources of spillovers (outward FDI and international trade) on one particular type of a country's economic actors, i.e., its entrepreneurs. Finally, we extended the economics literature on entrepreneurship by investigating one particular type of 'entrepreneurship spillovers,' i.e., we examined the extent to which export-oriented entrepreneurs may create spillovers that positively contribute to the overall emergence of new businesses within a country's borders.

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Overall, we found support for the presence of spillover effects from three different sources. More specifically, we found that a country's outward FDI, export and import positively influence entrepreneurs' export orientation. However, contrary to our expectations, we found no spillover effect from inward FDI. Finally, we also found empirical support for the spillover effect from export-oriented entrepreneurship to a country's overall level of entrepreneurial activity. Below we discuss our findings in more detail.

Inward FDI and entrepreneurs' export orientation

Contrary to our expectations we did not find evidence for a positive influence of a country's inward FDI on the export orientation of its entrepreneurs. This finding is revealing in that the economics literature has to an important extent focused on the role of foreign MNEs in creating economic prosperity within host countries (e.g., Barrell & Pain, 1997) or increasing domestic firms' propensity to export (Aitken et al., 1997; Greenaway et al., 2004). However, this source of spillover does not appear to affect the export orientation of a host country's *entrepreneurs*. One possible explanation for the lack of result may be that the channels for knowledge spillovers stemming from inward FDI may be more relevant for incumbent economic players compared to recently created firms. For instance, foreign MNEs may be more likely to establish commercial linkages with local players that have gained a certain reputation in the host country rather than with novices that lack legitimacy (Podolny, 1993). Alternatively, early-stage companies, compared to their more established counterparts, may have a limited capacity to absorb the knowledge provided by their linkages with foreign MNEs (Cohen & Levinthal, 1990), and therefore may be less likely to benefit from their co-operation with foreign MNEs. We acknowledge, however, that these explanations are somewhat speculative; future research should therefore assess in more detail the intermediate mechanisms through which entrepreneurs may,

or may not, benefit from inward FDI, and how these mechanisms may be different for early-stage compared to more mature companies.

Outward FDI and entrepreneurs' export orientation

Our finding of the positive influence of a country's outward FDI on the export orientation of its entrepreneurs is revealing in the light of the argument, upheld by some researchers, that outward FDI may *negatively* affect a country's economic prosperity because of the transfer of local production and employment to foreign countries (e.g., Jones, 1996). Our study suggests an indirect positive impact of outward FDI on a home country's economic activity in that outward FDI was found to spur entrepreneurs' involvement in export-oriented activities. One possible explanation for this positive spillover, as we had hypothesized, is that the presence of home-based MNEs in foreign markets may create a pull effect from foreign customers to the MNEs' home market (Nagel, 2003), from which domestic entrepreneurs in turn may then benefit. Overall, our results with regard to the positive effect of outward FDI are in line with prior research that highlighted the role of outward FDI in providing technological feedback to the home country (Dunning, 1993), and with empirical results on the positive spillover effects from outward FDI to domestic firms (Blomström & Kokko, 1998; Popovici, 2005).

International trade and entrepreneurs' export orientation

Interestingly, we found that the spillover effects on entrepreneurs' export orientation were strongest when resulting from international trade (export and import) rather than foreign direct investment. One reason for this finding may be that entrepreneurs' decisions are to an important extent driven by the behavior of other 'similar' firms. That is, consistent with the premises underlying institutional theory (Powell & DiMaggio, 1991), economic actors may have an inclination to imitate the behavior and practices of others with whom they can more directly

relate. While we had argued that the channels through which export spillovers occur may work in similar ways when stemming from foreign direct investment versus international trade (e.g., with respect to the role of commercial linkages), it may be that entrepreneurs consider foreign (and even home-based) MNEs as 'more distant' economic players, and that their decisions with respect to their involvement in export activities are more strongly driven by others' 'less complex' international trade activities rather than 'more complex' FDI activities (Powell & DiMaggio, 1991).

In this regard, it is interesting that a country's level of import was found to have the strongest spillover effect on entrepreneurs' export orientation. Prior research has found that, at the firm level, there is a close connection between firms' import and export activities, as both activities are often combined (Fletcher, 2001) and import may be an important determinant of export activity (Lefebvre & Lefebvre, 2002). An explanation for this connection is that the hurdle to engage in exporting may become significantly lower when a company has already established business contacts in foreign countries through import. Our findings suggest that such connection may also exist at the country-level, and may actually spillover *across* firms. More specifically, the knowledge gained by the import activities undertaken by a country's incumbent economic players may in important ways spill over to other economic actors, including entrepreneurs with international ambitions.

