POLITECNICO DI TORINO

Doctoral Program in Management, Production and Design

Ciclo XXVI

Internationalization models: an empirical analysis of the new paradigms for innovative high tech new ventures

Tesi di Dottorato di Giusy Cannone

Coordinatore: Prof. Mario Calderini

Anno Accademico 2013

ABSTRACT

Entrepreneurship is a phenomenon of tremendous social importance. In recent years, policy makers across several and diverse countries have realized and recognized the transversal importance of entrepreneurship as engine for the economic growth or recovery.

Today, the increased openness of economies, the emergence of global players, the firms' need for new sources of competitiveness and the technological advances in telecommunications, information and transportation have driven entrepreneurial new ventures to increasingly exploit different geographical areas as a strategic asset in their decision making process regarding the organization of resources; all the mentioned technology-enabling factors indeed allow entrepreneurs to consider, select and compete for resources (i.e. human, finance, technology, infrastructure etc.) on a global scale and since the early stages of their enterprise life.

This posits new challenges for policy makers which cannot limit their efforts to facilitate the establishment of new domestic ventures; they are indeed themselves competing on a global arena to attract the best entrepreneurs and the most potential high growth new ventures from around the world.

The thesis has a twofold goal. First it aims at investigating why an entrepreneur chooses to approach internationalization since the inception of his/her enterprise, namely what drives the emergence of the so called *born globals*, through an integration of explanations situated at different levels of analysis such as the entrepreneur, the firm, the home country etc.; results show that the presence of a small domestic market, the scalability of the business and a niche approach have a positive effect on the the early internationalization. In addition, the network relationships built by the entrepreneur, his/her entrepreneurial orientation, international commitment and experiential knowledge seem to be key drivers for early internationalization. The second goal is to explore where the early internationalization process takes place, constituting an empirical attempt to explain the relationship between internationalization patterns of start-ups and the attractiveness of host countries. Results empirically demonstrate how internationalization flows of high-tech start-ups are motivated by the sourcing of host-country locational advantages, identified by the strength of the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of IPR protection.

Keywords: Entrepreneurship, International Business, High tech start-ups, New Technology Ventures, Born Globals, Early Internationalization, Internationalization Flows, Innovation Policies.

Table of contents

PART II - APPENDED PAPERS

Paper 1: G. Cannone, A. Pisoni, A. Onetti. Born global companies founded by young entrepreneurs. A multiple case study. *International Journal of Innovation and Entrepreneurship Management* (forthcoming).

Paper 2: G. Cannone, E. Ughetto. Born globals: a cross-country survey on high-tech start-ups. *International Business Review* (forthcoming).

Paper 3: G. Cannone, E. Ughetto. Internationalization flows of high-tech start-ups: a gravity model. Submitted to Journal.

Additional publications

Besides the appended papers, the following publications have been accomplished during the research work.

Cannone G., Ughetto E. (2013), Funding innovation at regional level: an analysis of a public policy intervention in the Piedmont region, *Regional Studies*, forthcoming.

Cannone G., Ughetto E. (2012), "Finanza pubblica a sostegno del capitale di rischio: quali iniziative regionali?", in NICOLAI M. Finanza Pubblica e Federalismo Strumenti Finanziari Innovativi: Autonomia e Sostenibilità, Primo Rapporto sulla Finanza Pubblica di Fondazione Rosselli, Maggioli Editore, Pages 675-704.

Cannone G., Pisoni A., Onetti A. (2012), "Drivers of international development for born global companies founded by Italian entrepreneurs. An empirical case study.", in Muffatto, M., & Giacon, P.. Entrepreneurial Strategies and Policies for Economic Growth. libreriauniversitaria. it ed..

Fantino, D., & Cannone, G. (2010). *The Evaluation of the Efficacy of the R&D European Funds in Piedmont*. mimeo.

PART I

1 INTRODUCTION

This chapter provides an explanation of the main rationale for undertaking this research study. The background section introduces the phenomenon under investigation and it presents the primary theoretical considerations. The second section provides the basis for the purpose of this study and also it introduces the main research design for the study. This chapter concludes with an overview of the thesis' structure.

1.1 Background

Entrepreneurship is a phenomenon of tremendous social importance. In recent years policy makers across several and diverse countries have realized and recognized the transversal importance of this phenomenon. Governments of advanced economies, facing a stagnating growth, recognize opportunity-driven entrepreneurship as a way to restart economic growth and to reduce youth unemployment; governments from developing and emerging countries, where entrepreneurship is more necessity-driven rather than opportunity-driven, are looking to entrepreneurship as a way to fuel economic growth and to create more qualified jobs which will lead to increasing life standard conditions. As a result, the policy agendas of policy makers from the United States, to European Union, from Chile to Singapore and to Nigeria are increasingly being characterized by the presence of some sort of policies or incentives to foster entrepreneurship.

Nevertheless, the phenomenon of entrepreneurship, as a key driver to fuel economic growth, has gained relevance only recently. To the exception of some countries such as the United States and Israel, only in the last decade the large majority of countries started to include within their portfolio policies, previously focused exclusively on the support of R&D/Innovation for SMEs (Cannone & Ughetto, 2012), tools and financial instruments to foster innovative new ventures (or startups).

The attention of policy makers on new ventures, was anticipated by social science literature, where entrepreneurship has strived for several years to gain legitimacy as a new academic field (Shane and Venkataraman, 2000) but which today has reached a recognized role, having defined its own theoretical boundaries; today there seems to be a consensus among scholars around the definition of entrepreneurship as a process characterized by an entrepreneur who recognizes and acts on opportunities and who organizes production factors in order to exploit these opportunities.

Although this widespread definition clarifies that entrepreneurship is a process that can occur in new or established firms (i.e. corporate entrepreneurship), the main subject of analysis of

entrepreneurship literature is the new venture or the so called start-up. Often academic studies consider the new venture and the SME as similar subjects characterized by a limited size (measured usually through the number of employees or through revenues). However, it is essential to point out why a SME and a start-up do not necessarily represent the same phenomenon; a firm can be a SME for several years or forever if there is no commitment to grow within the firm, the limited size of a start-up instead is related to a temporary condition of the firm which is in the first phases of its lifecycle; as consequence there are start-ups that might relatively soon become MNEs (e.g. Facebook, Google, Apple etc.) and other start-ups that will stay SMEs. According to the definition of entrepreneurship, the start-up or new venture, which generates from the intent of an entrepreneur to introduce some innovation into the market, by definition, represents an entrepreneurial process.

The study of the phenomenon of entrepreneurship and new ventures under an academic approach is essential because this is a complex phenomenon which involves at the same time at least three dimensions, i.e. opportunities, individuals and mode of organizing (L.W. Busenitz et al., 2003); hence a rigorous scientific approach could provide empirical evidence and explanations to the propositions and relationships underlying this complex framework. Results highlighted by scholars have provided and will continue to provide a valuable contribution to policy makers interested in fostering the creation of new firms.

Narrowing the focus on the main topic of my thesis, a new element adds further complexity to the phenomenon of entrepreneurship nowadays. Today indeed, the increased openness of economies, the emergence of global players, the firms' need for new sources of competitiveness and the technological advances in telecommunications, information and transportation have drastically reduced internationalization costs, reshaping the environment of business opportunities for entrepreneurs. In this context, start-ups are increasingly incentivized to exploit different geographical areas as a strategic asset in their decision making process regarding the organization of resources; all the mentioned technology-enabling factors indeed allow entrepreneurs to consider, select and compete for resources (i.e. human, finance, technology, infrastructure etc.) on a global scale and since the early stages of their enterprise life.

New ventures are increasingly conceiving internationalization as a process embedded in their overall growth path, no longer limited to sales activities, as theorized in the traditional internationalization models (Johanson & Vahlne, 1977), but also to R&D and innovation activities (Granstrand, Håkanson, & Sjölander 1993; Brockhoff, 1998). In addition, several innovative start-ups tend to adopt a global market vision from the outset and embark on rapid and dedicated internationalization through exportation or any other entry mode (the so called *born globals*, Knight & Cavusgil, 1996).

This posits new challenges for policy makers which cannot limit their efforts to facilitate the establishment of new domestic ventures but they are themselves competing on a global battleground to attract the best entrepreneurs and the most potential high growth new ventures (see Startup Chile program[1]). If some decades ago an entrepreneur would likely start a new venture in his/her own country and then he/she would start exporting in other countries, today entrepreneurs are more likely to start and scale their companies wherever this is more convenient for them, i.e. in those places where the best combinations of financial and human resources, assets, infrastructures etc. coexist. Setting the conditions to make a country attractive to internationally oriented new ventures is a critical issue for governments, because firms' internationalization flows are influenced by a complex mix of out-selection factors which can constrain or boost firms' preferences for international operations. Out-selection factors are both associated with the host country conditions (such as the general state of the economy, the legal framework, the presence of incentive policies, the cultural background, the strength of bilateral political relationships, of bilateral trade agreements, of internal networks etc.) and with global dynamics and challenges (such as changes in currency values, stock market conditions, unnatural or natural events etc.); moreover only some of the factors might be controlled and incentivized by policy makers while other are either not directly governable (e.g. the presence of private investors and industry) or they require a long time to be impacted (e.g. the quality of university and research system).

Notwithstanding several have been the attempts by policy makers to replicate the most celebrated areas for innovation, i.e. the Silicon Valley, generating quite often unsuccessful trials. Hence there is still a large room to improve policies to attract international ventures across different countries.

1.2 Research Purpose

The thesis analyzes the phenomenon of early internationalization for innovative start-ups approaching two main research questions: why do some firms incur in early internationalization? And where do those firms address their internationalization flows? The first question posits as subject of analysis the firm dimension, by exploring those factors which influence the choice for the entrepreneurs to start a born global company; the second question posits as subject of analysis the country dimension and the flows of internationalizations of these internationalized innovative start-ups to understand the factors that determine the attractiveness of countries for those types of firms.

[1] http://startupchile.org/ Start-Up Chile is a program of the Chilean Government to attract world-class early stage entrepreneurs to start their businesses in Chile. The program seeks to attract early stage, high-potential entrepreneurs to bootstrap their startups in Chile, using it as a platform to go global. The end goal of the accelerator program is to convert Chile into the definitive innovation and entrepreneurial hub of Latin America; this is a mission shared by the Government of Chile and is a primary focus of the Ministry of Economy.

The exploration of the first research question has generated a contribution to the international entrepreneurship literature both at the theoretical and at the empirical level. Although there are many theoretical and empirical contributions on born globals (and more generally on international entrepreneurship), it seems indeed that the literature still lacks a unifying paradigm that incorporates perspectives from different domains (Jones et al., 2011; Keupp & Gassmann, 2009). Accordingly, this thesis will propose a theoretical framework that builds upon the model developed by Oviatt and McDougall (2005) adapting and modifying the original model in order to shed some light on the different influences that affect the born global phenomenon and to include, together with the concept of the extent and the speed, the concept of the scope of internationalization through the degree of born globalness. The second contribution is at the empirical level, an attempt has indeed been made to empirically investigate the factors that mainly drive a firm's probability of internationalizing from the outset. To date, literature contributions have only offered insight into born global models of internationalization, using both quantitative and qualitative methodologies, for one particular country (Chetty & Campbell-Hunt, 2004; Jantunen et al., 2008; Knight & Cavusgil, 2004; Kuivalainen et al., 2007; Lopez et al., 2009; Zucchella et al., 2007), whereas the few attempts made to compare different experiences in several countries have mainly been of a qualitative nature (Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008; Gabrielsson & Pelkonen, 2008; Moen, 2002). Cross-country quantitative survey research in this field of study is somewhat scant and limited by small sample sizes (Johnson, 2004; Loane, Bell, & McNaughton, 2007). This research is one of the first cross-country, multi-level quantitative studies on born globals.

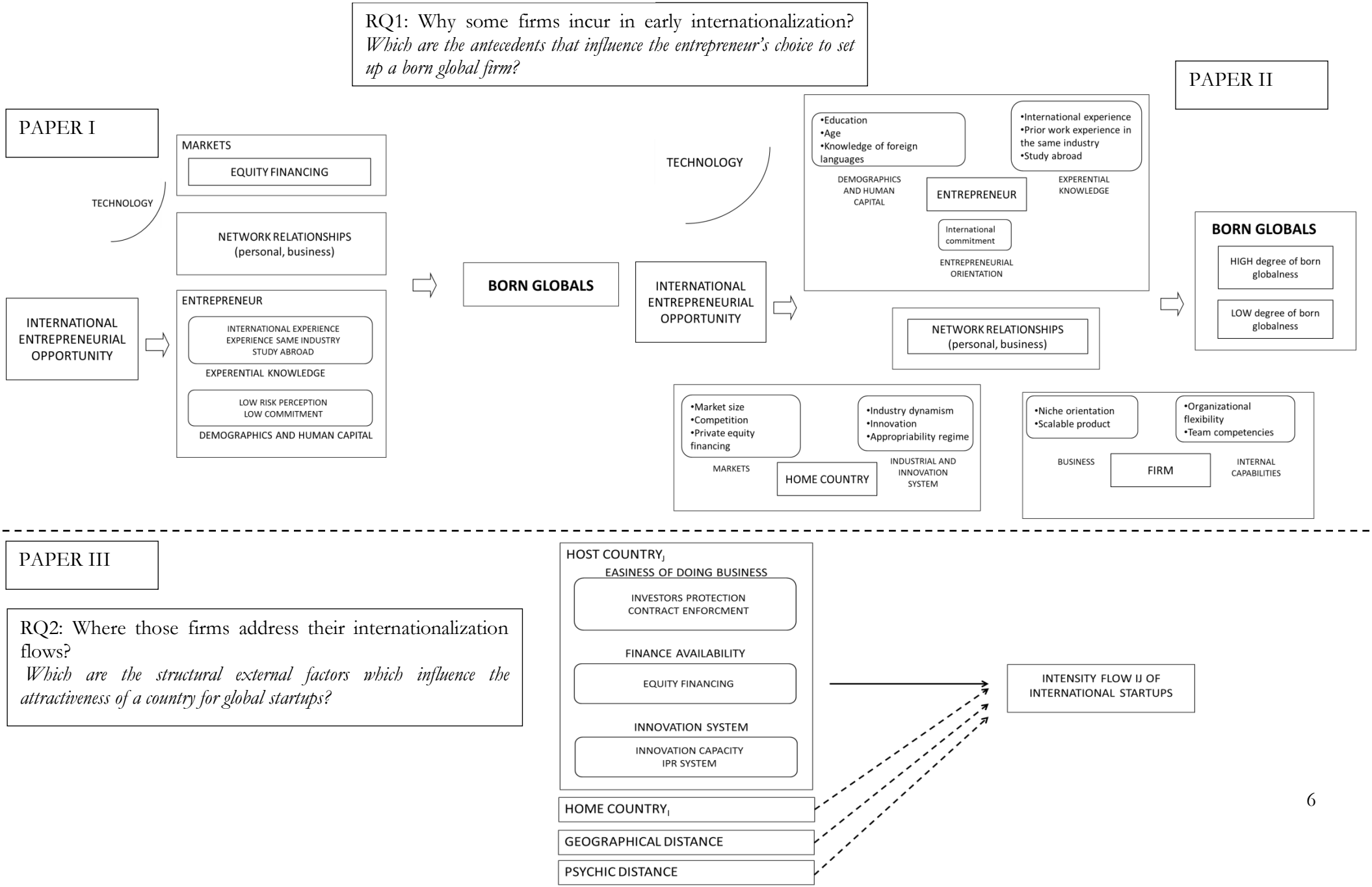
The second research question contributes to the international business literature in two ways. First, it provides a picture of the current patterns of internationalization for high-tech start-ups, through a map of the most attractive countries in terms of inbound and outbound internationalization flows. Second, this research is an empirical attempt to understand the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries. In particular, it examines whether internationalization flows of high-tech start-ups are motivated by the sourcing of the host-country locational advantages (such as the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of protection of intellectual property rights), controlling for the host country competitive conditions, market size, similarity of socio-cultural environment and distance from the home country. To date, the author is not aware of any other study that has examined to what extent the internationalization flows of high-tech start-ups are affected by host country conditions in a cross-country context.

1.3 Structure of the Thesis

The structure of thesis is divided into two main parts. Part I presents an introduction on the structure, the theoretical framework, the methodology and the results of the doctoral research. Part II presents the three appended papers that my research has generated and which are outlined in Figure 1.

The content and structure of the remainder of part I is organized as follows. Chapter 2 provides the theoretical framework and concepts of the study. It starts with a review of the literature on the entrepreneurship research stream highlighting how the intersection of three dimensions, opportunities, individuals and mode of organizing represents the core of this literature. Then the focus shifts towards the core of this study which is the international literature research stream with an emphasis on the phenomenon of *born globals*. After that, a brief review of the literature on young entrepreneurship provides some insights to support the first appended paper. Finally the last section of the Chapter reports some existing theoretical concepts related to internationalization of trades and innovation. Chapter 3 describes the methodological aspects of the study, including research design, research strategies, data collection, data analysis, and the assessment of reliability and validity. The reasons for the empirical choices made are also discussed. Chapter 4 provides an illustration of the main results achieved in the three appended papers. Finally, Chapter 5 includes a discussion of the most prominent results of the papers with respect to theory, managerial and policy implications, study limitations, suggestions for future research and concluding remarks.

Figure 1. Theoretical framework of the appended papers



2 THEORETICAL FRAMEWORK

This chapter presents the main theoretical arguments and the conceptual model related to the internationalization of high tech start-ups. The chapter begins with an introduction to the main theories and propositions of the contemporary entrepreneurship research; after that, a comprehensive literature review of the theoretical frameworks, propositions and relationship of the international entrepreneurship research stream is presented; in particular the phenomenon of born global firms is described. Some background on the literature on youth entrepreneurship is introduced. Finally, models, propositions and results on the internationalization of trade and innovation for small firms close the chapter.

2.1 Introduction to contemporary entrepreneurship research

Entrepreneurial activity has gained large attention from policy makers as a relevant vehicle to restore or preserve economic growth and to create employment; alongside, the desire to spread out new knowledge about entrepreneurship has attracted the interest of scholars in the last decades. Entrepreneurship is indeed relevant to scientific literature and not only to practicionnaires for several reasons. First, according to Schumpeter, (1934) entrepreneurially driven innovations are the engines driving the change process in the economy, second technical information is embodied in products and services, and entrepreneurship is the process that converts technical information into products and services (Arrow, 1962) and finally according to Kirzner (1997), entrepreneurship is able to discover and mitigate temporal and spatial inefficiencies.

Nevertheless, entrepreneurship as a research field has strived to become recognized by academics and it has reached legitimacy only in recent years. Indeed, according to Shane and Venkataraman (2000), a field of social science, to be legitimated, must have a conceptual framework that explains and predicts a set of empirical phenomena not explained or predicted by conceptual frameworks existing in other fields. A research field represents a community of scholars with a shared research interest defined by an accepted set of assumptions (L.W. Busenitz et al., 2003). To achieve legitimacy indeed, a research field should identify those boundaries able to distinguish it as a different entity within the entire academic spectrum. Some of the early studies on entrepreneurship seem to lack this requirement as they analyze the performance of individuals operating in small or new businesses, however the analysis of firms' performance and sustainability is a paradigm which characterizes studies in strategic management, hence this approach would not justify the emergence of

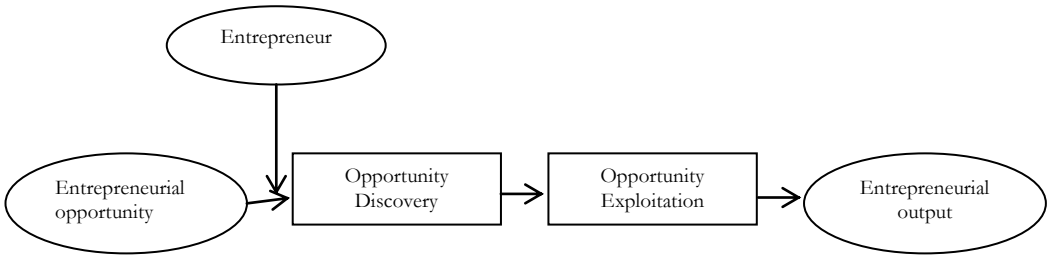
entrepreneurship as a distinguished academic field (Venkataraman, 1997). Beyond that, the analysis of performance is not sufficient to capture the complexity of the entrepreneurship phenomenon, indeed a performance advantage does not compensate for the opportunity cost of alternative options, for a liquidity premium for time and capital, and a premium for uncertainty bearing (Shane and Venkataraman, 2000). Therefore, conceptual frameworks that explain and predict performance are not sufficient to explain entrepreneurship.