Entrepreneurs' export orientation and total entrepreneurial activity

In terms of the effect of entrepreneurs' export orientation on the subsequent emergence of new companies within a country's borders, we found that people may be more inclined to set up their own firm when they are exposed to export-oriented entrepreneurs. This result suggests that export-oriented entrepreneurs may act as (successful) role models for aspiring entrepreneurs, and

thus function as catalysts for others to start their own firm. We were thus able to identify a particular type of 'entrepreneurship spillovers,' i.e., spillovers that stem from export-oriented entrepreneurship (Parker, 2005). Furthermore, our findings also extend prior research that has sought to understand the determinants of a country's level of entrepreneurship or start-up activity (e.g., Gavron et al., 1998; Noorderhaven et al., 2004; Storey, 1999; Thurik & Wennekers, 2004; van Stel et al., 2005; Verheul et al., 2002). More specifically, our study is one of the first, we believe, to examine the link between a country's *level* and *type* of entrepreneurial activity. The type of entrepreneurial activity chosen by entrepreneurs is clearly important for the effect that such activity may have on an economy (Baumol, 1990). For instance, prior research has found empirical evidence for a positive link between export activity and productivity, in that the productivity of exporting firms have been found to be higher than for non-exporting firms (Castellani, 2002; Girma et al., 2004). Our study suggests then that one important mechanism through which entrepreneurs' export activities may affect a country's economic prosperity is through the positive spillover effect on other economic actors' decision to launch a new business. Furthermore, our results pertaining to the mediation effect of entrepreneurs' export orientation suggest that the emergence of new businesses within a country is indirectly influenced by its level of international trade (export and import) *through* its (early-stage) entrepreneurs' decision to engage in substantial exporting activity.

Limitations and future research

While we believe that our study provides important insights into the question of what determines the export orientation of a country's entrepreneurs (and its overall level of entrepreneurial activity), we are aware that the study contains several limitations. These limitations, in turn, open avenues for further research.

First, we realize that we focused on only one particular aspect of 'productive' activity among a country's entrepreneurs (Baumol, 1990), i.e., the extent to which they engage in substantial export activity. Although export has been pointed out as being an important dimension of entrepreneurs' international activities (e.g., Burpitt & Rondinelli, 2000; Johanson & Vahlne, 1990), it would also be interesting to examine knowledge spillover effects on other facets of entrepreneurs' early involvement in foreign markets, such as foreign licensing, franchising, or even foreign direct investment (Eriksson et al., 1997). Furthermore, given the vast body of research on the impact of technology spillovers on economic growth (e.g., Blalock & Veloso, 2005; Feinberg & Majumdar, 2001; Glass & Saggi, 1998), future research should seek to include alternative dimensions of productive activities among a country's entrepreneurs, such as their level of innovation. Such an approach would provide a more encompassing view of how countries' exposure to internationalization influences entrepreneurs' potential contribution to economic prosperity.

Second, as our panel dataset covered a period of only four years, our analyses were largely static. Clearly, future research would greatly benefit from longitudinal data spanning a longer period of time as this would permit to incorporate dynamic elements into the hypothesized relationships. For instance, an interesting question is how changes *within* countries across time in terms of their involvement in FDI and international trade affect the nature of entrepreneurial activities that take place within country borders. Similarly, future research would benefit from using time-lags greater than one year when examining the

spillover effect of entrepreneurs' export orientation on future entrepreneurial activity, as such spillovers – e.g., through role modeling – may take significant time before they materialize.[11]

Third, in the theory and hypotheses sections of the paper, we discussed several channels through which spillovers may occur for entrepreneurs who aspire to engage in export activities (e.g., their commercial linkages or prior employment with foreign firms). However, a limitation of this study is that we did not empirically measure these channels. Although the intangible nature of export spillovers may make it hard to empirically assess the channels through which these spillovers operate, future research should provide more insight into the different effects that are generated by various types of spillover channels. Also, it is possible that the importance of different spillover channels is contingent upon the specific source of the spillovers (e.g., FDI versus international trade). For instance, prior research has found that in the case of inward FDI, an increased competition in the host country may represent the main channel through which local firms' involvement in export activities is stimulated (Greenaway et al., 2004).