For several years scholars have criticized the absence in the entrepreneurship research field of a unifying theoretical paradigm and coherent points of view (Aldrich and Baker, 1997) and the lack of intellectual boundaries (L.W. Busenitz et al., 2003), although several have been the attempts to propose a theoretical framework (Amit et al., 1993, Shane and Venkataraman, 2000, Venkataraman, 1997). A theoretical framework is based on theoretical concepts whose definitions are agreed among scholars. However, the definitions of entrepreneurship and entrepreneur have largely been debated in literature. Several researchers have focused on the characteristics of the entrepreneur in terms of what he/she is or what he/she does (Venkataraman, 1997). However this approach, missing the dimension related to opportunities which characterize the entrepreneurial process, generates incomplete definitions. Indeed, those definitions rely on equilibrium model theory, that is since people in equilibrium models cannot discover opportunities different in value from those discovered by others, a person becomes an entrepreneur solely based on his/her own qualities. For instance, in Khilstrom and Laffont's (1979) equilibrium model, entrepreneurs are people characterized by a positive attitude towards uncertainty. However the historical lack of homogeneous results which explain the characteristics of the entrepreneur in literature highlights how it is doubtful that entrepreneurship can be explained exhaustively through the characteristics of individuals without any references to the situations and contexts that surround themselves.

Despite, several scholars give a relevant weight to the situation and the context the entrepreneur operates in introducing the role of opportunities in the entrepreneur/entrepreneurship definition. Schumpeter (1965) highlights the relevance of opportunity in the entrepreneurial process as he defines entrepreneurs as "individuals who exploit market opportunity through technical and/or organizational innovation". Onuoha (2007) states that entrepreneurship "is the practice of starting new organizations or revitalizing mature organizations, particularly new businesses generally in response to identified opportunities." Bolton and Thompson (2000) have defined an entrepreneur as "a person who habitually creates and innovates to build something of recognized value around perceived opportunities". Shane and Venkataraman (2000) define entrepreneurship as "the process by which opportunities to create future goods and services are discovered, evaluated and exploited". This set of definitions generates implication on entrepreneurship research boundaries introducing in the research field the study of the sources of opportunities; the processes of discovery, evaluation,

and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them. It is interesting to note also that those definitions do not focus on the output of entrepreneurial act; indeed according to the definitions in literature, the entrepreneur does not need to be a firm founder but he/she can be entrepreneur also in an established organization (this statement allows to include within the boundaries of the entrepreneurship field also the study of corporate entrepreneurship). Further, entrepreneurship is described as a "process" rather than as a one-time event, action or decision. Indeed the decision to create and organize a new firm (or new product/service within an existing firm) is only one of several actions that must be undertaken in order to effectively discover, evaluate and exploit an opportunity (Figure 2). Later, Oviatt and McDougall (2004) added to this approach a new definition by referring to entrepreneurship as "the discovery, enactment, evaluation, and exploitation of opportunities to create future goods and services".

Figure 2. The entrepreneurial process.



Today there seems to be consensus that entrepreneurship research should stand at the intersection between three dimensions, i.e. opportunities, individuals and mode of organizing (L.W. Busenitz et al., 2003). Indeed, entrepreneurship is a multi-faceted phenomenon and a study focusing only on one or two of the three dimensions mentioned would lose the peculiarities of entrepreneurship research itself.

Entrepreneurial opportunities

According to Casson (1982), entrepreneurial opportunities are those circumstances where new goods, raw materials or methods of organizing can be sold at a price higher than their production costs. The main peculiarity of entrepreneurial opportunities, compared to the larger set of business opportunities, is that the former require a discovery or recombination of new means-end relationship rather than an optimization of existing relationships (Kirzner, 1997).

Entrepreneurial opportunities exist because different people have a different set of beliefs about the potential value a resource could have once transformed in a different state and about the price this good or service could have on existing and/or new markets (Kirzner, 1997). By exploiting this

misalignment of beliefs, the entrepreneur can sell his/her good or service at a price higher than its marginal production cost (Schumpeter, 1934). After that, if the entrepreneurial intuition was correct, and acted, he/she will be able to obtain an entrepreneurial profit, if the intuition was incorrect and acted, the entrepreneur will incur an entrepreneurial loss.

In literature there are two prevailing explanations for the presence of different beliefs among people. First, according to Kirzner (1973) people make decisions based on intuition, heuristics and information available; however different people have different set of intuition, heuristics and information, hence decisions will be different and some of them will be incorrect generating misallocation of resources. The second explanation is provided by Schumpeter (1934) who states that economies operate in constant disequilibrium characterized by changes in technology, politics, society and other dimensions; these changes generate a flow of new information about new ways to exploit resources; however being information distributed asymmetrically, economic actors who receive the right information before others can purchase resources below their equilibrium value and earn an entrepreneurial profit by recombining and selling them on the market.

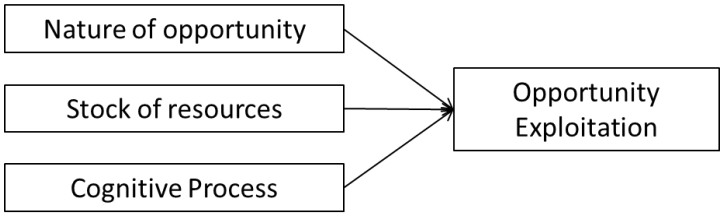
Nevertheless, the existence of an entrepreneurial opportunity is not per se a guarantee for an entrepreneurial process, indeed the entrepreneur plays a primary role in the enactment of the process since to achieve an entrepreneurial output the entrepreneur needs first to discover the opportunity and then he/she needs to decide to exploit it.

Starting from the first step of the process (see Figure 2), the entrepreneur needs to recognize an entrepreneurial opportunity. Since information is imperfectly distributed and people have different beliefs, at any given time there will be people discovering a given opportunity and people not discovering the same opportunity. According to Shane and Venkataraman (2000) those who discover opportunities have two characteristics: the necessary prior information to identify an opportunity and the cognitive properties to value it. Hence, although different people might possess the prior information necessary to discover an opportunity, someone might be able to perceive the new means-ends relationships while other might not be able. Several scholars state that people have different abilities to combine existing concepts and information into new ideas (see Ward et al. 1997, for several review articles) also providing empirical evidence (see Busenitz & Barney, 1996; Kaish & Gilad, 1991; Shaver & Scott, 1991). Sarasvathy, Simon, and Lave (1998) show that entrepreneurs perceive as opportunities situations which other people perceive as risks; Baron (2001) found that entrepreneurs are less likely to engage in counterfactual thinking (i.e., less likely to invest time and effort imaging what "might have been" in a given situation), less likely to experience regret over missed opportunities, and less susceptible to inaction inertia.

The second step of the entrepreneurial process is the exploitation of opportunities (see Figure 2). There are several reasons that motivate the entrepreneur to act or not to act on a given opportunity

(Figure 3). First, the nature of the opportunity itself ì, i.e. its size and its value, influences the decision of the entrepreneur to pursue it.

Figure 3. Reason that determines the exploitation of an entrepreneurial opportunity



Second, the stock of previous resources the entrepreneur owns influences the decision to act on that perceived opportunity. Liquidity and time to invest are necessary resources to enact the opportunity; hence for instance entrepreneurs who have a lower cost of resources, e.g. greater financial capital (Evans and Leighton, 1991), are more likely to exploit opportunities. Cooper et al. (1989) found that people who have developed useful information from their previous employment tend to exploit opportunities more easily because such information reduces the cost of opportunity exploitation.

A third important aspect that plays a relevant role in the enactment decision is the cognitive process of the entrepreneur. The exploitation of an entrepreneurial opportunity implicates downside risk, because time and capital must be invested before the distribution of returns is known (Knight, 1921; Venkataraman; 1997); people have different risk aversion attitudes and this influences the decision to exploit entrepreneurial opportunities (Khilstrom & Laffont, 1979; Knight, 1921). Moreover, Palich and Bagby (1995) found that people who exploit opportunities tend to frame information more positively and then to respond to these positive perceptions. Further, people who exploit opportunities typically perceive their chances of success as much higher than they really are and much higher than other players in their industry perceive (Cooper, Woo, & Dunkelberg, 1988); moreover people who exploit opportunities, on average, are overly optimistic about the value of the opportunities they discover.

Other individual differences contribute to explain why entrepreneurs are more willing to act on entrepreneurial opportunities. Researchers have claimed that self-efficacy and internal locus of control influences positively the choice of exploitation because this choice requires people to act in the face of skepticism of others (Chen, Greene, & Crick, 1998). Similarly, people who have a greater tolerance for ambiguity and those with a high need for achievement have a higher probability to exploit opportunities (Begley & Boyd, 1987, McClelland, 1961).

To conclude it is relevant to highlight that those individual characteristics that increase the probability for an entrepreneur to exploit opportunities does not necessarily increase the probability

of the entrepreneurial output to have success. For instance, over-optimism might increase the probability of failure; indeed individuals who discover opportunities in a given industry but are pessimistic may choose not to exploit discovered opportunities because they estimate more accurately what it will take to compete and how many other people will try to do similar things.

2.2 International entrepreneurship

International business is a well-established academic field which has traditionally focused on established and large multinational enterprises (MNEs) willing to expand abroad. Indeed, international business literature provides multiple established theories that explain global expansion through market entry and the creation of new or joint ventures in other countries. Nonetheless, although entrepreneurs conduct business internationally, the two paths of research, entrepreneurship and international business, have not crossed for several years. Indeed, the early studies on entrepreneurship have focused primarily on venture creation and the management of small and medium-sized businesses within the domestic context. In the last decades, the globalization of the world economy has forced and enabled also new ventures to consider their business in a global dimension. Businesses are seeking international competitive advantages through entrepreneurial innovation (Simon, 1996). Moreover, advancements in communications technology and in transportation combined with the decrease of protectionist policies in most OECD countries have established the conditions for many new ventures to view their operating domains as international.
As a result of these trends, the intersection between international business and entrepreneurship, i.e. international entrepreneurship (IE), has become of increasing relevance and has attracted a large numbers of scholars.

Definition of international entrepreneurship

The definition of international entrepreneurship has been shaped through the contribution of several scholars over the past decades. An early definition was provided by McDougall (1989) describing IE as a field focusing on the international activities of new ventures as opposed to established firms. Later, Wright and Ricks (1994) defined international entrepreneurship a field studying firm-level business activity that crosses national borders, where such activity focuses on the relation between businesses and the international environments in which they operate. More recently McDougall and Oviatt (2000) provide the definition of international entrepreneurship as "a combination of innovative, proactive, and risk-seeking behavior that crosses national borders and is intended to create value in organizations". Zahra and George (2002), define international entrepreneurship as "the process of creatively discovering and exploiting opportunities that lie outside a firm's domestic markets in the pursuit of competitive advantage" stressing the importance

of opportunity recognition, discovery and exploitation as a distinguishing characteristic of entrepreneurship (Shane & Venkataraman 2000). These recent definitions helped to shift attention away from using the age of the firm or timing of internationalization as the sole criterion to define international entrepreneurship.

Since mid-90s, an increasing number of articles on cross-cultural differences in entrepreneurial activity and on entrepreneurial firms that compete across national borders have enriched and broadened international entrepreneurship research; this trend has been possible because on one side international business scholars have extended their traditional focus on MNEs to include entrepreneurial firms in their research agendas, and on the other side entrepreneurship researchers began to focus on cross-border analysis, also thanks to the larger availability of cross-countries databases (e.g. Crunchbase). To conclude, in order to examine entrepreneurial issues across multiple cultures, international business researchers cannot ignore the increasing relevance of entrepreneurial firms in international competition, as one of the most important features of today's global economy is the growing role of young entrepreneurial new ventures (Almeida & Bloodgood 1996; Bell 1995; Clark & Mallory 1997; Fujita 1995; Haug, 1991); nor can entrepreneurship researchers ignore that entrepreneurial firms are increasingly competing on an international ground.

Theoretical framework

As a very recent research stream at the intersection of an established research field, international business, and of another recent field, entrepreneurship, international entrepreneurship lacks a unified theoretical framework that connects the antecedents, types, and outcomes of entrepreneurial activities pursued by new ventures and established companies (McDougall & Oviatt 2000; Oviatt & McDougall 1999). Scholars have indeed concentrated on multiple theoretical perspectives and methodologies, which are indeed insightful and informative, however this heterogeneity raised questions about the overall value added of this new research stream. The most widespread theoretical perspectives in international entrepreneurship studies are the resource-based view (Autio et al. 1997; Bloodgood et al. 1996), transaction cost theory (Steensma et al. 2000; Zacharakis 1997), organizational learning (Autio et al. 2000; Zahra, Ireland & Hitt 2000) and product life cycle theory (Roberts & Senturia 1996).

The attempts to develop a well-grounded framework underlying international entrepreneurship research have focused mainly on the application of theoretical perspectives that explain the phenomenon of early internationalization of new ventures; existing traditional frameworks have been criticized as they are not able to explain this phenomenon (e.g., McDougall, Shane & Oviatt 1994; Oviatt & McDougall 1994).

However, according to the recent definitions of entrepreneurship which includes also corporate entrepreneurship (see section 2.1), entrepreneurial activities generated from within large corporates should be explored within this research stream too. Hence, companies of different ages and sizes often engage in entrepreneurial activities and they venture into international markets (Zahra & Garvis 2000), as consequence these firms should be included in the study of international entrepreneurship.

Beyond that, still doubts remain on the uniqueness of research questions that should be addressed through the lenses of IE. McDougall and Oviatt (2000) propose a list of topic to be included such as cooperative alliances, corporate entrepreneurship, economic development activities, entrepreneur characteristics and motivations, exporting and other market entry modes, new ventures and IPOs, transitioning economies, and venture financing. Notwithstanding some of these topics have been largely explored by traditional entrepreneurship literature, international business or strategy; hence according to Zahra and George (2002) the distinguished feature for international entrepreneurship research stands at the intersection between entrepreneurship and internationalization processes, i.e. "the innovativeness and risk taking that firms undertake as they expand their international operations". Those propositions that bring new perspectives and strategies on how, what, when and why to internationalize a business activity give meaning to the international entrepreneurship phenomenon.

Methodologies in international entrepreneurship

Reviewing the past literature on this research stream, there are two considerations to be taken into account. First, the large majority of studies are based on US samples (Bloodgood et al. 1996; McDougall 1989; McDougall & Oviatt 1996; Zahra et al. 2000; Zahra & Garvis 2000); only few are based on non-US firms (Autio et al. 2000, 1997, Holmlund and Kock, 1998, Coviello and Munro, 1995, Fontes and Coombs, 1997). In addition, very few are the studies that consider samples including firms from multiple countries and hence the potential differences in international entrepreneurship across countries; this is a major limitation given that IE research, by definition, involves cross-national studies. Second, the large majority of past research relies mostly on case studies (Tiessen & Merrilees, 1999) or limited size samples of no more than 70 firms (Autio et al., 2000, Bloodgood et al., 1996, McDougall and Oviatt, 1996). Moreover the majority of studies focus on high technology firms whereas very limited are those focused on low technologies or services (Burgel & Murray 1998; Fontes & Coombs 1997; Karagozoglu & Lindell 1997; Reuber & Fischer 1997; Zahra et al. 2000, Mößlang 1995).

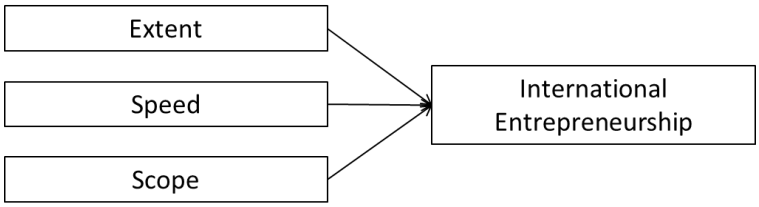
Furthermore, another limitation of methodologies characterizing past research in IE relates to the lack of longitudinal studies, indeed the cross-sectional research designs in past research has resulted

in non-cumulative and inconsistent findings. Longitudinal studies, which can be especially helpful in identifying the potential causal links among variables of interest, would be essential since the dimension of time has been proved to be key in studies of internationalization (Buckley and Chapman, 1996; Andersen, 1997) and of entrepreneurial behavior (Chandler and Lyon, 2001).
To conclude, although a unique methodological approach would be not suitable to IE research, it is yet crucial to develop a IE common set of methodologies and techniques that allows for comparison between studies. This would contribute to a unifying methodological direction.

Measures and variables in international entrepreneurship

According to Zahra's and George's (2002) review of international entrepreneurship literature, there are three key dimensions prior research has focused on: the extent of new firm internationalization, the speed of internationalization and the scope (Figure 4). The extent of internationalization typically refers to sales and it is generally measured by the amount of revenues generated through exports, i.e. percentage of revenues from exports on total revenues; the speed refers to precocity of internationalization, measured by the length of time that elapsed between the year the venture was created and the year of its first foreign sales; finally the scope is a measure of the width of the internationalization of a firm, measured by the number of countries in which the venture exports or in which it has a presence through other activities (manufacturing, research & development, etc.).
The majority of studies focus on the extent of firm's internationalization, while fewer are those that include also speed and scope of internationalization. This thesis contributes to this literature gap by providing a comprehensive theoretic framework and empirical analysis that consider the three dimensions, extent, speed and scope.

Figure 4. Dimension of entrepreneurship internationalization

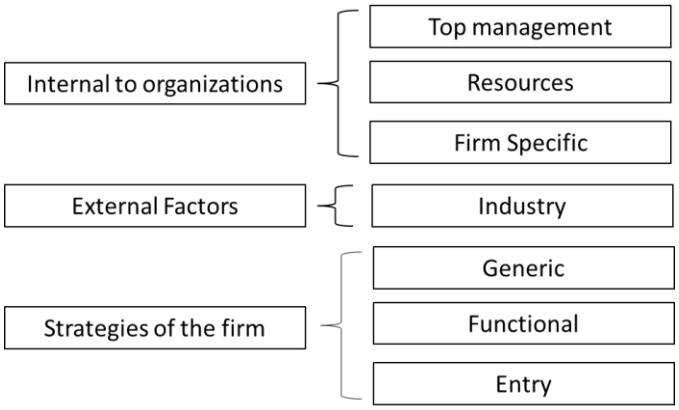


Oviatt and McDougall (2005) develop a model of the forces influencing the speed of internationalization. They argue that speed is enabled by technology, motivated by competition, and moderated by the knowledge intensity of the opportunity and the firm's international networks. This model is the theoretical starting point for the second paper appended.
Moreover, Gabrielsson et al. (2008), explore further the concept of speed by stating that the temporal factor for born globals affects two dimensions, precocity and rapidity. The former is

related to the early start of internationalization, while the rapidity issue concerns effectiveness (Zuchella, Danicolai, & Palamara, 2007) namely, successful BGs exhibit broad entrepreneurial scope in the key country markets of their industry segment, high intensity of focus and rapid growth. This approach is different from a SME that goes international early but they might not have a global vision, a corresponding commitment, and implementation capability. In this case, this latter firm may meet the standard of precocity but lack the effectiveness to achieve rapidity and to perform in global markets.

The variables identified in IE's previous studies can be categorized into three categories: internal to the organizations, external factors and strategies of the firm.

Figure 5. Categorization of variables identified in international entrepreneurship



Concerning organizational factors, researchers have relied on three aspects heavily investigated in strategy and entrepreneurship studies, i.e. the characteristics of top management team, firm resources, and firm-specific variables. The characteristics of the top management team, which in very early stage firms may correspond to the co-founders/entrepreneurs, such as foreign work experience, foreign education, background, vision and commitment have been investigated in literature. Exposures to international markets or market practices significantly influence the firm's decision to internationalize. These findings are corroborated through case study analyses (Oviatt & McDougall 1995; McDougall et al. 1996) and few empirical studies (Bloodgood et al. 1996; Burgel & Murray 1998). Autio et al. (1997) found that firms with a high growth orientation were likely to internationalize their operations. This finding highlighted the importance of the entrepreneurial attitudes in shaping the strategic direction of their enterprises (Finkelstein & Hambrick 1996) in terms of global expansion.

The firm resources which have been considered in order to explain their relationship with internationalization process are product innovativeness (Burgel & Murray 1998), intangible assets such as reputation and networks (Zahra et al. 2000) and financial resources. Firm's financial

resources were considered in several studies as enabling factors to support international expansion. Zahra et al. (2000) concluded that past ROE was not significantly associated with the status of internationalization and positively but marginally associated with the speed and degree of sales internationalization. In terms of financial leverage, Bloodgood et al. (1996) reported a non-significant association with the degree of internationalization, raising a question about the potential contribution of past performance to new ventures' internationalization, probably an explanation might be found in the presence of external sources of finance to support internationalization (e.g. venture capital). Finally, firm-specific characteristics such as age and size, proxy for experience and resources, location and origin have been related to internationalization output. To capture firm size the typical measures such as the number of employees and the size of sales are used; many studies consider firms with less than 100 employees (Coviello and Jones, 2004). Age involves more heterogeneity across studies, from the review of literature made by Coviello and Jones (2004) there are some studies focusing on firms less than 6 years old, other 7-10 years old, 11-12 year old until studies examining firms older than 20 years old.

In addition to organizational factors, external environmental factors play also a relevant role in influencing internationalization processes. External environment is a dimension largely considered both in strategic management and entrepreneurship (Boyd et al., 1993; Zahra & Bogner 2000). The role of industry has been investigated in different studies (Roberts & Senturia 1996; Zahra et al., 1996). In particular, the characteristics of the industry (or its segments) may significantly moderate the relationship between international entrepreneurship and the performance output from this activity (Zahra and Garvis, 2000); for instance the large majority of studies exploring the phenomenon of early internationalization analyzes high tech industries. Finally researchers have used different measures for industry attributes creating difficulties to compare findings across different studies.

The third category identified in past international entrepreneurship research is company's competitive strategy on international entrepreneurship such as generic strategies, functional strategies, and entry strategy (Zahra and George, 2002). Within generic strategies, cost and differentiation strategies were examined in previous studies; Bloodgood et al. (1996) and Fontes and Coombs (1997) found that product differentiation approach was positively related to internationalization. Autio and colleagues (1997) stressed the positive influence of R&D spending and international collaborative relationships in the internationalization process as means to provide the knowledge resources to accelerate international expansion (Zahra et al., 2000). Functional strategies include production, distribution, marketing functions and their relationships. Roberts and Senturia (1996) demonstrate the relevance of product attributes such as uniqueness and customization, while McDougall (1989) and Bloodgood and colleagues (1996) found for

international new ventures a lower emphasis on distribution and marketing strategy. International new ventures have also been examined in terms of entry strategy; McDougall (1989) found that those types of firms emphasize a large-scale entry strategy significantly more than small ventures. Fontes and Coombs (1997) found that niche market approach is more frequent for international new ventures. Beamish (1999) posits the accent on alliances as appropriate mode of entry choices for international entrepreneurship. To sum up, still few studies have explored competitive strategy variables in international entrepreneurship and in addition there is yet a lack of a comprehensive theoretical framework.

Those dimensions, i.e. organizational factors, external factors and firms strategies, act as determinants or moderator on early internationalization. Nevertheless, another dimension which has not yet been examined in a proper way is the output of international entrepreneurship. Traditional entrepreneurship literature states that the outcome of the entrepreneurial process is not limited to the creation of a new venture, moreover contrary to strategy literature the outcome is not limited to performance indicators, indeed the improvement of economic conditions, the introduction of technology changes can be outcomes of the entrepreneurial process. For international entrepreneurship, financial and non-financial performance indicators have been used to measure international entrepreneurship outcome. Past empirical research in international entrepreneurship has provided inconclusive results regarding the link between international entrepreneurship and performance. Bloodgood et al. (1996) found a positive and marginally significant relationship between international entrepreneurship and firm income, conversely to Zahra and Garvis (2000) that found no relationship between international entrepreneurship and return on assets, and McDougall and Oviatt (1996) that reported a non-significant relationship. In addition, studies relating international entrepreneurship to non-financial performance are even fewer and more inconclusive, Oviatt and McDougall (1995) connected international entrepreneurship to market share, while Zahra et al. (2000) related international entrepreneurship to technological learning and acquisition of new knowledge. The importance of non-financial outcomes of international entrepreneurship posits the need to further improve future research in this area.

To recap this section, the key research question in international entrepreneurship should be "how, why, and when do entrepreneurial firms discover and exploit opportunities outside their home country?" This question generates several research issues. First, the analysis of the drivers that influence the choice of new venture to look at opportunities beyond its domestic market; among the drivers mentioned above, the top management team characteristics (e.g. ability, previous experience, composition etc.) and firm resources (e.g. financial strengths, social capital and network etc.); this research issues is at the basis of the analysis carried out in the first and second papers of this study. The second research issue is the analysis of the dimension of international entrepreneurship. The

review of the literature suggests three dimensions to consider, i.e. extent, speed and scope. Future research may strengthen the results on the relationship between top management team, resources, firm characteristics and the dimensions of international entrepreneurship. The second paper adds to the literature by including in the analysis the exploration of the dimension of the scope of internationalization.

2.2.1 The Born Globals phenomenon

The central phenomenon analyzed within the international entrepreneurship domain is the early internationalization of new ventures which accounts for a large majority of studies (Jones, Coviello, & Tang, 2011). Over the last two decades, the observation of an increasing number of firms which aim for international markets right from their start has generated critiques by scholars (see, for a review, Jones et al., 2011; Keupp & Gassmann, 2009; Kiss et al., 2012) to the traditional models of internationalization, the stream of research originated from what was later labeled the Uppsala Internationalization Model (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). This school of thought posited that firms gradually internationalize through a series of evolutionary stages. A great deal of empirical research in the international business field has adopted this type of approach to study internationalization positions, paths and processes. Nevertheless this approach was criticized by several scholars observing the phenomenon of the so called born globals (BGs).

The BGs phenomenon involves firms, which are often small and technology-oriented, that tend to adopt a global market vision from the outset and embark on rapid and dedicated internationalization through exportation or any other entry mode, thus skipping some stages of the traditional internationalization process (Knight & Cavusgil, 1996). The most common term to identify these companies is "born globals" (Rennie, 1993; Knight & Cavusgil, 1996; Madsen & Servais, 1997). Such companies have also been labeled as global start-ups (Oviatt & McDougall, 1995), international new ventures (McDougall, Shane, & Oviatt, 1994; Oviatt & McDougall, 1994; 1997), born internationals (Kuivalainen, Sundqvist, & Servais, 2007) or born regionals (Lopez, Kundu, & Ciravegna, 2009). Although it seems that scholars do not use the definitions consistently, the original definition of international new ventures refers to those firms founded with the intent to internationalize quickly, while the definition of born globals identifies those firms characterized by a defined extent and speed of internationalization.

The studies on born globals have evolved over the last decades; in late 80s scholars have concentrated on the comparisons between different types of international ventures. Only in the early 2000s studies on comparisons between international entrepreneurship across multiple countries appeared.

Among the earliest studies on born globals, emerged in 1989, the major topic is on entrepreneurial internationalization (Jones et al. 2011), i.e. a focus on entrepreneurship across national borders. Within this early research stream, studies include comparison between different types of international ventures, the patterns and processes of internationalization and the influence of organizational issues analysing performance, orientation, knowledge and capabilities.

The first relevant theme is the comparison between different types of international ventures (Jones et al., 2011) and the isolation of those characteristics of the entrepreneur which drive him/her to start an international venture (or born global). Some authors indicate that BGs differ from gradually globalizing firms in their mindset and risk tolerance levels (Harveston et al., 2000), in their international experience (Harveston et al., 2000; Zhang et al., 2009), in their international learning and network capabilities as well as their international entrepreneurial capability (Zhang et al., 2009); according to this stream of studies, many behavioral variables are used to compare venture types such as motivation, market selection, entry modes, competitive advantage, entrepreneurial orientation, strategy and performance. Moreover, other results indicate that risk-taking, proactiveness and the age of the entrepreneur affect the decision to establish a new international venture (Kropp et al., 2008).

As mentioned in the previous section, fewer studies focus on the performance of born globals; however results from those studies support that early internationalization can enhance firm growth (Autio et al., 2000), while entering diverse international markets can increase technological learning and improve performance (Zahra et al., 2000).

A second important theme concerns the patterns and processes of internationalization referring mainly to the dimension of the speed of internationalization. More recently, a new typology of pattern was identified, i.e. the "born-again global"; as defined by Bell et al. (2001), these firms suddenly embrace rapid and dedicated internationalization from a well-established position in their domestic market and with no apparent motivation to internationalize. Networks and social capital are also relevant factors which influence pattern and processes of early internationalization; among the earliest studies stressing the role of network and relationships, Coviello and Munro (1995) map network patterns to show that foreign market entry and the modes used by entrepreneurial ventures are often a reflection of the firm's network ties. Casson (1997) states that the network is a more appropriate and efficient means of coordination than the firm or market are.

Finally, a third theme considers the influence of organizational issues including studies on performance, orientation, knowledge and capabilities in the context of entrepreneurial internationalization. Those kind of studies explore performance antecedents such as international work experience, product differentiation and firm size (Bloodgood et al., 1996), formal export planning and technological sophistication (Zahra et al., 1997), attitudes toward foreign markets and

government assistance (Preece et al., 1999), an entrepreneurial orientation (Jantunen et al., 2005) and organizational structure, opportunity-driven behavior and the founder's technical knowledge (Kocak and Abimbola, 2009). Nevertheless some of these studies show inconsistent results. For example, Zahra et al. (1997) find that venture age but not size has an impact on international intensity, while Zahra et al. (2003) question the influence of both age and size (and past performance) in explaining the speed and scope of internationalization, giving a major role to intangible technological resources such as networks and reputation in explaining internationalization intensity. Beyond performance, orientation is another variable considered in these types of studies; IE research examines the effect of entrepreneurial orientation (EO); according to Knight (2000), EO influences the firm's response to globalization developments, technology acquisition and preparation for internationalization; firms with a high EO have higher extent and scope of internationalization (Ripollés-Mélia et al., 2007). Moreover, research on organizational issues includes also studies concentrated on the topics of knowledge and capability; for instance Sapienza et al. (2005) show that learning effort in international and domestic markets is positively influenced by the firm's EO and the length of internationalization.

Quite surprisingly, from the review of the literature it emerges that there are very few studies which examine entrepreneurial internationalization in a comparative cross-national manner. These kinds of studies appear only in the first years of the last decade. To sum up some of the results emerged from the few studies within this stream, studies comparing firms in Norway and France show slightly different results and indicate that, although the market situation is important, the early decisions of the firm also influence export development and the extent to which a firm is a born global rather than a born local or a late global (Moen, 2002). This view is similar to findings from Sweden and Finland that the founder and his/her global vision at inception are key factors in a firm that demonstrates rapid and early internationalization patterns (Gabrielsson and Pelkonen, 2008). Data from the United States, the United Kingdom, Australia, Canada, Ireland and New Zealand indicate the management team's combined creativity, knowledge and resourcefulness is also important in rapid or dynamic internationalization, particularly in knowledge-based sectors (Johnson, 2004; Loane et al., 2007). Cross-country research also shows that networks are crucial in leveraging external resources such as venture capital or angel funding (Loane et al., 2007), and that firms is heavily committed in building them (Loane and Bell, 2006).

Although entrepreneurial internationalization cross-national research is truly at the intersection of international business and entrepreneurship, these typologies of studies are still very few and do not provide yet comprehensive and coherent findings. One reason is the lack of institutional data and research behind these studies, while the use of institutional and cultural theory to help explain the

existence and behavior of different international venture types across countries and cultures is key in order to develop cross-national comparative research.

The second paper appended contributes to the literature on born globals by providing a theoretical framework and empirical evidence on a cross-national context. To date, literature contributions have only offered insight into born global models of internationalization, using both quantitative and qualitative methodologies, for one particular country or for comparison among few countries (Chetty & Campbell-Hunt, 2004; Jantunen et al., 2008; Knight & Cavusgil, 2004; Kuivalainen et al., 2007; Lopez et al., 2009; Zucchella et al., 2007), while the few attempts made to compare different experiences in several countries have mainly been of a qualitative nature (Gabrielsson et al., 2008; Gabrielsson & Pelkonen, 2008; Moen, 2002). Cross-country quantitative survey research in this field of study is somewhat scant and limited by small sample sizes (Johnson, 2004; Loane et al., 2007).

Operationalization of born globals concepts

Born globals have been operationalized in several ways. McKinsey & Co. in 1993 define BGs as those firms internationalized within two years after inception and with 76% of revenues from exports; Knight & Cavusgil (1996) adopt three years after inception as upper bound for the speed of internationalization and 25% of revenues from exports as lower bound of the extent of internationalization; McAuley (1999) reduces to 1 year the period to internationalize and does not specify any minimum amount of exports; Zahra (2000) relaxes the boundaries to six years after inception and at least 5% revenues from exports. Lately the operationalization by Knight & Cavusgil seems to have gained consensus among scholars (Moen, 2002; Kinght & Cavusgil, 2004; Mort & Weerawardena, 2006; Servais et al., 2007) and this is the operationalization used in the second paper appended.

Moreover the second paper appended explores also the scope of internationalization as one of the three key dimensions in the born globals phenomenon. Some scholars have only questioned the qualification of born globals in terms of the length between the time the company was created and the time of the first exportation and percentage of revenues from the exports (speed), without considering whether these firms engage in activities on multiple and distant markets or in a few nearby countries (Kuivalainen et al., 2007; Lopez et al., 2009). The internationalization strategy of a firm can in fact also be defined in terms of the scope of its international operations. The second paper distinguishes between born globals with a high degree of born-globalness and born globals with a low degree of born-globalness. This distinction has been made considering the scope of internationalization (i.e. the number of markets involved). To date, no other study has examined, through the lenses of an interpretative framework, to what extent the degree of born-globalness of a firm is the result of a complex mix of firm, environmental and entrepreneurial factors.

Table 1. Operationalization of born globals concept in previous studies.

Authors	Revenues from exports	Timing
McKinsey & Co., 1993	>76%	≤2 years
Knight & Cavusgil, 1996	≥ 25%	≤3 years
McAuley, 1999	-	≤1 year
Zahra, 2000	≥ 5%	≤6 years
Moen, 2002	≥ 25%	≤3 years
Kinght & Cavusgil, 2004	≥ 25%	≤3 years
Mort & Weerawardena, 2006	≥ 25%	≤3 years
Servais et al., 2007	≥ 25%	≤3 years

2.3 Youth entrepreneurship

Youth entrepreneurship is the phenomenon regarding young people who actively engage in the entrepreneurial process. Even though there is no unique definition of young entrepreneurs, this population is usually identified as the subset of entrepreneurs under the age of 35 years (General Entrepreneurship Monitor, Kelley et al. 2011). According to GEM Adult Population Survey (Kelley et al. 2011), there are 165 million young early stage entrepreneurs between the ages of 18 and 35 in the world.

Although the size of the phenomenon and although most policy makers put a particular effort in fostering and supporting young potential entrepreneurs, academic literature has not focused specifically on this subset of entrepreneurs. Indeed, different scholars (Chiungta 2002, Lewis and Massey 2003, Schoof 2006) identify the absence of specific academic contributions focused only on young entrepreneurs 'in action', in the top journals of business administration and entrepreneurship. A critical gap in the literature is the development of theories and specific studies that apply and investigate specifically on this sub-set of entrepreneurs. Indeed although there are studies on entrepreneurial intentions among populations of students or young people (Souitaris et al. 2007) and on policies and local initiatives for fostering and stimulating young entrepreneurship (Kuratko 2005, Harmeling and Sarasvathy 2011), literature does not offer neither clear and comprehensive empirical evidence of the phenomenon nor theories explaining the specificities of young and innovative entrepreneurship are lacking. Indeed existing theoretical frameworks (Shane 2003, Sarasvathy, 2001) do not consider the subset of young entrepreneurs.

The research gap originates both from methodological and theoretical aspects (Giacon and Muffato, 2012). From a methodological point of view, few relevant and significant sets of young entrepreneurs data are available for researchers as general data, moreover lists of small and medium

entrepreneurial companies provided by local or national institutions, are not enriched by information about the age of the entrepreneurs. From a theoretical point of view according to Lewis and Massey (2003) the tentative to build entrepreneurship as a research field created a holistic approach to entrepreneurial phenomena that lead scholars to elaborate and create general theories of entrepreneurship. As a result, age is often considered as a standard variable rather than a sampling variable.

The necessity to explore the phenomenon of youth entrepreneurship through scientific research stands under the assumption that young entrepreneurs are different from "non-young" entrepreneurs. Following the framework by Hafterdorn and Salzano (2003), specific research should be carried out in order to better understand how the constraints which hinder young entrepreneurs are overcome or can be removed by regulation or governmental intervention. Entrepreneurs need tangible and intangible resources to accomplish the entrepreneurial process; financial resources are a major problem for young entrepreneurs (Stevenson, 1987) because they usually have not yet accumulated personal assets to use as collaterals for a bank loan, moreover they often are not perceived as reliable by financial actors to establish a new loan or to receive an investment from private investors. Beyond financial, also emotional and social assets are differently distributed between young and non-young entrepreneurs. Intangible resources necessary to start the entrepreneurial process indeed regard the emotional support; contrary to elder entrepreneurs, young entrepreneurs are more sensitive to their parental suggestions and emotions (Giacon and Muffato, 2012). The investigation of this aspect could enhance the comprehension of the psychological mechanism underlying the choice to undertake an entrepreneurial career: as asserted by Baron (2008) and Hayton and Cholakova (2012), affects and emotions are central for understanding entrepreneurial phenomena. Related to this, another important aspect to be considered with young entrepreneurs is the relationship between parents and daughters/son, largely explored in family businesses; in particular the relationships between (non-) enterprising parents and their (non-) enterprising daughters/sons. Further, as explained by entrepreneurship literature, a third asset relevant to become a successful entrepreneur is his/her social capital. Previous managerial or entrepreneurial experience and a minimum amount of relational capital are important factors influencing and in some cases predicting an entrepreneurial career; young entrepreneurs lack or have a reduced set of these characteristics.

In addition, risk aversion and responsibility tend to grow with age (Timmons and Spinelli 2010). Young entrepreneurs often undertake risky decisions also because it is less likely for them to have responsibilities as loans, children etc. In addition, commitment towards education, commitment towards family and children, management skills, alertness, drive and energy, wisdom and judgment,

social capital and several other traits and predictors tend to grow with age (Giacon and Muffato, 2012).

To conclude, since the phenomenon of young entrepreneurship is increasingly relevant for policy makers and since young entrepreneurs are characterized by individual traits and access to resources which are different from "non-young" entrepreneurs, it is essential to explore further this subset of entrepreneurs so to better understand how to further support and foster origination of new young entrepreneurs' activity.

2.4 Trade flows and internationalization of innovation

In several countries policy makers have paid special attention to innovative start-ups, characterized by a high technology content and a significant growth potential and have implemented a wide array of financial, economic and legal interventions tailored to the specific economic contexts (Buzzacchi et al., 2013; Wallsten, 2000; Irwin & Klenow, 1996). The rationales often advocated for these policies have been: 1) to influence domestic entrepreneurs' incentives and payoffs to create new technology based firms, thus setting the ground for new high-tech industries in the country 2) to attract innovative firms from other countries in order to strengthen the country's extant high-tech sectors.

Indeed, the phenomenon of born globals has encouraged policy makers not only to create the conditions to allow new domestic firms to be established in the country, but also to create the structural conditions to attract foreign growing companies in the country (e.g. Startup Visa). Setting the conditions to make a country attractive to internationally oriented small firms is a critical issue for host countries, because firms' internationalization flows are conditioned by a complex mix of out-selection factors which can constrain or boost firms' preferences for international operations. Out-selection factors are both associated with the host country conditions (such as the general state of the economy, the legal framework, the presence of incentive policies, the cultural background, the strength of bilateral political relationships, of bilateral trade agreements, of internal networks etc.) and with global dynamics and challenges (such as changes in currency values, stock market conditions, unnatural or natural events etc.). These issues are particularly relevant today, given that the increased openness of economies, the emergence of global players, the firms' need for new sources of competitiveness and the technological advances in communication, information and transportation which have drastically reduced internationalization costs, have been reshaping the business environment of firms. In this context, new technology ventures increasingly conceive internationalization as a process embedded in their overall growth path, no longer limited to sales activities, as theorized in the traditional internationalization models (Johanson & Vahlne, 1977), but

also to R&D and innovation activities (Granstrand, Håkanson, & Sjölander 1993; Brockhoff, 1998). Indeed, several innovative start-ups tend to adopt a global market vision from the beginning and undertake rapid internationalization process through exportation or other entry mode.