Fourth, as we focused on aggregate country-level spillover effects on entrepreneurs' export orientation we may have omitted important industry-level effects. In fact, the literature on technology spillovers has traditionally focused on spillover effects that take place at the industry rather than country level (e.g., Bernstein & Nadiri, 1988; Cohen & Klepper, 1996). [12] Similarly, it is possible that, in the context of our study, entrepreneurs' decisions to engage in export activities depend to an important extent on the knowledge flow from other companies that are active in the *same* sector of the economy. By ignoring industry-specific factors, we implicitly assumed that the

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[11] The one-year time lag between entrepreneurs' export orientation and a country's total level of entrepreneurial activity, in our analyses, may explain the relative weak relationship between these two variables in Tables 4 and 5.

[12] In fact, there is a large body of research that has examined whether spillovers *within* versus *between* industries are more effective for economic growth (e.g., Frenken et al., 2006; Glaeser et al., 1992; Jacobs, 1969; van Stel and Nieuwenhuijsen, 2004)

mechanisms through which export spillovers work for entrepreneurs are identical across industries. Future research could examine whether this assumption indeed holds true, and to what extent the strength of spillover effects with respect to export practices may be dependent on important industry characteristics such as the industry's maturity level or level of competition. Furthermore, future research could also compare the effect of 'horizontal' spillovers (i.e., spillovers across industries) and 'vertical' spillovers (i.e., spillovers between suppliers and buyers) on entrepreneurs' export decisions.

Implications

Our study also holds some practical implications. First, our findings suggest that entrepreneurs whose ambitions are to become an important player in the international arena may benefit from locating themselves in areas where other international players are concentrated. Similarly, from a country perspective, governments that wish to encourage export activities among their entrepreneurs may benefit from creating geographical zones which are specifically reserved for exporting firms (Din, 1994). Our findings implicitly indicate that such zones may help reduce entrepreneurs' costs of breaking into foreign markets.

Second, governments have traditionally focused on stimulating export activity among their domestic firms and attracting inward FDI in order to generate economic growth (Ghauri & Oxelheim, 2003; Molnar, 2003). Also, when national instruments for promoting imports and outward FDI *do* exist, these instruments tend to be part of the development policy of only poorer or less developed countries (Hessels & Prince, 2005). The results of our study suggest, however, that, irrespective of a country's level of development, home economies may benefit if their governments also focus on the promotion of import activity and outward FDI. That is, an increased level of international trade (both export and import) as well as an increased level of

outward FDI may stimulate entrepreneurs' involvement in export activities, and this may ultimately foster economic prosperity. Governments should therefore further reduce existing trade and investment barriers, and create specific support measures for the promotion of outward FDI, export and import activities.

Conclusion

We examined the role played by a country's foreign direct investment and international trade as sources of spillover effects for entrepreneurs' export decisions, and subsequently as a means to spur a country's total level of entrepreneurial activity. Our study highlighted that entrepreneurs' export orientation may indeed function as a catalyst for the emergence of new businesses within a country's borders, and that such export orientation by itself is influenced by a country's levels of outward FDI, export and import. As such, we showed that the economics literature, and the literature on spillovers in particular, is a useful lens in studying macro-level antecedents and outcomes of entrepreneurs' involvement in international activities. We hope then that this study can serve as a stepping-stone to further investigate the fundamental mechanisms by which a country's posture vis-à-vis international activity may affect the nature and outcomes of entrepreneurs' undertakings.

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Table 1: Correlation matrix (N=78)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Total level of entrepreneurial activity (TEA)																
2. Entrepreneurs' export orientation	-.25[a] (N=63)															
3. Inward FDI flow (year t-1)	-.16	.29 *														
4. Outward FDI flow (year t-1)	-.35 **	.45 **	.58 **													
5. Export of goods and services (year t-1)	-.29 **	.59 **	.60 **	.46 **												
6. Import of goods and services (year t-1)	-.30 **	.59 **	.57 **	.45 **	.98 **											
7. Employment share in agriculture	.59 **	-.48 **	-.17	-.34 **	-.22 *	-.21										
8. Poor country dummy	.53 **	-.41 **	-.096	-.45 **	-.25 *	-.25 *	.63 **									
9. Economic growth	.22	-.068	.00	-.19	.14	.14	.41 **	.23 *								
10. FDI and technology transfer	.16	-.018	.45 **	.17	.29 **	.31 **	.068	.31 **	.088							
11. Company-university cooperation	-.17	.31 **	.24 *	.37 **	.15	.13	-.45 **	-.50 **	-.18	-.083						
12. Ease of access to loans	-.35 **	.40 **	.22	.53 **	.22	.18	-.55 **	-.68 **	-.31 **	-.14	.76 **					
13. Tertiary education	-.20	.23 *	-.050	.26 *	-.09	-.11	-.59 **	-.70 **	-.21	-.24 *	.57 **	.59 **				
14. Working hours	.43 **	-.009	-.010	-.29 **	.22	.26 *	.35 **	.52 **	.27 *	.15	-.34 **	-.56 **	-.52 **			
15. Log of GDP	-.16	-.46 **	-.19	-.016	-.33 **	-.33 **	.08	-.063	-.071	-.039	-.031	.019	.16	-.28 *		
16. Time to meet export regulations	.37 **	-.29 *	-.16	-.38 **	-.25 *	-.23 *	.49 **	.69 **	.16	.18	-.55 **	-.61 **	-.64 **	.40 **	-.097	
Mean	7.9	16.5	17.4	12.1	40.9	38.2	10.1	0.28	2.8	5.1	4.4	3.8	42.8	1,881	12.8	16.2
Standard deviation	4.2	9.6	16.7	15.1	29.4	27.5	12.7	0.45	2.9	0.5	1.4	0.9	20.1	153	1.5	9.3

* $p < .05$; ** $p < .01$.

[a] The indicated correlation refers to the lagged value of entrepreneurs' export orientation compared to a country's total level of entrepreneurial activity, consistent with our analyses in Tables 4 and 5.

Table 2: Estimation of the export orientation of a country's entrepreneurs (N=78)

	Model I	Model II	Model III	Model IV	Model V	Model VI
Constant	14.6	46.2 **	44.3 **	49.1 **	32.8 **	31.7 **
	(0.7)	(6.0)	(5.7)	(6.4)	(4.3)	(4.2)
Employment share in agriculture	-.23 *	-.24 **	-.24 **	-.22 **	-.21 **	-.20 **
	(2.1)	(3.8)	(3.8)	(3.8)	(4.0)	(4.0)
Poor country dummy	-5.5					
	(1.5)					
Economic growth	.34					
	(1.1)					
FDI and technology transfer	.87					
	(0.5)					
Company-university cooperation	-.51					
	(0.6)					
Ease of access to loans	3.3 *	2.4 *	2.2 *	.94	1.7 #	2.0 *
	(2.2)	(2.5)	(2.3)	(0.8)	(1.9)	(2.2)
Tertiary education	-.039					
	(0.6)					
Working hours	.013 #					
	(1.7)					
Log of GDP	-2.5 **	-2.9 **	-2.7 **	-2.8 **	-2.0 **	-2.0 **
	(4.2)	(5.5)	(5.4)	(5.6)	(4.3)	(4.3)
Time required to meet export regulations	-.006					
	(0.1)					
H1: Inward FDI flow (year t-1)			**.059**			
			(0.9)			
H2: Outward FDI flow (year t-1)				**.19 ***		
				(2.4)		
H3: Export of goods and services (year t-1)					**.13 ***	
					(3.8)	
H4: Import of goods and services (year t-1)						**.14 ***
						(3.9)
R^2	.508	.450	.460	.512	.577	.589
Adjusted R^2	.435	.428	.430	.486	.554	.566
Loglikelihood	-258.9	-263.2	-262.5	-258.5	-253.0	-251.9

Dependent variable: Number of (early-stage) entrepreneurs stating that 26% or more of their customers are foreign, as % of total (early-stage) entrepreneurs. Estimation method is OLS.

Absolute heteroskedasticity consistent t-values are shown in parentheses.

# $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 3: Estimation of the export orientation of a country's entrepreneurs: Combined models (N=78)

	Model I	Model II	Model III	Model IV
Constant	34.5 **	36.1 **	34.7 **	31.4 **
	(4.6)	(4.7)	(4.6)	(4.2)
Employment share in agriculture	-.20 **	-.21 **	-.20 **	-.20 **
	(3.9)	(3.9)	(3.9)	(4.0)
Ease of access to loans	1.6	1.1	1.4	2.2 *
	(1.6)	(1.1)	(1.4)	(2.4)
Log of GDP	-2.2 **	-2.1 **	-2.1 **	-2.1 **
	(4.4)	(4.6)	(4.5)	(4.2)
Outward FDI flow (year t-1)	**.078**	**.089**	**.079**	
	(1.1)	**(1.3)**	**(1.1)**	
Export of goods and services (year t-1)	**-.097**	**.11 ****		**-.10**
	(0.8)	**(3.4)**		**(0.8)**
Import of goods and services (year t-1)	**.22**		**.12 ****	**.25 #**
	(1.6)		**(3.4)**	**(1.9)**
R^2	.600	.589	.598	.591
Adjusted R^2	.566	.560	.570	.563
Loglikelihood	-250.8	-251.9	-251.0	-251.6

Dependent variable: Number of (early-stage) entrepreneurs stating that 26% or more of their customers are foreign, as % of total (early-stage) entrepreneurs. Estimation method is OLS.