In recent years, the international business literature has offered insights on the internationalization dynamics of firms from two main perspectives. One main stream of research has focused on macro-economic analyses of bilateral foreign direct investment or export flows (Buckleyet al. 2007; Grosse & Trevino, 1996). Research in this area has examined the factors affecting the extent of trade between countries, looking at economic, cultural, political and juridical differences between host and home countries (Braunerhjelm & Svensson, 1996). The international operations of large multinational firms have been the main focus of such analyses. Instead, little is known about which factors enable a host country to be attractive for high-tech start-ups and which the most attractive countries are for such companies. The second stream of literature has investigated the modes and determinants characterizing the internationalization process of young and small firms. Under the assumption that this latter is substantially different from the one concerning multinational enterprises (Dimitratos & Jones 2005), this literature has examined the modes of entry, the timing (in relation to the development stage of the firm) and the scope of the international expansion of small firms. These papers have mainly focused on one particular country (Chetty & Campbell-Hunt, 2004; Kuivalainen et al., 2007; Zucchella et al. 2007), while the few attempts made to compare different experiences in several countries have mainly been of a qualitative nature (Gabrielsson, et al., 2008; Gabrielsson & Pelkonen, 2008). Cross-country quantitative survey research in this field of study is somewhat scant and limited by small sample sizes. The third paper appended provides an empirical attempt to understand the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries by examining in particular the role of host-country locational advantages (such as the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of protection of intellectual property rights), controlling for the host country competitive conditions, market size, similarity of socio-cultural environment and distance from the home country.

The theoretical foundation of the determinants that affect the location choice of a firm willing to internationalize its business goes back to the "eclectic paradigm" (also known as OLI model) developed by Dunning (1977). The "eclectic paradigm" developed by Dunning (1977) combines ownership-specific (O), location-specific (L) and internalization (I) advantages. Ownership advantages are firm-specific competitive advantages, resources or capabilities, location advantages refer to the specific institutional and economic endowments of host countries, internalization advantages refer to the firm's ability to manage and coordinate foreign business activities. Dunning (1977) suggests four major motives that drive foreign direct investments (FDI): market-seeking (e.g.

economy size), resource-seeking (e.g. availability of natural resources), efficiency-seeking (e.g. infrastructure quality) and strategic asset seeking (e.g. availability of strategic assets). Although Dunning's (1977) model applies only to FDI, it can provide some useful insights to interpret the location decisions of firms that internationalize through different entry modes. The model has been also employed to explain the internationalization of innovation activities by technology based firms (see Granstrand, Håkanson & Sjölander, 1993).

Among the dimensions which can characterize the attractiveness of a host country environment: the legal and regulatory framework, the dimension of the VC industry, the innovation capacity and the degree of intellectual property rights (IPR) protection. The legal and regulatory framework of a host country can heavily influence the easiness of starting and operating a business in that country. This is particularly important for small firms, which are endowed with limited financial resources and which face a harsh competition with larger and more experienced firms. Poorly designed business regulations, combined with weak legal institutions that protect property and investor rights, can become obstacles to doing business and more generally constrain economic growth and trade performance. A large body of evidence suggests that policy makers interested in attracting FDI in their country need to pay attention to the quality of business regulations, laws, institutional arrangements and to their enforcement (Alesina et al. 2005; Antunes & Cavalcanti, 2007; Freund & Bolaky, 2008; Barseghyan, 2008; Klapper et al., 2009; Naudè & Krugell, 2007). A business-friendly environment is more likely to attract the activities of foreign companies, because it generates the incentives to create jobs, to innovate and to increase productivity (Antunes & Cavalcanti, 2007; Klapper et al., 2009; Hornberger et al., 2011; Busse & Groizard, 2008). A favorable environment to set up a business is characterized by an adequate level of investors' protection and by a limited cost of enforcing contracts. Countries that can best create a welcoming environment for investors, in terms of protection and contracts enforcement, can attract greater and more competitive inflows of foreign companies. The strength of shareholder protection has been widely recognized to matter for companies, because it determines investor confidence in markets, it makes investment in firms to be less sensitive to financial constraints and leads to greater growth in revenues and profitability (Mclean et al., 2012; Shleifer & Wolfenzon, 2002; La Porta et al., 1998). High-tech start-ups, which are characterized by a low internal financial availability, often rely on external investors in order to acquire the necessary capital for their growth. These external investors, typically venture capitalists, are very concerned to preserve their investments from potential unfavorable rules which might apply in a different country. A legal system that provides timely and cheap procedures to resolve commercial disputes is crucial to attract the interest of foreign investors. In particular, it has been found that FDI are greater where the cost of contract enforcement is lower (Ahlquist & Prakash, A, 2010).

Another condition particularly relevant for high tech start-ups is the availability of equity capital. Venture capital indeed has traditionally been advocated to play a critical role for high-tech start-ups that find it difficult to access capital markets to fund their operations, finance their investment opportunities and sustain their growth. Financial constraints are particularly acute for innovative entrepreneurial firms because their investment returns are uncertain, they have little collateral to secure debt and they are subject to higher informational frictions (Carpenter & Petersen, 2002; Hall, 2002). A start-up might be interested in the presence of VC funds in target markets for two main reasons. First, start-ups that have not yet raised VC money in their home market might decide to move to other countries where there are more opportunities to secure VC investments in order to scale their businesses. Second, more mature start-ups could look for additional funding that the domestic VC market is not able or willing to provide. The evidence that more available venture capital allows for an increase in successful entrepreneurial activity (Kortum & Lerner, 2000; Bottazzi & Da Rin, 2002) has led many governments worldwide to implement programs to mobilize venture capital (Buzzacchi et al., 2013). Founders of start-ups that want to internationalize might consider moving into a country characterized by a greater availability of venture capital funding.

A host country's innovative capacity can represent another important motivation driving the internationalization flows of technology-intensive start-ups. This capacity reflects the conditions, investments, and policy choices that create the environment for innovation (e.g. the presence of strategic assets such as research centers and laboratories, skilled R&D personnel, high-quality universities, industrial district, brands and technology, etc.). The literature has identified two basic motives that drive technology-based firms' decisions to target countries characterized by innovative capacity (Kuemmerle, 1999; Le Bas & Sierra, 2002; von Zedtwitz & Gassmann, 2002). First, according to the "asset exploiting" arguments, firms are interested in promoting the use of their technological assets/products in markets that are receptive to innovation and technological advances. Indeed, the responsiveness of customers to innovations is an important element of location attractiveness. Obviously, some level of modification to the company's products or processes may be required in response to local demand conditions (Dachs & Pyka, 2010; Criscuolo et al., 2005). Second, an "asset augmenting" strategy is followed when the innovation system of the foreign location allows firms to absorb and acquire technological capacities, spillovers, or other location-specific technological advantages that are not available at home (Dunning & Narula, 1995; Kuemmerle, 1999). According to this view, establishing a presence abroad responds to the firm's need to augment its existing stock of knowledge by seeking advantageous locations where complementary competencies are available. Finally, other studies examine the links between R&D, internationalization and post-IPO growth in the United Kingdom, Germany and Italy, with differences explained by institutional infrastructure. At the same time, some of their patterns are

consistent across institutional context (Filatotchev and Piesse, 2009). This study also finds that R&D intensity is an important antecedent for internationalization of sales.

A related issue derives from the intellectual property rights system. Intellectual property rights protection has a decisive influence on the internationalization trajectory of high-tech firms. If firms engage in R&D and innovation activities in the host country (even if by simply adapting existing products to the local market), the results of these activities may only be protected at the host country patent office (Dachs & Pyka, 2010). IPR protection is relevant for all manufacturing sectors, and increasingly for information technology sectors, whose investments are also sensitive to property rights risks (Jandhyala, 2012). It follows that strong IPR protection should attract foreign direct investments, large volumes of licensed technology and favor international technological collaborations, since it limits the possibility of the threat of imitation (Maskus & Penubarti, 1995).

The third paper appended will contribute to this literature by providing a framework on the locational determinants of internationalization for high tech new ventures.

3 RESEARCH METHOD

This chapter provides a description of the research methodology used to achieve the goals of the research study. It begins with the discussion of the research approach and design. It then reviews the research strategy, the data collection process, the data analysis, research methodologies and quality assessment. Finally, an overview of the methodological choices for the different papers is illustrated.

3.1 Research design

The aim of scientific research is to provide objective descriptions and interpretations of real world phenomena. Objectivity is a key feature that distinguishes scientific research from any other types of interpretation of reality and it is achieved by means of scientific methods. Objectivity indeed is achieved when the researcher is able to separate evidence, data and conclusions from his/her own subjective perceptions and, on the basis of logic and reasoning, to provide an approximation of the real world (Longino, 1990). Scientific research allows the description of both observable and unobservable phenomena; the latter are explored by means of scientific techniques and methods.

Theory building in scientific research is a process characterized by a tentatively approach, indeed phenomena evolve in nature and corresponding theories are likely to be adjourned if more credible explanations, supported by empirical studies, appear. Hence scientific research is always based on existing theories, constructs and relationships and the aim of researchers is to build, develop new theories and new empirical findings based on existing theories so to contribute to the scientific progress.

This study is built on several premises. The observation of the events led to the definition of constructs and relationships as an approximation of the reality observed. After that, through the use of suitable methods and techniques, an understanding of how dimensions related to the entrepreneur, i.e. the firm and the home country influence new ventures' choise of early internationalization, can be achieved. Results from the analysis provide evidence showing that the entities under investigation exist in the real world and that it is possible to expand the knowledge about them based on prior theories.

Several are the methods and techniques available to researchers and the selections of the most suitable method(s) is based on the nature of the phenomena under investigation and on the research questions the researcher aims to address. In this study both qualitative and quantitative methods are

used in order to explore the phenomena through two different and complementary approaches and to provide a comprehensive and more accurate explanation of realities (Denzin & Lincoln, 2000).

In the first step of the study a qualitative approach was used. A qualitative approach is appropriate when the research questions are "how" questions and when the main aim is to develop deep knowledge and understanding of a particular phenomenon under investigation (Neuman, 2003; Yin, 2003). The goal of this first analysis was to achieve an in-depth understanding of the reasons that lead entrepreneurs to start a born global company. A first qualitative study was necessary to understand the phenomenon in its complexity so to build the most appropriate constructs and the relationship, and then to build and then test theories with a quantitative approach; hence the first part of the research used an inductive approach. However the qualitative study was anticipated by a first iteration of literature review which provided a first pre-conceptualization of reality. The literature review supported the formulation of questions and the development of a first understanding of the born global phenomenon.

The findings from the qualitative study in combination with the literature review were used to develop a research model, which was then used to perform the core research using a quantitative approach.

The quantitative approach focused on testing the hypotheses previously built through statistical techniques, so to provide generalizations regarding the phenomenon under investigation. Contrary to qualitative studies where large amounts of detailed data are gathered from few cases, a quantitative approach facilitates the generalization of results based on data gathered from a large number of entities.

In this study, the interrelationships among entrepreneurial opportunity, the entrepreneur, home country characteristics, firm, network relationship and internationalization were designed, hypothesized and tested over a statistically significant population. This second part, which originates the second and third paper appended, followed a deductive approach as it involves theory testing, i.e. setting hypotheses based on theory and then testing them using quantitative method (Yin, 2003).

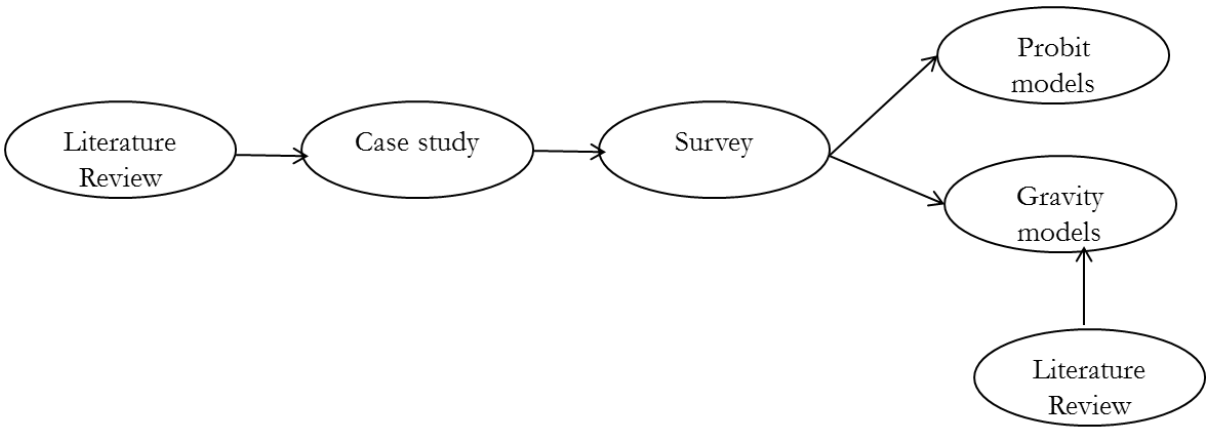
As mentioned earlier, before engaging in the first qualitative study a comprehensive literature review and search was conducted to obtain an in-depth understanding of the main existing theories related to the research topic. Beyond the literature review, doctoral courses (e.g. Contemporary Entrepreneurship Research, Technology and Innovation Management, etc.) were also crucial to acquire relevant knowledge about the theoretical basis. Three iterations of literature reviews were needed to develop this study. The first was a more general literature review to acquire the basis on entrepreneurship studies and on existing theories and results of international entrepreneurship research; the second iteration concentrated on the phenomenon of born global start-ups, main focus of the thesis. During these two iterations studies from management, entrepreneurship, economics,

policy and finance journals where considered. The last iteration concentrated on the topic of internationalization flows, hence quite different journals more linked to international business, economic geography and economics of innovation and technology were taken into account. Some of the successful keywords at the basis of the literature search are the following:

- Entrepreneurship, international entrepreneurship
- Born globals, born global companies
- International start-ups
- International flows, international trade

The literature search resulted in more than 200 articles and book chapters, and further material was found using the reference lists from the articles that were first identified. Finally, the participation to conferences allowed getting access to other articles interesting for my research.

Figure 6. Research design process



3.2 Research strategies and data collection

The choice of the research strategy is based on three conditions: first, the type of research questions; second, the extent of control an investigator has over the actual behavioral events to be investigated; and third, the degree of focus on contemporary, as opposed to historical, events (Yin, 2003). Based on these conditions, a case study research strategy was selected for the first part of the study as the focus was to describe and explain a complex real-life phenomenon, with unclear outcomes. This was followed by a survey study, which had the purpose of testing hypothesized relationships based on a large sample of data so to generalize results. The next sections provide detailed explanation of the specific methods and techniques used for the segments of the research.

3.2.1 Case study

The first segment of the research was addressed through a qualitative study approach. This part used an exploratory research design approach; explanatory designs are helpful to obtain basic knowledge about an issue. This design is also appropriate when the relations concerning the issue are new and unknown; methods suitable for this design usually include interviews, focus groups and case studies.
In order to identify how the internationalization path followed by the firm is affected by age-related drivers and provide further qualitative evidence to the literature background presented in section 2.3, a multiple exploratory case-study method was chosen as a basis to build theories around the concept of the young entrepreneur (Corbin and Strauss, 1990; Eisenhardt, 1989; Yin, 1989; 1998; Maxwell, 1996; 1998). Moreover, a multiple rather than a single case study approach was chosen in order to analyze pattern-matching properties between the cases analyzed (Rialp et al., 2005). In order to assure the validity and reliability of the research, design and analytical requirements were followed (Yin, 1994). First, a protocol following the literature review was defined prior to the interviews phase (see Appendix 7.1.1); each company was interviewed following the same defined structure specifically built for the research. Then, as a requirement to ensure construct validity, multiple sources of evidence were used.
Data collection involved two main sources: semi-structured interviews with entrepreneurs and multiple sources of secondary information, e.g. corporate documents, websites and press releases, which provide more accurate and unbiased information. Moreover several data about the industry and the market in which firms operate were collected from articles, websites and company documentation. Relying on different sources of information allows data triangulation to ensure the validity of the study and to obtain a more comprehensive and accurate view of the topic analyzed. To guarantee the reliability of the study, a database with all the available documents, interviews transcripts and reviewed documentation was built. The interviews were recorded. All the interviewed companies are mentioned with their actual name and location. Although it is usually difficult to assure the external validity, meaning the possibility to obtain statistical generalization inferring conclusions about a population through the case studies analyzed, a multiple case studies approach was adopted gathering also details on the industry context, business model and financial data of the companies.
Data collection. Interviews were open-ended and semi-structured (from 60 up to 90 minutes as an average) at the executive level (founder, CEO). The interviews were conducted during the period June to August 2011 in San Francisco at the companies' headquarter or local office. The survey investigated the previous experiences of the entrepreneur, the history of the actual company, the fund raising activity, the business model of the company, the internationalization process and the

future goals. Detailed notes were taken and minutes of the interviews were sent back to the respondents a few days after the interview. The targets of the study are high-tech companies that showed an international expansion since the first phases of their life cycles (within 3 years). For this reason, six criteria were identified in order to select the case to be analyzed: small size companies at the time of their first international operations (less than 20 employees); high-technology companies since, as reported in literature, the BG phenomenon is mostly widespread among high tech industries; early internationalization, export activities or international office within 3 years from the establishment; recently founded companies, year of establishment no earlier than 2000. Companies founded in the same period were selected in order to reduce the potential impact of general market and technology trends. Moreover, since the geographic focus is on Italian start-ups, companies founded by entrepreneurs coming from Italy were chosen. The sample of firms thus obtained is presented in table 2.

For each company the set of interviews was then followed by the design of a Canvas model (Osterwalder, Pigneur, & Smith, 2010), in order to get a comprehensive overview of the business model of the company, the industry and the stakeholders influencing the firm. Moreover a key activities template was filled for each company, in order to understand the determinants and results of key activities location.

Table 2. Description of the cases analyzed

Startup	Sub-sector	Revenue/ month	Number of employees	Years of activity	Total external funding
Fluidmesh	Software/hardware	$100K-1000K	10-20	5-10	$1M-5M (US VCs)
Funambol	Software	Undisclosed	>50	5-10	>$25M (US VCs)
Hyperfair	Web	$10K-100K	10-20	1-2	Bootstrapping
Mashape	Web	$1-1K	1-5	1-2	$1M-5M (US VCs)
Neptuny	Software	Undisclosed	>50	5-10	$100k-1M (Italian VCs)
Risparmio Super	Web	$10K-100K	10-20	1-2	$100k-1M (Italian VCs)
Spreaker	Web	$1K-10K	5-10	1-2	$1M-5M (Italian VCs)
Twimbow	Web	Pre-revenue	1-5	1-2	Bootstrapping

All the considered firms are high-tech based. Most of them are web-based, sometimes including mobile services (Spreaker and Twimbow). Coherently, the younger companies (1-2 years from establishment) present a lower number of employees, between 1 and 10, while the older (5-10 years) present a larger number between 20 and 50; they all have raised funding, either in Italy or in United States, except for Hyperfair and Twimbow.

Upon completion of each interview, the voice recordings were transcribed into a text format, resulting in 150 pages of textual material. The textual material was coded by identifying four categories: quantitative information (to be checked with information gathered from external sources), emotions and feelings, experiences and activities, network and people. Grouping the information into these four categories allowed us to design a cross-cases analysis across the dimensions we wanted to analyze (financial needs, emotional attitude, previous experience and social capital).

The conclusions and suggestions are directly driven from the findings related to case studies. This chain of causal arguments assures the internal validity or also called logical validity.

3.2.2 Survey research

As discussed in the previous sections, a quantitative approach was chosen for the second part of the study. This approach was chosen in order to test the hypothesis at the basis of the theory developed so to provide generalization of results. Moreover, conducting a survey after doing case studies and literature searches also enhances the research design (e.g. Eriksson, 2007). Case studies provide detailed knowledge about the topic under investigation and combined with the literature search can be used to develop a comprehensive research framework for a survey study. The survey approach is at the basis of the second and third appended papers, as their goals was to test hypotheses and models. In the following section, the sample selection criteria, the data collection process, and the details of the measurement of variables are presented.

Data and sample design

The basic data and e-mail contacts for the surveyed companies have been extracted from CrunchBase, a free high technology companies and investors database with global geographical focus. CrunchBase is operated by TechCrunch, one of the most popular Internet blogs on technological innovations, which is located in the Silicon Valley (California). The dataset is quite new and it shows a good potential for research purposes. The dataset can be found at http://www.crunchbase.com/.

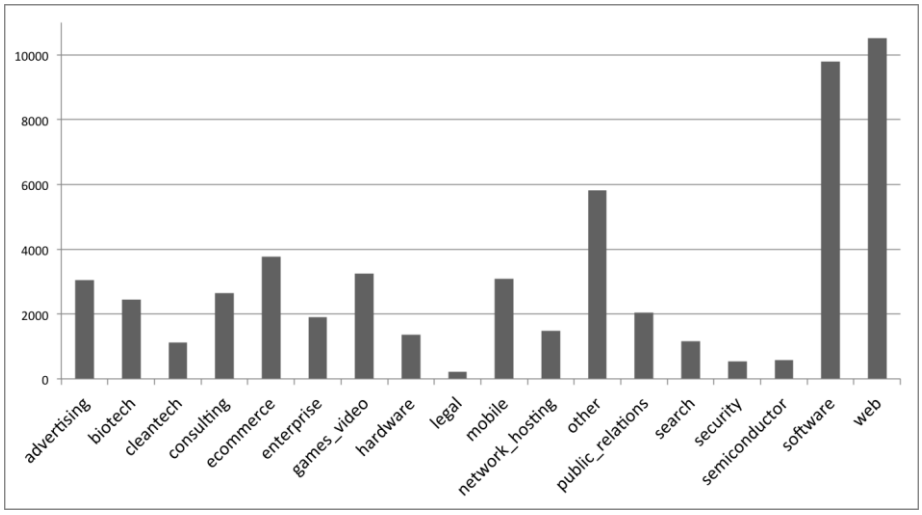
CrunchBase is a wiki website, i.e. a website that allows its users to add, edit or delete contents through a web browser, typically using a simplified markup language or a text editor online. A wiki database presents several advantages for internet users; however, the main specific advantages to researchers are the real time updated information and the possibility to access information coming from a wider geographical area. Nevertheless, a wiki database has some clear disadvantages for scholars, first and foremost the limited reliability; indeed since everybody can edit the information,

those could be not reliable or false. Hence, it is essential for researchers to match information derived from a wiki database with some other official sources of information.

At the time of the survey design, in December 2011, the database was composed by 70'985 start-ups. For each company registered the database collects three types of information: general information of the company (name, number of employees, establishment year, category, description); financial information (rounds of investments received, money raised for each round, date for each round of fund raising) and contact information (e-mail, phone number, website).

The industries prevailing among the start-ups in the database are the web and software sectors covering 37% of the total number of start-ups, followed by e-commerce (7.6%) and games and video (7%).

Figure 7. Industry distribution of the startups in the CrunchBase database



*Data as of December 2011

Concerning the financial situation of the firms in the database, 21% have raised equity capital at the time of the survey planning (December 2011) for an average of 1 million USD dollars and a total amount of 230 billion USD dollars. Breaking down the data to each equity round, the average seed round consists of 80'000 USD dollars.

The sample was designed in order to include those companies representative of the target population. A first selection recurs at the industry level. In particular, companies operating in the following sub-fields (according to the CrunchBase categorization): advertising, e-commerce, enterprise, games and video, mobile, network hosting, search, security and software were included in the sample. The rationale behind the choice of the ICT and electronics sectors is that born global strategies tend to emerge most clearly in industries in which global competition predominates, such as the ICT sector (Chetty & Campbell-Hunt, 2004). Moreover, due to the retrospective nature of the

study, companies founded before 1995 were excluded in order to ensure that there was sufficient corporate memory to provide an accurate recalling of the circumstances surrounding the first internationalization decision. In addition, the phenomenon of born globals has only started to spread internationally over the last 15-20 years (Jones, Coviello, & Tang, 2011).

This resulted in a sample of 38,585 start-ups located worldwide. Firms with missing information on e-mail addresses were excluded, thus a reduced dataset of 16,921 firms was obtained. Being the focus of the research on international start-ups, the sample was restricted only to internationalized firms. The criterion chosen to define a firm internationalized is the presence of at least one office in a country different than the home country; this screening was conducted checking the information of the headquarters and other offices available in the CrunchBase database with the information available on the firms' websites. This criterion was chosen in order to avoid the selection of non-internationalized start-ups in the sample; on the other side the entry mode of a start-up in a new country could be lighter than opening a new office, hence this criterion would exclude some of the start-ups which have international activities but have decided to use a light entry approach in new markets. However it is important to consider that in order to provide to the potential new customers a feeling of closeness, start-ups tend to provide the information on the presence in that particular market also if they have only a simple desk in an incubator or co-working space in that new country; as consequence the criterion used is likely not to exclude start-ups with international activities organized through a light entry mode. This last operation led the sample to be further reduced to 2,604 companies. The sample consists of 47 countries: Argentina, Australia, Austria, Bangladesh, Belgium, Luxembourg, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Ireland, Israel, Italy, Japan, Lebanon, Lithuania, Netherlands, Nigeria, Norway, Poland, Qatar, Romania, Russian Federation, Serbia and Montenegro, Singapore, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, United Kingdom, United States of America, Uruguay.

Web-based Survey Instrument

The appropriate design and implementation procedure play a relevant role to determine the response rate (Dillman, 2000); however the nature of the survey plays a critical role too, hence it is essential to understand which the advantages and disadvantaged of the different instruments available to conduct a survey are.

The diffusion of the Internet has increased the relevance of electronic-based tools to realize survey (Couper, 2000). Given the several documented drawbacks of using paper-and pencil surveys, it is not surprising that many researchers exploit web services to conduct survey research (Klassen & Jacobs, 2001). Dillman (2000) argued that the electronic survey methods have "the potential for

bringing efficiencies of comparable importance to the design and administration of self-administered questionnaires" (p. 352). There are two categories of electronic survey methodologies: e-mail and web-based surveys (Sue & Ritter, 2007). In the web-based survey, respondents are directed to a website, where the survey is stored; several are the free web-based survey tools available today. Advantages include the fast delivery and response, low costs and anonymity guarantee (Jansen et al., 2007). The e-mail survey is characterized by the presence of the survey either in the body of the e-mail or as an attachment. Although the two tools have similar benefits, one major drawback of the web-based survey is that anonymity is often not possible, as the researcher can see the e-mail addresses of the respondents, which may negatively impact on the response rates (Sue & Ritter, 2007).

In addition, the web-based survey allows for more customization in terms of visual appearance and layout/design; moreover it allows for more interactive features e.g. the "jump questions" (Griffis et al., 2003). Moreover, the administration of the survey and data entry is facilitated in web-based surveys. Indeed, response rates can be easily tracked and the survey responses are captured and stored directly through the server, which minimizes the errors that may result from manual data entry of email questionnaires (Sue & Ritter, 2007). Nonetheless, web-based surveys have some drawbacks too; technology problems such as a crash on the website where the web-based survey is stored may interrupt the respondent and this incident might lower eventually the response rate (Jansen et al., 2007).

Concerning response rate, which is one of the most critical aspect of a survey research, while some studies found higher response rates for web-based surveys (e.g., Griffis et al., 2003), mail questionnaires seem to have a higher response rate than web-based surveys according to other researches (Shih and Fan, 2008). Shih and Fan, 2008 found that the heterogeneity of results may depend on the target population; for instance they found that college students as the target population seem to prefer web-based surveys rather than mail questionnaires.

To conduct the survey I decided to adopt a web-based instrument rather than a traditional email survey because it allows an increased response speed and because the target population, entrepreneurs in the ICT sector, has a high familiarity with web technologies. Accordingly, the coverage bias is likely to be minimized since the target population is familiar with the web and can be considered technology savvy.

Structure of the Questionnaire

The questionnaire electronically sent to respondents can be divided into three sections. The first is the “General Information” section, where respondents were asked name, year of establishment of the firm, home country, and industry category. In order to test the reliability and validity of data

some of the information available on the CrunchBase database was asked to respondents. The second part is the "Internationalization" section which contains questions on the number of countries the start-up is involved in, the order of entry and the timing of internationalization, and questions gathering the perceptions of the entrepreneurs on the importance of several factors that drove their internationalization choice. Finally, the third section analyzes the human capital of the start-up, by asking questions about the entrepreneur and his/her co-founders. Questions included in this section are related to the age of the entrepreneur/co-founder, his/her level of education, previous education or working experience abroad and known languages.

According to the variables to be collected, different typologies of questions were asked and different scales used, such as nominal, ordinal and interval scales and ratio scale. Finally, since the design of the questionnaire is essential to increase the response rate, a user friendly structure was designed. The complete questionnaire is exhibited in Appendix.

Survey Administration and Data Collection

To create the online survey the instrument selected was Google Survey, a free tool provided by Google Inc. that allows creating and managing surveys very easily and with a user friendly design. Responses to the questionnaire are automatically collected in a Google spreadsheet; this automatism reduces the human errors related to transferring the responses.

Questionnaires were sent out electronically over the period December 2011 - February 2012 period. The first round of emails was addressed to CEOs of firms (the entrepreneurs) and it was sent on December 18th, recipients were asked to answer within January 15th. A follow-up was undertaken by sending reminders to those who had not responded after 6 weeks from the first mailing. The respondents were assured confidentiality. A total of 522 responses were gathered, yielding an effective response rate of about 20%, which is in line with previous studies in the field (Knight & Cavusgil, 2004). In order to increase the response rate, the communications were sent personally to each recipient so to avoid the email to be directed towards the spam folder. Moreover the survey was accompanied by a cover letter explaining the goal of the survey and assuring respondents a summary of results would freely be provided to them. Finally anonymity was assured.

Non-response bias was checked on a number of variables based on the notion that late respondents would be more similar to non-respondents than earlier respondents (Armstrong & Overton, 1977). The results showed that the non-response bias was minimal, with respect to all the questionnaire items. February 28th was the deadline to receive answers from the second round of emails. Once all the information was gathered, preliminary data cleaning, naming and codification were performed.

The distributions of companies respectively across countries and sectors are presented in Table 3 and Table 4.

Observations with missing values in the variables used in the empirical analysis were dropped, and the sample was thus reduced to 445 companies.

Table 3. Frequency distribution of sample firms across different geographical areas

Geographical Area	Entire sample	
Europe	216	48.54%
North America	126	28.31%
Asia	60	13.48%
Central and South America	28	6.29%
Oceania	10	2.25%
Africa	5	1.12%
All countries	445	100%

Table 4. Frequency distribution of sample firms across different sectors

Sector	Entire sample	
Advertising	32	7.19%
E-commerce	39	8.76%
Enterprise	16	3.60%
Games and video	19	4.27%
Mobile	48	10.79%
Network hosting	5	1.12%
Search	9	2.02%
Security	7	1.57%
Software	155	34.83%
Web	115	25.84%
All sectors	445	100%

3.3 Research Methodology and quality assessment

3.3.1 Measures operationalization

The questionnaire included a variety of different questions and scales. Many of the questions were measured on five-point Likert scales ranging from "not important" to "very important"; other questions were descriptive (e.g. level of education, period of internationalization etc.) and finally the questionnaire included also direct questions (e.g. year of establishment etc.). The questionnaire included several questions, and some of them were not included in the study but will be available for future research.

The detailed descriptions of the independent variables used in this study can be consulted in the appended papers, whereas the main dependent variables are described below.

Born Globals: While a precise and universally accepted set of definitional criteria for a firm to be classified as a born global does not exist, it was decided to use the definition originally suggested by Knight & Cavusgil (1996) and which has been extensively employed in other studies (Jantunen, et al., 2008; Knight & Cavusgil, 2004; Moen, 2002). Consequently, firms that started their foreign operations within 3 years of inception and which have derived at least 25% of their revenues from exports were categorized as born globals. Out of 445 firms, 267 met these criteria and were classified as born globals (BGs) (60%), while the remaining 178 companies (40%) were categorized as other internationalizing companies (OICs).

Degree of Born Globalness: As suggested by Kuivalainen, Sundqvist, & Servais (2007), the definition of born global considers the time and scale of internationalization, but not the global reach a firm has in its operations. A group of born globals can include firms with different degrees of internationalization: while some firms quickly diversify geographically, others might have operations only in a few countries. Hence, a distinction was made considering the scope of internationalization. Two categories were identified based on the upper quartiles of the distribution of the number of countries involved. Firms falling in the top quartile of the distribution (10 or more than 10 countries involved) were classified as born globals with a high degree of born-globalness (BGs_H), while firms targeting less than 10 countries were classified as born globals with a low degree of born-globalness (BGs_L). Out of 267 BGs, 150 (56.18%) were BGs_H and 117 (43.82%) were BGs_L. These three variables, BGs, BGs_H and BGs_L, are the dependent variables at the basis of the analysis of the second paper appended.

Flow intensity: The intensity of the internationalization flow from country *i* to country *j* (FLOW_INTENSITY) is measured by the number of firms established in country *i* which chooses to enter country *j* as a first country of entry. This variable is the dependent variable at the basis of the analysis of the third paper appended.

3.3.2 Method and analysis

Regression model

A set of probit models was run to test the determinants that affect the probability of a start-up internationalizing from its inception and that a born global widely diversifies geographically. The models derive from the theoretical model designed to include extent, speed and scope of early internationalization. According to this model, speed and the extent are enabled by technology, motivated by competition, mediated by the entrepreneur's perceptions and moderated by the knowledge intensity of the opportunity and a firm's international networks. The process that leads a

firm to start internationalizing at its inception begins with a potential international entrepreneurial opportunity. The extent to which the international entrepreneurial opportunity is recognized, evaluated and exploited depends on a number of conditions (both exogenous and endogenous to the firm), which in the model have been grouped into four main categories: home country conditions, entrepreneur, network relationships and firms' attributes. These dimensions can exert various degrees of pronounced effects on the born globals, according to their degree of born-globalness. Hence, some variables have been included into the regression models to account for each of the five categories. To measure the home country conditions the variables used are market size, competition, equity financing, industry dynamism, innovation and appropriability regime; to account for the entrepreneur dimension, his/her age, education, knowledge of foreign languages, international experience, industry experience, period of study abroad and his/her international commitment. For the firms attributes the variables are niche orientation, scalability of the product, the team competences and its size. Finally the network relationship dimension has been measured by the social capital of the entrepreneur. For a complete list and description of the variables included into the model see the Appendix of the second paper appended.

Time, country and industry dummies were included in each model, as well as controls for the state of the stock markets, for the national legal conditions and for the entrepreneurial propensity of the country at the internationalization year. In addition, the hypotheses were tested on sub-sample of born globals in order to investigate the impact of the identified variables on the probability that they show a high degree of born-globalness. The probit models have been estimated with Stata11.

Gravity model

In order to explore the determinants of the intensity of internationalization flows of high-tech start-ups between pair of countries a modified gravity model was adopted. The gravity model has been largely employed to explain bilateral trade flows (see De Benedictis & Taglioni, 2011 for a review), as increasing in their economic size and decreasing in their distance. Gravity equations have been applied to explain other types of relationships between countries, such as trade in services (Ceglowski, 2006), knowledge flows through patent citations (Peri, 2005), internationalization of inventive activities (Picci, 2010) and immigration flows (Lewer & Van den Berg, 2008). Several studies empirically demonstrate that distance negatively influences bilateral flows; Disdier and Head (2008) performed a meta-analysis on 103 papers applying the gravity model and he finds that on average, bilateral trade is nearly inversely proportionate to distance. Distance is a wide concept which includes not only spatial or geographic distance, indeed several scholars have measured economic distance, technological distance, psychic distance measured by language dissimilarities, cultural and religious commonalities and colonial links, industry distance as distribution channel

differences, industry structure differences and common currency area (e.g., Rose, 2000; Baldwin, 2006; Dow & Karunaratna, 2006; Ganesan et al., 2005; Ghemawat, 2001; Hallén & Wiedersheim-Paul, 1979; Linder, 1961; Luostarinen, 1980; O'Grady & Lane, 1996; Posner, 1961; Ronen & Shenkar, 1985; Vahlne & Wiedersheim-Paul, 1973; Vernon, 1966) and level of mutual trust (Guiso et al., 2009). Among these concepts, spatial, economic, cultural, and psychic distance are the most commonly measured distance determinants in literature (Brock, 2011).

Although the gravity model has traditionally been applied to explain trade in goods, other relations between countries have been described through this model; Ceglowski, 2006; Kimura and Lee, 2006 analyze the trade of services, Blum and Goldfarb, 2006 the trade through the web; Peri, 2005 and Picci, 2010 the knowledge flows through patent citations; several authors study the immigration flows (Lewer and Van den Berg, 2008).

In the modified model, used for the purpose of this research, the dependent variable is represented by the intensity of the internationalization flow from country i to country j (FLOW_INTENSITY), measured by the number of firms established in country i which choose to enter country j as a first country of entry. Internationalization flows between pairs of countries are assumed to depend upon a set of destination-specific variables that affect the attractiveness of country j, distance measures and bilateral "linkages" between the two countries.

Distance effects are estimated as a parameter in the gravity equation. The model incorporates geographical as well as cultural distance between host and home country as explanatory variables. Four different measures of geographical distance were included in the models to test for their robustness. A first measure refers to the latitude and longitude of the most populated cities, a second measure refers to the latitude and longitude of capital cities, a third measure is a weighted (by the share of country population) measure of the distances of the most populated cities. In order to account for the importance of differences in time zones in affecting business transactions (Stein & Duade, 2007), the variable TIME ZONE, which measures the time difference in hours between the capital cities of countries *i* and *j,* was also included. This variable ranges from 0 to 12.

While most of scholarly works have found a persistence negative effect of distance on bilateral trade flows[2], it is quite likely that this effect is not fully explained by transportation costs alone. It could well be that what really matters is a broad concept of distance, which also includes socio-cultural distance. The similarity of the socio-cultural environment between two countries has been identified to be a critical dimension in explaining trade flows; it can have a profound impact on market access, on consumption patterns and on how business is conducted (Kogut & Singh, 1988; Fletcher &

[2] Performing a meta-analysis on 103 papers applying the gravity model, Disdier and Head (2008) show that distance negatively influences bilateral trade flows. The authors thus challenge the idea that distance is becoming less relevant with globalization and with advances in information and communication technologies.

Bohn, 1988). Hence the role of socio-cultural distance was measured through a vector of linkage variables identifying country pairs with a common language, a common legal origin and a past colonial link.

The masses of the law of gravity of the traditional gravity model were substituted with the market size for country *i* and *j*, measured by the level of GDP. The size of the target market is generally regarded as a main driver of the decision of firms to start operating in a foreign country. Large foreign markets allow firms to realize economies of scale in production/sales and offer a greater potential for growth and profit. Since large markets tend to attract global competition, firms that are excluded from these markets are competitively disadvantaged (Porter, 1980). Moreover, firms can use larger markets as a base to export to smaller markets in the region (Krugman, 1980). It has been generally found a positive relationship between investment attraction and the market size/potential of the host country (Blonigen & Piger, 2011; Buckley et al., 2007; De Beule & Duanmu, 2012).

Finally, a set of control variables are included in the model, the average cost to export for the home country was included in the model, because a high cost to complete the procedures to export might hinder the international orientation of a financially constrained start-up. A control for the competitive conditions in the host country environment looking at the total amount of foreign direct investments (FDI) and of exports was included. Finally, country dummies (both for country *i* and *j*) were included in all specifications in order to control for unobservable differences between countries (e.g. macroeconomic and political stability).

3.3.3 Quality assessment

To assure the overall quality of the research study trustworthiness, validity and reliability need to be accurately considered.

Trustworthiness can be enhanced through triangulation of theory, method, measurement and observers (Neuman, 2003). Triangulation of theory is achieved through the use of different theoretical lenses during the research design phase and for data interpretation; this study is based mainly on entrepreneurship literature, however innovation and technology management and management literature contributed to shape research hypothesis and to provide explanations for results achieved. The triangulation of method is achieved through the use of different type of methodologies i.e. qualitative and quantitative methods. In this study the use of qualitative method in the first place and then the use of quantitative method allowed triangulation of methods.