Absolute heteroskedasticity consistent t-values are shown in parentheses.

# $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 4: Estimation of a country's total level of entrepreneurial activity (N=63)

	Model I	Model II	Model III	Model IV
Constant	-25.1 **	-22.3 **	-18.6 *	-9.1 *
	(3.8)	(4.0)	(2.3)	(2.3)
Employment share in agriculture	.20 **	.19 **	.24 **	.25 **
	(5.2)	(5.1)	(3.8)	(3.5)
Poor country dummy	5.5 **	5.8 **	6.8 **	7.2 **
	(4.1)	(4.7)	(3.5)	(3.5)
Economic growth	-.12			
	(0.5)			
FDI and technology transfer	.68			
	(1.0)			
Company-university cooperation	.13			
	(0.4)			
Ease of access to loans	.86	1.21 *	.63	
	(1.4)	(2.3)	(0.8)	
Tertiary education	.12 **	.12 **	.16 **	.17 **
	(3.7)	(4.3)	(3.9)	(3.8)
Working hours	.0093 **	.0090 **	.0048	
	(3.6)	(3.8)	(1.2)	
H5: Entrepreneurs' export orientation (year t-1)			**.22 #**	**.30 ***
			(1.7)	**(2.5)**
Estimation method	OLS	OLS	IV	IV
Endogenous explanatory variables			Entrepreneurs' export orientation	Entrepreneurs' export orientation
Instruments used			Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock
R^2	.630	.620	.379	.270
Adjusted R^2	.575	.587	.312	.219

Dependent variable: Number of (early-stage) entrepreneurs as % of adult population (i.e., TEA index).

Absolute heteroskedasticity consistent t-values are shown in parentheses.

# $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

Table 5: Estimation of a country's total level of entrepreneurial activity: Testing for mediating effects (N=63)

	Model I	Model II	Model III	Model IV	Model V	Model VI
Constant	.27	-8.8 #	-1.5	-10.9 **	-1.6	-10.7 **
	(0.1)	(1.9)	(0.7)	(2.0)	(0.7)	(2.0)
Employment share in agriculture	.17 **	.26 **	.19 **	.27 **	.19 **	.27 **
	(4.5)	(2.9)	(4.8)	(2.7)	(4.8)	(2.7)
Poor country dummy	5.7 **	5.6 #	6.3 **	6.7 **	6.5 **	6.5 *
	(3.0)	(1.8)	(4.1)	(2.4)	(4.1)	(2.3)
Tertiary education	.10 **	.17 **	.12 **	.17 **	.12 **	.17 **
	(3.5)	(3.3)	(3.7)	(3.1)	(3.7)	(3.0)
Outward FDI flow	**.0071**	**-.12**				
(year t-1)	**(0.1)**	**(0.9)**				
Export of goods and services (year t-1)			**.020 #**	**-.039**		
			(1.7)	**(0.9)**		
Import of goods and services (year t-1)					**.022 #**	**-.042**
					(1.7)	**(0.9)**
Export orientation of entrepreneurs (year t-1)		**.38 ***		**.48 #**		**.47 #**
		(2.1)		**(1.8)**		**(1.8)**
Estimation method	IV	IV	IV	IV	IV	IV
Endogenous explanatory variables	Outward FDI flow,	Outward FDI flow, Export orientation	Export	Export, Export orientation	Import	Import, Export orientation
Instruments used	Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock	Log of GDP; Inward FDI stock
R^2	.531	.189	.516	.168	.518	.169
Adjusted R^2	.499	.118	.483	.095	.484	.097

Dependent variable: Number of (early-stage) entrepreneurs as % of adult population (i.e., TEA index).

Absolute heteroskedasticity consistent t-values are show in parentheses.

 # $p<0.10$; * $p<0.05$; ** $p<0.01$.

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