The triangulation of measurements was assured by the use of multiple measures for the same phenomena, e.g. for the qualitative study interviews and documentation were used as different measurements, and for the survey, variables were measured with two or more items each; moreover in the gravity model four different measures for the variable *distance* were used Finally the

triangulation of observers was guaranteed by the collaboration with other researchers in the design, execution and analysis of the research which resulted in the presence of co-authors in the papers appended.

Validity addresses the issue of ensuring that what is measured is what was intended to be measured. Construct, internal and external validity were taken into account in the study. Construct validity is achieved when theoretical concepts under study are operationalized and measured in the correct way (Yin, 2003, Hair et al., 2006). In this study construct validity was obtained by relying on well-established measures from literature (e.g. born globals) which have already been empirically tested for stability. Internal validity concerns the establishment of accurate causal relationships (Hair et al., 2006). This study ensured internal validity by relying on existing relationships in previous studies between the entrepreneur, firm and home market characteristics and the choice to born international. External validity is related mainly to the generalization of results, and it is achieved if the sample has a sufficient size and it is representative of the target population. The respondents to the survey in the current study (more than 500) represent a sufficient number to allow the generalization of results to the entire population of high-tech start-ups. In addition, no major indication of irregularities found between responding and non-responding firms were found. Finally, since the survey addressed firms across several countries, the results can be applied to start-ups no matter their specific country.

Table 5 sums up the methodological approaches chosen for the three appended papers.

Table 5. Methodologies overview for the appended papers

	Paper I	**Paper II**	**Paper III**
Research Approach	Qualitative	Quantitative	Quantitative
Research Strategy	Case study	Survey research	Survey research
Data Collection	Interviews, documentation	Questionnaire	Questionnaire, public databases
Data Analysis	Case study analysis	Regression analysis	Gravity model, regression analysis.
Dependent variable	Born global company	Born global company	Intensity of internationalization flows

4 SUMMARY OF RESULTS IN APPENDED PAPERS

The thesis attempts to provide a comprehensive framework on the phenomenon of early internationalization of high tech start-ups, focusing first on the firm dimension and on the reasons why entrepreneurs internationalize early and second, on the country dimension and on the determinants that affect internationalization dymanics. The research originates three papers; the first two papers focus on the antecedents of the choice to build a born global firm, hence they contribute to the international entrepreneurship literature and provide empirical evidence of the BGs phenomenon; the third paper is based on the international business literature and it provides empirical evidence on the characteristics that makes a country attractive for foreign investments, however the novelty of this paper stands in the focus on high tech start-ups rather than on traditional multinational companies.

4.1 Paper 1: Born global companies founded by young entrepreneurs. A multiple case study

G. Cannone, A. Pisoni, A. Onetti. Born global companies founded by young entrepreneurs. A multiple case study. *International Journal of Innovation and Entrepreneurship Management* (forthcoming).

This paper provides further evidence of the phenomenon of Born Globals through an exploratory multiple case studies of eight born global companies founded by young entrepreneurs. The study is based upon an in-depth qualitative analysis on eight start-ups founded by Italian young entrepreneurs that showed an early internationalization towards the United States.

This paper contributes to the entrepreneurship literature by exploring the born global phenomenon under the young entrepreneurship lenses through an exploratory multiple case studies of eight BGs founded by Italian entrepreneurs.

Results show that the lack of financial resources for young entrepreneur seems to be a triggering factor for starting a born global company since the paucity of financial resources spur young entrepreneurs to move to those countries where there is a larger availability of equity capital for start-ups (specifically United States and in particular the Silicon Valley). Indeed results confirm that young entrepreneurs are perceived as less reliable from financial actors since they lack a track record as entrepreneurs (Stevenson, 1987) or collateral assets. However they seem to be aware they need to compensate credibility by showing investors they believe in the company and they have the ability to

execute the project. Moreover, the lower risk perception and the lower commitment towards family seem to facilitate the ability to start born globals, by allowing young entrepreneurs to be more prone to mobility.

The access to different business networks and previous knowledge and experience accumulated by the entrepreneurs seem to be the real enablers of born global companies. All the entrepreneurs interviewed stressed the relevance of leveraging a wide and qualified business network and the prior experience they accrued, both as entrepreneurs, students and workers. Periods of study/training (Fludimesh, Funambol, Hyperfair, Spreaker, and Risparmio Super) and working abroad (Funambol, Twimbow) is frequently mentioned. The previous knowledge and experience of the founders in the same business segments is not confirmed as equally important. This factor is mentioned by some firms (Twimbow, Hyperfair, Fluidmesh), but they refer mostly to a generic experience in the industry and not to a specific knowledge of the business. Hence a prior experience abroad (not necessarily as entrepreneur in the same business/segment) seems to trigger a venture with a stronger and earlier internationalization. Moreover, there is a strong correlation between the place where the prior experience took place and the areas of internationalization of the firms (Fluidmesh, Funambol, Hyperfair, Risparmio Super, Spreaker, and Twimbow). An important finding, for the perspective of the young entrepreneurship is that, although young, entrepreneurs seem to be willing to heavily invest and capitalize on building their own network; this result may be explained by the urgency and the relevance to access to external resources through business networks since they lack internal assets (McDougall et al., 1994; Zain and Ng, 2006; Laanti et al., 2007).

Concluding, the multiple case analysis highlights how the limited financial resources for young entrepreneurs seem to be a triggering factor for them to adopt a born global approach. It confirms that the paucity of owned assets spurs young entrepreneurs to access to resources in those places/countries where there is a more developed venture capital industry.

Moreover, results highlight the importance of professional networks built by entrepreneurs before establishing the company. In particular, consistently to McDougall et al. 1994, the study points out how networks helped founders of born globals to recognize and exploit international business opportunities. Most importantly, although social capital increases with age, given the relevance of this factor to start a BGs, young entrepreneurs seems to invest heavily into widen their social network and countervail the young age effect. Moreover, the prior experience abroad (either as entrepreneur or as employee or as undergraduate or graduate student) triggers and shapes the internationalization process of a company. The complete details of results are presented in the first appended paper.

4.2 Paper 2: Born globals: a cross-country survey on high-tech start-ups

G. Cannone, E. Ughetto (2014). Born globals: a cross-country survey on high-tech start-ups. International Business Review, 23(1) 272-283.

The paper empirically investigates what drivers affect the decisions of high-tech start-ups to internationalize from the outset, and their degree of born-globalness. The present study is a first attempt to perform multi-level research, by examining to what extent the decision to internationalize from the inception, as well as a firm's degree of born-globalness, is the result of factors that occur at firm, individual and country level. The results (see Appendix 7.3.2 and 7.3.3) of a survey on internationalized high-tech start-ups operating in the ICT and electronics sectors and located in different countries throughout the world have confirmed that the presence of a small domestic market and the scalability of the product have a positive effect on the probability that a start-up internationalizes from its inception. It has also been observed that the niche strategy and the network relationships built by the entrepreneur are key drivers for both early internationalization and the scope of international expansion. The ability of the entrepreneur to recognize and exploit opportunities largely depends on his/her entrepreneurial orientation, capabilities and experiential knowledge. In particular, proficiency in foreign languages has proved to matter more than education or age in the decision to internationalize early, while it is not a discriminating factor on a born global's degree of born-globalness. The entrepreneur's experiential knowledge and international commitment, as well as the diversity of team competences and organizational flexibility of a firm have a significant impact on a born global's degree of born-globalness, although it is not a fundamental precondition for early internationalization. The overall picture obtained from the empirical analysis has highlighted that the choice of the internationalization pathway for a firm is the result of a complex mix of firm, environmental and individual factors. The implications for managers and policy makers are therefore numerous. First, the entrepreneurs with aspirations of early internationalization should be well aware of the importance of consolidated network relationships if they want to achieve internationalization rapidly. The adoption of a strategy of focalization is relevant for those firms that wish to address several markets at once in their early internationalization process. Second, another prerequisite for aspiring global entrepreneurs is the knowledge of foreign languages, which also helps them to shape an international mindset. Third, experience is crucial when the focus is on large scale internationalization and on the opening up of new geographical markets. International commitment and the experiential knowledge of the entrepreneur are in fact of paramount importance in forging the scope of early internationalization. While born globals are rapidly expanding worldwide, as advances in telecommunication,

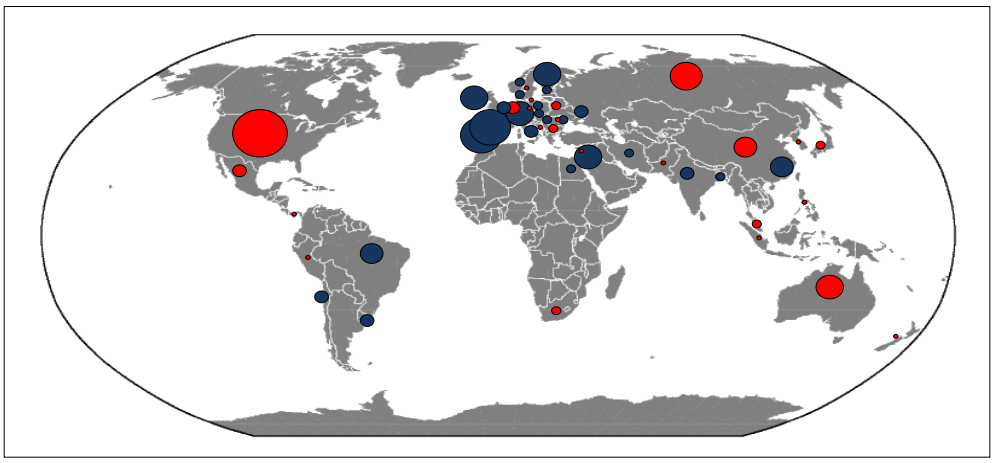
transportation and technology at large are shrinking physical and cultural distances and facilitating human capital mobility, the extent of their diffusion largely depends upon whether certain conditions are in place. A deeper understanding of the conditions under which born globals are likely to prosper could stimulate policy makers to sustain a firm's early internationalization through appropriate support programs.

4.3 Paper 3: Internationalization flows of high-tech start-ups: a gravity model

G. Cannone, E. Ughetto. Internationalization flows of high-tech start-ups: a gravity model. Submitted to Journal.

The paper examines the locational determinants of the internationalization flows of high-tech start-ups. It also provides a picture of the current patterns of internationalization of high-tech start-ups, through a map of the most attractive countries in terms of inbound and outbound internationalization flows. The empirical data have been obtained from a cross-country survey on internationalized high-tech start-ups operating in the ICT and electronics sectors.

Figure 8. Positive and negative net flows of internationalization



* In red positive net flows, in blue negative net flows. Net flows are defined as the difference between the inbound and the outbound flows. The blue circles indicate countries characterized by negative net flows, while the red circles identify countries with positive net flows. The diameter of the circle represents the size of the net flows.

The paper contributes to the international business literature in two ways. First, it provides a comprehensive visualization of the current patterns of internationalization of high-tech start-ups. Results highlight that US, UK and Canada are the most competitive countries in terms of inbound flows (Table 6). It is also interesting to notice that China is quite attractive but few Chinese companies start an early internationalization process.

Many European countries, apart from UK, are not able to be as competitive as United States, Canada and India.

Table 6. Top ten countries for outbound and inbound internationalization flows

	Outbound flows			Inbound flows		
Rank	**Country**	**Flow size**	**%**	**Country**	**Flow Size**	**%**
1	USA	98	22.84%	USA	152	35.43%
2	United Kingdom	49	11.42%	United Kingdom	65	15.15%
3	Canada	23	5.36%	Canada	23	5.36%
4	Spain	23	5.36%	India	16	3.73%
5	France	20	4.66%	Australia	12	2.80%
6	India	19	4.43%	China	12	2.80%
7	Italy	13	3.03%	Germany	12	2.80%
8	Israel	12	2.80%	Netherlands	12	2.80%
9	Switzerland	12	2.80%	Italy	10	2.33%
10	Germany	11	2.56%	Argentina	9	2.10%

Second, the study examines the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries. Based on a database of 429 internationalized high-tech start-ups targeting 76 countries and operating in the ICT and electronics sectors, the paper finds that internationalization flows of high-tech start-ups are motivated by the sourcing of host-country locational advantages, identified by the strength of the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of IPR protection. For the complete set of results see Appendix 7.4.2.

Results have clear implications for policy makers. A deeper understanding of the conditions under which foreign innovative firms are likely to enter the domestic market is crucial for policy makers who intend to attract technology-based firms from all over the world. Currently, in most public policy agendas, the main objective is to foster the creation and growth of domestic entrepreneurship, whereas fewer efforts are directed towards attracting foreign entrepreneurs and start-ups. The extent of the diffusion of internationalized high-tech start-ups largely depends upon whether enabling conditions are in place. The pace at which small high-tech firms expand internationally might be constrained by the absence or limited presence of adequate policies in hosting countries. This situation calls for new challenges to policy makers that have to introduce appropriate regulations/incentive schemes or simply to adapt extant regulations to new demands from the market and to changes in technology.

The overall picture obtained from the empirical analysis has highlighted that high-tech start-ups are attracted by those countries able to provide a legal and regulatory framework which guarantees a high level of trust and confidence to new entrants. Indeed, an adequate level of investors' protection and the presence of lean procedures to resolve commercial disputes are found to provide foreign investors a safer environment to invest in. In addition, a strong protection of intellectual property rights in the host country increases the confidence of foreign innovators, who are less concerned with the possibility that competitors appropriate the value generated from their investments in innovation.

Other major drivers that influence the attractiveness of a host country for high-tech start-ups are the availability of venture capital financing and the level of a country's innovation capacity. The evidence of the positive role played by venture capital in strengthening the entrepreneurial activity in a country, has led many governments to mobilize venture capital and to sustain public/private VC partnerships. Investments in R&D are extremely relevant because a dynamic and advanced innovation system allows not only for the creation of domestic high-tech companies, but also for the attraction of innovative companies from other countries.

To conclude, policy makers aiming at creating a favorable environment for internationally oriented high-tech start-ups should consider three main guidelines in their agendas: 1) creating a clear legal and regulatory environment to provide foreign investors trust and confidence in the host market; 2) mobilizing private capital to fuel into VC funds, in order to match the internal demand but also to attract the foreign demand; 3) investing in R&D in order to increase the country's innovation capacity to attract foreign technology-based companies.

5 DISCUSSION AND CONCLUSIONS

This section provides a summary and a discussion of the results of the thesis and it suggests some practical managerial implications for potential global entrepreneurs and some policy implications for policy makers willing to foster new entrepreneurship. The section ends with limitations of the current study and suggestions for future research.

5.1 Discussion of results

This thesis contributes to the international entrepreneurship literature in multiple ways.
First, by exploring the born global phenomenon under the young entrepreneurship lenses; the youth entrepreneurship is a phenomenon which is yet underdeveloped within entrepreneurship academic field but which would deserve further investigation since the size of the phenomenon and the consequently interest by policy making are increasing. The multiple case analysis highlights how the limited financial resources for young entrepreneurs seem to be a triggering factor to adopt a born global approach since they tend to be directed towards those countries offering more financial resources. Moreover, results highlight the importance of professional networks built by entrepreneurs before establishing the company. In particular, consistently to McDougall et al. 1994, the study points out how networks helped founders of born globals to recognize and exploit international business opportunities. Young entrepreneurs, characterized by a lower social capital for age-related reasons, seem to invest heavily into widening their social network so to countervail the young age effect. Moreover, the prior experience abroad (either as entrepreneur or as employee or as undergraduate or graduate student) triggers and shapes the internationalization process of a company.
The second paper confirms, expands and generalizes the preliminary results through a cross-country survey. This study indeed is an attempt to make a contribution to the literature on born globals by examining the determinants of early internationalization in a cross-country context considering the dimensions of the extent, the speed and the scope. In particular, literature has to a great extent ignored this last dimension of the early internationalization process. The present study is a first attempt to perform multi-level research, by examining to what extent the decision to internationalize from the inception, as well as a firm's degree of born-globalness, is the result of factors that occur at firm, individual and country level. Results have confirmed that the presence of a small domestic market, the scalability of the business and a niche approach have a positive effect on the probability

of a start-up to internationalize from its inception. In addition, the network relationships built by the entrepreneur are confirmed to be key drivers for early internationalization and they appear to be crucial also for the scope of international expansion. Factors related to the entrepreneur are also quite relevant; the ability of the entrepreneur to recognize and exploit opportunities largely depends on his/her entrepreneurial orientation, capabilities and experiential knowledge. In particular, proficiency in foreign languages has proven to matter more than education or age in the decision to internationalize early, while it is not a discriminating factor on a born global's degree of born-globalness. The entrepreneur's entrepreneurial orientation and international commitment, as well as the diversity of team competences and organizational flexibility of a firm have a significant impact on a born global's degree of born-globalness, although it is not a fundamental precondition for early internationalization. The overall picture obtained from the empirical analysis has highlighted that the choice of the internationalization pathway for a firm is the result of a complex mix of firm, environmental and individual factors.

Finally, the second part of the research (third paper) concludes the research by analyzing where the entrepreneurs decide to internationalize. Indeed this section analyzes the dynamics of internationalization providing an empirical explanation to the flows of internationalization of the born global firms investigated. It contributes to the international business literature in two ways. First, it provides a comprehensive visualization of the current patterns of internationalization of high-tech start-ups. It highlights how US, UK, Canada, India and China seem to be the most attractive countries for internationally oriented start-ups, highlighting the role of some of the BRICS countries as well as the historical role of Anglo-Saxon countries in attracting technology. On the contrary, several European countries suffer and are not able to be equally competitive. Second, the study examines the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries. The paper finds that internationalization flows of high-tech start-ups are motivated by the sourcing of host-country locational advantages, identified by the strength of the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of IPR protection.

5.1 Managerial implications

Managerial implications are numerous. First, the entrepreneurs with aspirations of early internationalization should be well aware of the importance of consolidated network relationships. Also young entrepreneurs, those who lack them most, should be aware of their importance in the internationalization process and put a larger effort in building them. In addition, the experience of the founders, either a study or work experience, seems to be the real enablers of born global

companies, indeed a prior experience abroad (not necessarily as entrepreneur in the same business/segment) seems to be a trigger factor for an early internationalization; moreover there is a strong correlation between the place where the prior experience took place and the areas of internationalization of the born globals. Another prerequisite for aspiring global entrepreneurs is the knowledge of foreign languages, which also helps them to shape an international mindset. These results are of fundamental importance for entrepreneurs also in the recruitment stage; indeed, the construction of a well-balanced team is largely recognized to be a critical factor for the success of a start-up. Hence, the founders should take into account these characteristics when hiring a team member and a strategic key decision would be to hire someone with a previous experience in the geographical market the entrepreneur is willing to expand. The same hold for young entrepreneur that might lack some of the fundamental previous knowledge of the market, hence it would be beneficial for them to complete the team with people more experienced on the geographical market they want to expand.

The adoption of a strategy of focalization and niche positioning are also relevant for those firms that wish to address several markets at once in their early internationalization process; indeed firms that undertake a niche approach should seriously consider an early internationalization approach to gain scale so to avoid to be overthrown by competitors and hence to avoid the company to fail.

International commitment and the experiential knowledge of the entrepreneur are in fact of paramount importance in forging the scope of early internationalization.

5.2 Policy implications

The results of the thesis have clear implications for policy makers too. While born globals are rapidly expanding worldwide, as advances in telecommunication, transportation and technology at large are shrinking physical and cultural distances and facilitating human capital mobility, the extent of their diffusion largely depends upon whether certain conditions are in place. The pace at which firms expand internationally from their inception might be constrained by the absence or limited presence of adequate policies. A deeper understanding of the conditions under which foreign innovative firms are likely to enter the domestic market is crucial for policy makers who intend to attract innovative high technology start-ups from all over the world. Currently, policy makers have directed their efforts in fostering the creation and growth of domestic entrepreneurship, whereas less effort is directed towards attracting foreign entrepreneurs and start-ups. This situation calls for new challenges to policy makers that have to introduce appropriate regulations/incentive schemes or simply to adapt extant regulations to new demands from the market and to changes in technology.

The overall picture obtained from the empirical analysis has highlighted that high-tech start-ups are attracted by those countries able to provide a legal and regulatory framework which guarantees a high level of trust and confidence to new entrants. Indeed, an adequate level of investors' protection and the presence of lean procedures to resolve commercial disputes are found to provide foreign investors a safer environment to invest in. In addition, since the subject of the research is on innovative high tech start-ups, the role of the intellectual property rights system of a host country is confirmed as being quite relevant as it increases the confidence of foreign innovators, who are less concerned with the possibility that competitors appropriate the value generated from their investments in innovation. This result confirms that although many scholars and policy makers support the idea that the IPR systems across different countries are characterized by several contradictions and discrepancies, it still seems to play a sort of certification role for investors.

Other major drivers that influence the attractiveness of a host country for high-tech start-ups are the availability of venture capital financing and the level of a country's innovation capacity. The evidence of the positive role played by venture capital in strengthening the entrepreneurial activity in a country, has led many governments to mobilize venture capital and to sustain public/private VC partnerships. Although the effectiveness of these policy instruments seems not to be largely proven and there is a large variability among different tools policy makers have adopted, still the availability of venture capital as a source to finance new venture is confirmed to be quite relevant.

Investments in R&D are extremely relevant because a dynamic and advanced innovation system allows not only for the creation of domestic high-tech companies, but also for the attraction of innovative companies from other countries. Moreover, this point refers also to the capacity a country has to attract or retain talents.

To conclude, policy makers aiming at creating a favorable environment for internationally oriented high-tech start-ups should consider three main guidelines in their agendas: 1) creating a clear legal and regulatory environment to provide foreign investors trust and confidence in the host market; 2) mobilizing private capital to fuel into VC funds, in order to match the internal demand but also to attract the foreign demand; 3) investing in R&D in order to increase the country's innovation capacity to attract foreign technology-based companies.

Table 7. Summary of results of the thesis and its implications

Result	**Implication**
The entrepreneur's professional network positively influences the extent of early internationalization and its scale	A potential global entrepreneur should invest heavily in creating or expanding his/her international professional network so to compensate with the lack of personal assets in foreign countries
The entrepreneur's previous experience abroad positively	Founders should consider the knowledge of a particular geographical market as essential; hiring a team member with a previous experience

influences the ability to start a born global company	in that geographical area could be very strategic
A small domestic market and a niche market approach is a driver to start a born global	Entrepreneurs who start their business in a small market should be well aware that a rapid internationalization is key for the survival and success of the venture; the same holds for ventures addressing a niche market approach
Business scalability facilitates the early internationalization	Entrepreneurs working on a scalable business should take advantage of the lower costs and time for internationalization and expand internationally quickly
Entrepreneurial orientation and international commitment positively influence the scale of early internationalization	The role of the entrepreneur in driving the process of early internationalization is extremely relevant. If the entrepreneur lacks the vision and courage to embark in rapid internationalization would be difficult to engage him/her in a substancial internationalization process
The diversity of team competences and organizational flexibility positively influence the scale of early internationalization	Creating a flexible team with very diverse background would facilitate a substancial internationalization process
An adequate level of investors' protection and the presence of lean procedures to resolve commercial disputes makes a country attractive for international start-ups	Structuring a lean and transparent legal and regulatory environment trusted by foreign investors will contribute to attract international start-ups in the country
Strong protection of intellectual property rights makes a country attractive for international start-ups	Policy makers should ensure that IPRs system offers a reliable, timely and effective protection to international innovators and that procedures are interoperable with other countries.
Availability of venture capital financing makes a country attractive for international start-ups	Policy malers should ensure or foster private capital to fuel into VC funds, in order to match the internal demand but also to attract the foreign demand for equity. A developed VC industy is necessary for a country which wants to become house of the best and most promising international start-ups
A country characterized by a high innovation capacity attracts international start-ups	Policy makers should invest in R&D because a dynamic and advanced innovation system allows not only for the creation of domestic high-tech companies, but also for the attraction of innovative companies from other countries

5.3 Limitations and further research

There are some clear limitations in the present thesis which indicate the necessity of further research. A first important limitation of the study is the lack of cause-effect propositions due to the lack of longitudinal data to be analyzed and tested; indeed the research lacks all the potential explanations about causal links or temporal stability which would be of particular importance in the international entrepreneurship literature. Longitudinal studies might shed further light on firms' internationalization patterns and trajectories. In that sense, events that took place in different periods of time in each of the countries studied could be controlled for. Although expensive in term of effort, studies based on longitudinal research are vital to provide further theoretical explanations and empirical evidence to the international entrepreneurship literature.

Considering the limitations on methodological aspects, first of all the database used is a property of a US journal and it is possible that this creates some bias to the presence and type of international firms, indeed the majority of firms included are US based or they report to have an office in the US. The increasing popularity that this database is gaining might reduce this bias by encouraging a larger number of firms from other countries to register on the database. Second, the limited size of the sample of born globals and the fact that the survey was only addressed to internationalized firms constitutes a relevant limitation. In addition, since the presence of at least one international office (desk) was used as a selection criterion to identify internationalized firms, it follows that some firms that could have been considered international (because they export through agents or fill in orders from abroad, without reporting an international office) might probably have been overlooked. However, limiting the dataset to only firms with at least one international office (or desk) led to a reduction in the possibility of distorted information on internationalization behavior from the answers to the survey, which could not be verified.

Another important limitation that opens avenue for future research is the focus of the thesis on firms active in the ICT sector. Indeed studies comparing ICT with firms based on other types of technologies such as clean technologies, biotech, healthcare, nano-technologies etc. would provide further explanations on the born global phenomenon. Indeed, those sectors are characterized by much longer time for product development and time to market, they need quite larger investments and are less scalable than ICT businesses. In addition also sample based on low tech or services companies would heavily contribute to the born global literature by reducing the existing gap on these types of firms.

Considering the theoretical framework, the choice of the dimensions explored might be incomplete. Future research could extend the exploration of the different influences that affect the phenomenon of born globals by refining the outlined dimensions and by including further elements. The industry structure, the competitive arena, the characteristics of network relationships (strength, size and density), the state of the distribution channels and the host country conditions are assumed to account for many of the variations in internationalization patterns but remain issues that deserve further exploration. Furthermore, more information are needed about whether certain fruitful individual-level characteristics may be set off by adverse environmental or firm-level conditions or vice versa. The understanding of the interconnections that exist between the personal characteristics of the entrepreneurs, a firm's strategies and resource bases and the institutional, industrial and economic environment needs to be further elaborated to gain a deeper understanding of the born global phenomenon. In addition, although the cross-national sample, characteristics relates to national culture have not been included in the studies.

Finally, valuable insights could be derived from a close examination of the distinctive contexts and of the related policies that have to be implemented to facilitate the diffusion of born globals. In this sense, a cross-country comparison of the instruments, programs and laws that are actually in place or an examination of the effects that more or less restrictive policies might have on the speed and breadth of the phenomenon of born globals is rich in potential for future research.

Another limitation concerning the last part of the thesis (third paper) is represented by the country level focus of the analysis. Countries may present a significant variability within regions or cities of the conditions to attract high-tech start-ups. The concentration of top-level universities, networks of entrepreneurs, technology or VC investors in a particular area, and the presence of specific regulations at regional or city level, could push high-tech start-ups towards a particular area of the country. Narrowing the focus of the analysis to the regional/city levels will open an avenue for future research. Another limitation concerns the choice of the dimensions explored in the analysis, which might be incomplete. Future research could extend the exploration of the determinants that affect the intensity of the internationalization flows of high-tech start-ups by including further elements.

To conclude, future research should concentrate more on the output of international entrepreneurship by exploring the links between international entrepreneurship and competitive advantage or financial and non-financial performance outcomes. Similarly, little is known about what these firms do after they enter new markets and how they remain entrepreneurial in their approach. First mover advantages would suggest that international entrepreneurship speed would be related to competitive advantage while extent of internationalization may be related to non-financial outcomes such as organizational learning or multiple locations of value chain components to reduce transaction costs. Future research can help improve our understanding of these interesting but complex issues.

6 REFERENCES

Aldrich, H. E., & Baker, T. (1997). Blinded by the cities? Has there been progress in entrepreneurship research? In D.L. Sexton and R.W. Smilor (eds), Entrepreneurship 2000 (377-400). Chicgo: Upstart Publishing.

Alesina, A., Ardagna, S., Nicoletti, G., & Schiantarelli, F. (2005). Regulation and investment. *Journal of the European Economic Association,* 3(4), 791–825.

Amit, R., Glosten, L., & Muller, E. (1993). Challenges to theory development in entrepreneurship research. *Journal of Management Studies*, 30, 834.

Antunes, A., & Cavalcanti, T. (2007). Start-up costs, limited enforcement, and the hidden economy. *European Economic Review,* 51(1), 203–24.

Audretsch, D. (1991). New firm survival and the technological regime. *Review of Economics and Statistics*, 68, 520-526.

Autio, E., Sapienza, H., & Alméida, J. (2000). Effects of age at entry, knowledge intensity, and imitability of international growth. *Academy of Management Journal*, 43(5), 909-1014.

Baldwin, R. (2006). Globalisation: the great unbundling (s). *Economic Council of Finland*, *20*.

Barseghyan, L. (2008). Entry costs and cross-country differences in productivity and output. *Journal of Economic Growth,* 13(2), 145–67.

Baron, R. (2001). Counterfactual thinking and venture formation: The potential effects of thinking about "what might have been." *Journal of Business Venturing.*

Blonigen, B., & Piger, J. (2011). Determinants of foreign direct investment. NBER Working Paper 16704, National Bureau of Economic Research, Cambridge, MA.

Bloodgood, J. M., Sapienza, H. J., & Almeida, J. G. (1996). The internationalization of new high-potential US ventures: Antecedents and outcomes. *Entrepreneurship Theory and Practice*, *20*, 61-76.

Blum, B. S., & Goldfarb, A. (2006). Does the internet defy the law of gravity?.*Journal of international economics*, *70*(2), 384-405.

Bolton, B., & Thompson, J. (2000). Entrepreneurs, Temperament, Talent, Technique.

Buckley, P., Clegg, J., Cross, A., Liu, X., Voss, H., & Zheng, P. (2007). The determinants of Chinese outward foreign direct investment. *Journal of International Business Studies*, 38(4), 499–518.

Burgel, O., & Murray, G. C. (1998). The international activities of British start-up companies in high-technology industries: Differences between internationalisers and non-internationalisers. *Frontiers of entrepreneurship research*, *18*, 447-63.

Busenitz, L., & Barney, J. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, 12, 9-30.

Busenitz, L.W., Page West III, G., Sheperd, D., Nelson, T., Chandler, G. N. & Zacharakis, A. (2003). Entrepreneurship Research in Emergence: Past Trends and Future Directions. *Journal of Management*, 29(3), 285-308.

Buzzacchi, L., Scellato, G., & Ughetto, E. (2013). The investment strategies of publicly sponsored venture capital funds. *Journal of Banking & Finance*, 37, 707–716.

Casson, M. (1982). The entrepreneur. Totowa, NJ: Barnes & Noble Books

Ceglowski, J. (2006). Does gravity matter in a service economy?. *Review of World Economics*, *142*(2), 307-329.

Chetty, S., & Campbell-Hunt, C. (2004). A strategic approach to internationalization: A traditional versus a "born global" approach. *Journal of International Marketing*, 12(1), 57-81.

Cooper, A., Woo, C., & Dunkelberg, W. (1989). Entrepreneurship and the initial size of firms. *Journal of Business Venturing*, 4, 317-332.

Couper, M.P. (2000). Web Surveys: A Review of Issues and Approaches. *Public Opinion Quarterly*, 64 (4), 464-94.

Coviello, N. E., & Jones, M. V. (2004). Methodological issues in international entrepreneurship research. *Journal of Business Venturing*, *19*(4), 485-508.

Coviello, N. E., & Munro, H. J. (1995). Growing the entrepreneurial firm: networking for international market development. *European journal of marketing*, 29(7), 49-61.

Criscuolo, P., Narula, R., & Verspagen, B. (2005). Role of home and host country innovation systems in R&D internationalisation: a patent citation analysis. *Economics of Innovation and New Technology*, 14(5), 417–433.

Dachs, B., & Pyka, A. (2010). What drives the internationalisation of innovation? Evidence from European patent data. *Economics of Innovation and New Technology*, 19(1), 71–86

De Benedictis, L., & Taglioni, D. (2011). The gravity model in international trade.

Denzin, N. K. & Lincoln, Y. S. (2000). *Handbook of Qualitative Research*: SAGE, Thousand Oaks.

De Beule, F., & Duanmu, J.L. (2012). Locational determinants of internationalization: A firm-level analysis of Chinese and Indian acquisitions. *European Management Journal,* 30, 264– 277.

Dillman, D. A. (2000). Mail and Internet Surveys, The Tailored Design Method (Second ed.). New York: Wiley.

Disdier, A., & Head, K. (2008). The puzzling persistence of the distance effect on bilateral trade. *The Review of Economic and Statistics,* 90 (1), 37–48.

Dunning, J.H. (1977). Trade, location of economic activity and MNE: A search for an eclectic approach. In B. Ohlin, P. O. Hesselborn, & P. J. Wijkmann (Eds.). The international allocation of economic activity (398–418). London: McMillan.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, *14*(4), 532-550.

Eriksson, P. E. (2007). Effeient Governance of Construction Projects through Cooperative Procurement Proceduers. Doctoral Thesis, Luleå University of Technology, Luleå.

Evans, D., & Leighton, L. (1989). Some empirical aspects of entrepreneurship. *American Economic Review*, 79, 519-535

Fletcher, R., & Bohn, J. (1998). The impact of psychic distance on the internationalisation of the Australian firm. *Journal of Global Marketing*, *12*(2), 47-68.

Fontes, M., & Coombs, R. (1997). The coincidence of technology and market objectives in the internationalisation of new technology-based firms. *International Small Business Journal*, *15*(4), 14-35.

Freund, C., & Bolaky, B. (2008). Trade, regulations and income. *Journal of Development Economics* 87, 309–21.

Gabrielsson, M., Kirpalani, V. H., Dimitratos, P., Solberg, C. A., & Zucchella, A. (2008). Born globals: Propositions to help advance the theory. *International Business Review*, *17*(4), 385-401.

Gabrielsson, M., & Pelkonen, T. (2008). Born internationals: market expansion and business operation mode strategies in the digital media field. *Journal of International Entrepreneurship*, *6*(2), 49-71.

Ganesan, S., Malter, A. J., & Rindfleisch, A. (2005). Does distance still matter? Geographic proximity and new product development. *Journal of Marketing*, 44-60.

Ghemawat, P. (2001). Distance still matters. *Harvard business review*, *79*(8), 137-147.

Giacon, P., & Muffatto, M. (2012) Moving the lens towards young entrepreneurs: Specificities, research questions and future directions. Paper presented at International Symposium of Entrepreneurship and Innovation. 23-25 May 2012. Venice, Italy.

Glaser, B., & Strauss, A. (1967). The discovery ofgrounded theory. *London: Weidenfeld and Nicholson*.

Granstrand, O., Håkanson, L., & Sjölander, S. (1993). Internationalization of R&D. A survey of some recent research. *Research Policy*, 22, 413–430.

Griffis, S.E., Goldsby, T.J., & Cooper, M. (2003). Web based and mail surveys: a comparison of response, data and cost. *Journal of Business Logistics*, 24 (2), 237-258.

Grosse, R., & Trevino, L.J. (1996). Foreign direct investment in the United States: An analysis by country of origin. *Journal of International Business Studies*, 27, 39–155.

Guiso, L., Sapienza, P., & Zingales, L. (2009). Cultural biases in economic exchange?. *The Quarterly Journal of Economics*, *124*(3), 1095-1131.

Hair, J. F. , Black, W. C. , Babin, B. J. , Anderson, R. E. & Tatham, R. L. (2006). Multivariate Data Analysis. Upper Saddle River, USA: Prearson Prentice Hall.

Hallén, L., & Wiedersheim-Paul, F. (1979). Psychic distance and buyer-seller interaction. *Organisasjon, Marked og Samfunn*, *16*, 308-325.

Harmeling, S. S., & Sarasvathy, S. D. (2011). When contingency is a resource: Educating entrepreneurs in the Balkans, the Bronx, and beyond. *Entrepreneurship Theory and Practice*.

Hornberger, K., Battat, J., & Kusek, P. (2011). Attracting FDI: How much does investment climate matter?. Viewpoint Note 327, World Bank Group, Washington, DC.

Irwin, D., & Klenow, P. (1996). High-tech R&D subsidies: estimating the effects of Sematech. *Journal of International Economics*, 40, 323–344.

Jandhyala, S. (2012). Property rights and international investment in information technology services. *Strategic Management Journal*, doi: 10.1002/smj.2032.

Jansen, K. J., Corley, K. G., & Jansen, B. J. (2007). E-survey methodology. *Handbook of research on electronic surveys and measurements*, 416-425.

Johanson, J., & Vahlne, J. E. (1977). The internationalization process of the firm-a model of knowledge development and increasing foreign market commitments. *Journal of international business studies*, 23-32.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firm—four swedish cases. *Journal of management studies*, *12*(3), 305-323.

Jones, M.V., Coviello, N., & Tang, Y.K. (2011). International Entrepreneurship research (1989–2009): A domain ontology and thematic analysis. *Journal of Business Venturing*, 26, 632–659.

Keupp, M. M., & Gassmann, O. (2009). The past and the future of international entrepreneurship: a review and suggestions for developing the field. *Journal of Management*, *35*(3), 600-633.

Kimura, F., & Lee, H. H. (2006). The gravity equation in international trade in services. *Review of world economics*, *142*(1), 92-121

Kirzner, I.M. (1973). *Competition and entrepreneurship*. Chicago, Ill.: The University of Chicago Press, pp. 1-9 and 30-87

Klapper, L., Lewin, A., & Quesada Delgado, J.M. (2009). The impact of the business environment on the business creation process. Policy Research Working Paper 4937, World Bank, Washington, DC.

Klassen, Robert D. & Jennifer Jacobs (2001). Experimental Comparison of Web, Electronic and Mail Survey Technologies in Operations Management. *Journal of Operations Management*, 19 (6), 713-28.

Knight, G.A. & Cavusgil, S.T. (1996). The Born Global Firm: A Challenge to Traditional Internationalization Theory, in S.T. Cavusgil and T. Madsen (eds.) Advances in International Marketing, Vol. 8 JAI Press: Greenwich, CT. pp. 11-26.

Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of international business studies*, 411-432.

Krugman, P. (1980). Scale economics, product differentiation and the pattern of trade. *The American Economic Review*, 70(5), 950–959.

Kuivalainen, O., Sundqvist, S., & Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business*, *42*(3), 253-267.

Laanti, R., Gabrielsson, M., & Gabrielsson, P. (2007). The globalization strategies of business-to-business born global firms in the wireless technology industry. *Industrial Marketing Management*, *36*(8), 1104-1117.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1998). Law and finance. *Journal of Political Economy,* 106, 1113–1155.

Lewis, K., & Massey, C. (2003). Delivering enterprise education in New Zealand. *Education+ Training*, *45*(4), 197-206.

Lewer, J.J., & Van den Berg, H. (2008). A gravity model of immigration. *Economics Letters*, 99(1), 164-167.

Loane, S., Bell, J. D., & McNaughton, R. (2007). A cross-national study on the impact of management teams on the rapid internationalization of small firms. *Journal of World Business*, *42*(4), 489-504.

Longino, H. E. (1990). *Science as social knowledge*. Chichester, UK: Princeton University Press.

Lopez, L. E., Kundu, S. K., & Ciravegna, L. (2008). Born global or born regional quest; Evidence from an exploratory study in the Costa Rican software industry. *Journal of International Business Studies*, *40*(7), 1228-1238.

Madsen, T. K., & Servais, P. (1997). The internationalization of born globals: an evolutionary process?. *International Business Review*, 6(6), 561-583.

Mclean, R. D., Zhang, T., & Zhao, M. (2012). Why does the law matter? Investor protection and its effects on investment, finance, and growth. *Journal of Finance,* 67, 313–50.

McDougall, P.P. (1989). International versus domestic entrepreneurship: new venture strategic behavior and industry structure. *Journal of Business Venturing*, *4*(6), 387-400.

McDougall, P. P., Shane, S., & Oviatt, B. M. (1994). Explaining the formation of international new ventures: The limits of theories from international business research. *Journal of business venturing*, *9*, 469-487.

McDougall, P. & Oviatt, B. M. (2000). International Entrepreneurship: The Intersection of Two Research Paths. *The Academy of Management Journal*, 43(5), 902-906.

Neuman, W. L. (2003). *Social Research Methods*. USA: Allyn and Bacon.

O'Grady, S., & Lane, H. W. (1996). The psychic distance paradox. *Journal of International Business Studies*, 309-333.

Oviatt, B. M., & McDougall, P. P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies*, 25(1), 45–64.

Oviatt, B. M., & McDougall, P. P. (1999). A framework for understanding accelerated international entrepreneurship. *Research in global strategic management*, *7*, 23-40.

Peri, G. (2005). Determinants of knowledge flows and their effect on innovation. *The Review of Economics and Statistics*, 87 (2), 308–322.

Picci, L. (2010). The internationalization of inventive activity: A gravity model using patent data. *Research Policy*, 39 (8), 1070-1081.

Posner, M. V. (1961). International trade and technical change. *Oxford economic papers*, *13*(3), 323-341.

Porter, M.E. (1980) Competitive Strategy. New York: Free Press.

Rialp, A., Rialp, J., & Knight, G. A. (2005). The phenomenon of early internationalizing firms: what do we know after a decade (1993–2003) of scientific inquiry?. *International business review*, *14*(2), 147-166.

Sarasvathy, D., Simon, H., & Lave, L. (1998). Perceiving and managing business risks: Differences between entrepreneurs and bankers. *Journal of Economic Behavior and Organization*, 33, 207-225.

Shane, S., (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11, 448-469.

Shane, S. & Venkataraman, S., (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*.

Schumpeter, J.A. (1934) The theory of economic development. An inquiry into profits, capital, credit, interest, and the business cycle. New Brunswick: Transaction Publishers, pp.3-9 and 57-94.

Schumpeter, J. A. (1965). "Capitalism, socialism and democracy. 10th impr.".

Shih, T.-H., & Fan, X. (2008). Comparing response rates from web and mail surveys: A meta-analysis. *Field Methods*, 20, 249-271.

Timmons, J. A., Spinelli, S., & Ensign, P. (2010). New venture Creation: Entrepreneurship for the 21st Century (Canadian Edition). *Canada: McGraw-Hill Ryerson*.

Vahlne, J. E., & Wiedersheim-Paul, F. (1973). Economic distance: model and empirical investigation. *Export and foreign establishments*, 81-159.

Venkataraman, S. (1997). The Distinctive Domain of Entrepreneurship Research [w:] Advances in Entrepreneurship, Firm Emergence and Growth.

Vernon, R. (1966). International investment and international trade in the product cycle. *The quarterly journal of economics*, 190-207.

Wallsten, S. J. (2000). The effects of government–industry R&D programs on private R&D: the case of the Small Business Innovation Research Program. *RAND Journal of Economics,* 31(1), 82–100.

Ward, T., Smith, S., & Vaid, J. (Eds.). 1997. Creative thought. Washington, DC: American Psychological Association.

Yin, R. K. (2003). Case Study Research: Design and Methods (3rd ed.): Sage Publications, Inc.

Zahra, S. A., & Garvis, D. M. (2000). International corporate entrepreneurship and firm performance: The moderating effect of international environmental hostility. *Journal of Business Venturing*, *15*(5), 469-492.

Zahra, S. A., & George, G. (2002). International entrepreneurship: the current status of the field and future research agenda. *Strategic entrepreneurship: Creating a new mindset*, 255-288.

Zahra, S. A., Matherne, B. P., & Carleton, J. M. (2003). Technological resource leveraging and the internationalisation of new ventures. *Journal of International Entrepreneurship*, *1*(2), 163-186.

Zain, M., & Ng, S. I. (2006). The impacts of network relationships on SMEs' internationalization process. *Thunderbird International Business Review*, *48*(2), 183-205.

Zucchella, A., Palamara, G., & Denicolai, S. (2007). The drivers of the early internationalization of the firm. *Journal of World Business*, 42 (3), 268–280.

7 APPENDIX

7.1 Case study

7.1.1 Protocol for the interviews for the case studies analysis Italian (English)

Imprenditore *(entrepreneur)*

Informazioni personali: *(personal information)*

Nome:
Cognome :
Anno di nascita :
Luogo di nascita:
Comune di residenza :

Formazione: *(education)*

Ultimo livello di formazione conseguito:
Che tipo di formazione: ☐ Business ☐ Engineering/Natural Sciences ☐ Humanities ☐ Social Sciences ☐
Other:
Esperienze all'estero:
Stage:

Esperienza lavorativa: *(work experience)*

Nome azienda:	
Periodo (da-a)	
Luogo:	
Posizione/i ricoperte:	
Nome azienda:	
Periodo (da-a)	
Luogo:	
Posizione/i ricoperte	
Nome azienda:	
Periodo (da-a)	
Luogo:	

Posizione/i ricoperte	

Esperienza imprenditoriale precedente *(Previous entrepreneurial experience)*

Nome azienda			
Luogo			
Anno di costituzione:			
Ricavi	Max (year)	Last year	% abroad (avg)
	(€k)	(€k)	(€k)
Numero di dipendenti	Max (year)	Last year	
Fonti di finanziamento	Type	Amount	
		(€k)	
		(€k)	
		(€k)	
Breve descrizione del business:			
L'azienda è ancora attiva?			
Sei ancora coinvolto nella gestione dell'azienda? Internazionalizzazione %fatturato estero Anno espansione estera Modalità di internazionalizzazione: (esportazione diretta/indiretta; accordi (varie tipologie); IDE) Principali tre mercati esteri di riferimento da un punto di vista commerciale: In caso di IDE, N. filiali estere (elenco con anno costituzione e luogo):			

Ruolo svolto dall'imprenditore: Exit Anno di exit Fatturato e dipendenti al momento della exit:	

Azienda attuale *(Current company)*

Nome:

Data di costituzione:

Location (Attuale o pianificata) :

Che tipo di start-up :

1. Web
2. Mobile
3. Web/mobile + physical Inventory
4. Web/mobile + HW
5. Web/mobile + Consulting
6. SW (non web)
7. HW
8. Service
9. Other

Il profilo dell'impresa e dell'imprenditore *(Profile of the venture and of the entrepreneur)*

Modello di Business *(Business Model)*

- Qual è il/i vostro/i prodotto/i e relativa/e value proposition?
- A che stage è il prodotto principale?: Concept In Development Working Prototype Functional Product with Limited Users Functional Product with High Growth Mature Product
- Quali sono quindi le vostre attività principali?
- Che enfasi attribuite alle attività di R&S, di innovazione e di leadership tecnologica?
- Avete dei partners chiave che supportano le vostre attività/ value proposition?
- Quali sono i drivers di ricavo principali?
- Quali sono i drivers di costo principali?
- Quanto stimate sia il vostro mercato potenziale ($)?

Less than $100 Million $100 Million - $1 Billion $1 Billion - $10 Billion $10 Billion - $50 Billion $50 - $100 Billion $100 - $500 Billion $500 Billion+

- Quanto stimate sia la quota di mercato massima che potete raggiungere?

<5% 5%-10% 10%-25% 25%-50% 50%-75% 75%-95% 95%-100%

- Qual è l'attuale fatturato mensile?

0 $1-$1K 1K - $10K $10k-$100k $100k-$1 Million $100,000-$1,000,000 $1 Million-$10 Million $10+ Million I prefer not to disclose

- Qual è l'attuale burn rate mensile?

0 $1-$1K 1K - $10K $10k-$100k $100k-$1 Million $100,000-$1,000,000 $1 Million-$10 Million $10+ Million I prefer not to disclose

- Dopo quanto tempo dalla costituzione della società si è raggiunto il BEP?

Not profitable yet - expected in <6 months Not profitable yet - expected in >6 months nei primi 6 mesi nel primo anno nei primi 18 mesi I prefer not to disclose

Sources of funding (if any) indicate type and amount (€k)	Type	Amount
		(€k)
		(€k)
		(€k)

Clienti *(Customers)*

- Chi sono i vostri clienti? Quanti e quali segmenti rappresentano il vostro target?
- What is the minimum number of users that need to be using the product to experience the value proposition? Qual è il minimo numero di utenti che devono usare il prodotto perché abbia valore?

1 2-50 50-100 100-10,000 10,000+

- Quali sono i principali canali di acquisizione clienti?

Affiliate / Lead Generation Biz Dev / Partnerships Blogs (Yours & Others) Campaigns / Contests Direct Sales Domains Email PR Radio SEM SEO Social Media Marketing Sponsorship Telemarketing TV Viral / Referral Widgets Word of Mouth Other

- Chi sono gli utenti del vostro prodotto?

Consumers SMEs Enterprises

- Chi è che paga il vostro prodotto?

Consumers SMEs Enterprises

- Do you have payers that are a completely different customer segment than your users?

No. My users are the same as my payers. Yes. I often monetize my users indirectly.

- Quanti clienti avete attualmente?

- Qual è stata la crescita percentuale nell'ultimo mese? E negli ultimi sei mesi?
- Quali sono i mercati prevalenti?
- Quanto hanno contato e come le vostre esperienze lavorative precedenti nel trovare i clienti attuali?

Concorrenti *(Competitors)*

- Quale strategia competitiva perseguite? ○ Prezzo ◉ Differenziazione ○ Nicchia ○ Innovazione (nessuno ancora lo fa in maniera profittevole)
- È la stessa con cui avete iniziato o avete cambiato? E perché nel caso?
- Avete concorrenti?
- Dove sono localizzati?
- Avete rapporti di collaborazione con alcuni di essi, di che genere nel caso e dove?
- Sono stati anche vostri concorrenti nelle precedenti esperienze lavorative?

Fornitori e partners *(Suppliers and partners)*

- Avete dei fornitori? Dove sono localizzati?
- Avete dei partners? Dove sono localizzati?
- Quali sono stati i driver di scelta di tali fornitori e/o partners?
- Che tipo di rapporti intrattenete con essi?
- Avete mai realizzato delle co-progettazioni?
- Quanto hanno contato e come le vostre esperienze lavorative precedenti nel trovare i fornitori e partners attuali?

Risorse umane (Human resources)

- Quante persone lavorano nell'impresa attualmente? Come sono state selezionate? Dove sono dislocate e perché?
- Quanti fondatori ha l'azienda? In che posizioni?
- Ci sono altri dirigenti non fondatori?
- Come li avete coinvolti?
- Quanti fondatori hanno esperienza tecnica e lavorano sul prodotto?:
- La maggior parte del team è focalizzata su : ◯ Acquisizione e sviluppo base clienti ◯ Sviluppo prodotto ◉ 50/50 ◯ Altro:
- Quanti dirigenti o dipendenti provengono da precedenti esperienze lavorative (indicare quali e con quali ruoli)? E con esperienze nello stesso campo?
- Ritieni che la differenza fra i salari di Usa e Italia sia:

◯ Indifferente ◯ Poco considerevole ◉ Molto considerevole ◯ Enorme

- Quanto hanno contato e come le vostre esperienze lavorative precedenti nel trovare i soci e dipendenti attuali? E dove li avete trovati?

- Quanti mentor avete? Di che nazionalità? Come li avete trovati?

Il processo di internazionalizzazione *(Internationalization process)*

- Quando l'impresa ha iniziato ad internazionalizzarsi?

- Com'è configurata l'azienda? (da perfezionare) ◯ tutta in Italia ◯ Sussidiaria in USA ◯ Sister company ◯ Dual company (holding americana) ◉ Corporation USA

- Quali sono state le principali ragioni per l'internazionalizzazione e la scelta di tale configurazione?

Clientela→espansione mercato	
Finanziamento	
Aspetti legali (es: stock options)	
Mentors	
Contatti precedenti/ conoscenza del mercato estero	
Partners	
Aiuto attivo degli investitori nel business development	
Ricerca dipendenti qualificati e/o a minor costo	
Vicinanza con competitors	
Vicinanza con centri di ricerca	
Vicinanza con fornitori/partners	

- Chi ha deciso, come ha deciso e quali obiettivi si è posto?

- C'è stata una formalizzazione di un piano di crescita internazionale?

- Quali sono i risultati oggi?

Funzioni aziendali chiave	Dislocazione	Perchè
R&D		
Produzione		
Marketing		
Sales		

- Quanto è rischioso oggi internazionalizzare il vostro business e perché?
- Quali sono state le problematiche incontrate?

Identificazione mercati esteri *(Identification of foreign markets)*

- Con quale/i mercati avete iniziato? Perché? Facendo che cosa? (export, commercializzazione, produzione, ecc.)?
- I fondatori o i loro collaboratori avevano conoscenze precedenti dei mercati esteri o relazioni con soggetti esteri che hanno facilitato l'espansione?
- L'approccio ai mercati esteri è stato facilitato dall'esistenza di enti o soggetti locali che hanno offerto il loro aiuto nella raccolta delle informazioni?
- Come è proseguita l'espansione, in quali mercati, perché e come?
- Attualmente in quanti e quali mercati operate?
- % Fatturato export attuale (indicare anche la % di 3 anni fa e 5 anni fa)
- Indicare fatturato e dipendenti delle diverse filiali (se l'azienda ha filiali estere)

Filiale e attività principali	Fatturato	Dipendenti (n° e tipo)	Costo personale (medio)

- Condividete fra le diverse filiali i dati relativi a clienti, fornitori, concorrenti, tecnologie,ecc.?
- Se si, quali sono gli strumenti utilizzati?
- Raccogliete informazioni sui mercati esteri e i trend dei consumatori?

Obiettivi future (Next goals)

- Quali obiettivi avete per il futuro in termini di internazionalizzazione nel medio e lungo termine?
- Quanti nuovi prodotti avete lanciato dall'inizio dell'attività sia nel mercato domestico che internazionale?
- Quanti pensate di lanciare nel futuro?
- Vi sono modifiche, aggiornamenti del servizio/prodotto?
- Da cosa sono dettate queste modifiche?
- Ha intravisto nuove opportunità nei mercati internazionali da sfruttare anche in ambito domestico?
- Quanto questo nel caso ha modificato la business idea originale?
- Quanto ha peso il suo percorso imprenditoriale precedente in tal senso?
- Preferite prendere progetti internazionali a basso rischio/bassi ritorni oppure alto rischio/alto rendimento?

7.1.2 Example of transcript of the interviews for the case study analysis

Transcripts, 7/09/2011

GC: Umberto, possiamo darci del tu? Qui in Silicon Valley i colloqui sono sempre informali.

UM: Assolutamente, ci mancherebbe.

GC: Come ti ho spiegato via mail la finalità dell'intervista è uno studio sulle cause principali che spingono giovani imprenditori a creare la propria aziende con un respiro internazionale fin da subito. Oltre a te intervisterò alcune altre startup, tutte fondate da imprenditori italiani e che hanno già sedi all'estero.

Comincerei chiedendoti alcuni dati personali. Quando sei nato?

UM: Gennaio 1981 compirò 30 anni quest'anno.

GC: Sei residente in Italia?

UM: Sì, Milano.

GC: Mi parli un po' del tuo percorso scolastico? Dove e cosa hai studiato?

UM: Ho fatto il liceo in Italia, poi mi sono trasferito in California per l'università, alla UCLA e poi al MIT. Il MIT è un posto molto estremo, bellissimo per quello che ti consentono di fare per le opportunità che ti offrono, per le persone che incontri, però dall'altra parte incontri anche tanta gente con attitudini sociali molto basse; ricordo di aver incontrato di sabato notte, di rientro da una discoteca persone che ancora lavoravano al pc. La gente ti parla sempre di tecnologia.

GC: Quali sono le tue esperienze lavorative prima di Fluidmesh?

UM: Fluidmesh è stata la mia prima startup, prima di fare questo ho lavorato in McKinsey ma solo per uno stage estivo di tre mesi nel 2003 a Milano. Poi ho iniziato con Fluidmesh mentre ancora ero in università.

GC: Quando l'hai fondata?

UM: Nel 2005 a Boston, dove ha ancora l'headquarter.

GC: Di cosa si occupa Fluidmesh?

UM: Trasmettitori radio per applicazioni di video sorveglianza; ci occupiamo soprattutto della parte software ma curiamo anche la parte hardware.

GC: Com'è nata Fluidmesh?

UM: Mah…al MIT c'era una competizione che si chiamava 50k, adesso si chiama 100k. Noi un po' per gioco abbiamo deciso di partecipare, ci siamo messi a scrivere un business plan su una tecnologia wireless che io conoscevo perché ci facevo la tesi su quella; eravamo con altre persone conosciute al MIT uno delle Bermuda e una Cinese. Eh...abbiamo fatto questo business plan e lo abbiamo mandato…siamo stati fatti fuori al primo giro, subito, neanche il primo passaggio abbiamo fatto, ma mentre facevamo il business plan avevamo fatto tutta una serie di interviste a potenziali clienti, partner e abbiamo trovato un bel po' di gente entusiasta del progetto che volevamo fare, un po' perché provenivamo dal MIT un po' perché..non so perché, comunque questa cosa ci ha dato coraggio e quindi anche se ci hanno buttato fuori al primo giro poi abbiamo continuato e abbiamo fatto un primo prototipo del prodotto e tra l'altro abbiamo di tolto di mezzo le persone, uno perché

voleva fare altro, l'altro perché non lo ritenevamo all'altezza e abbiamo tirato dentro il mio socio attuale che era amico da tanti anni che tra l'altro aveva fondato una società in Italia sempre su tecnologia wireless ma diversa dalla nostra. Allora siamo partiti e abbiamo deciso di metterci tutti insieme

Abbiamo fatto un unico team e siamo in 4 founders: io, mio fratello, Torquato e Andrea. E quindi a quel punto ci siamo ritrovati con una società in Italia che abbiamo ereditato, quella che avevano fondato loro e una in America.

GC: Il prodotto adesso è un prodotto maturo?

UM: Sì assolutamente

GC: Quali sono le attività principali dell'azienda ora, sviluppo, produzione, marketing?

UM: Tutto, commerciale molto, la parte commerciale e il marketing e lo sviluppo software per il prodotto...supporto tecnico.

GC: Un po' di dati quantitativi principalmente…Quali sono i vostri drivers di revenues?

UM: Solo la vendita di dispositivi…poi sì i dispositivi hanno anche una serie di plug-in e di accessori software e hardware che puoi comprare per dare più capacità, però principalmente vendita degli apparati.

GC: Invece i drivers di costo?

UM: Costi commerciali enormi per i nostri venditori che vanno in giro dai rivenditori..costi di management non drammatici, costi di R&S accettabili, costi di produzione abbastanza bassi per un'azienda che vende hardware..

GC: Il mercato potenziale in dollari?

UM: mmhh, dipende da come lo segmenti...se è solo la sorveglianza dovrebbe essere un 200 milioni di dollari, 200-250 se prendi tutto il mondo del wireless hardward tra 1 e 2 miliardi di dollari. Noi ci rivolgiamo ad entrambi ma il nostro successo è nella video sorveglianza.

GC: Che quota di mercato?

UM: Piccola perchè il fatturato è di qualche milione di dollari.

GC: Un range di revenues e costi mensili?

UM: Revenues, metti circa 3 milioni, 3-4 come range e..i costi siamo più o meno in break even abbondante. Il break even lo abbiamo raggiunto l'anno scorso dopo quattro anni.

GC: Fonti di finanziamento?

UM: Tutto tutto abbiamo usato, i nostri soldi, soldi di amici…qualche centinaia, migliaia di euro...noi poche migliaia di euro e..bandi pubblici qualche centinaia di migliaia di euro…banche qualche centinaia di migliaia di euro e adesso è entrato un fondo che ha investito cinque milioni di euro, ehm di dollari. Questo è un fondo di private equity, ha investito ad aprile 2011.

GC: Quanto ti ha aiutato essere già negli Stati Uniti per fare fund raising?

UM: Beh, mi ha aiutato molto perché qui se non fai vedere che tu davvero vuoi trasferirti e mettere su la tua azienda negli Stati Uniti non ti finanziano; l'investitore investe solo se sei vicino e può controllarti. Poi, certo essere qui, anzi aver studiato qui mi ha aiutato molto perché sapevo già a chi rivolgermi, da quali investitori andare. Alcuni di questi li avevo già incrociati in università, poi amici di amici, contatti..

GC: Come mai non avete chiesto soldi in Italia?

UM: Quando siamo partiti in Italia il mercato VC era ancora meno sviluppato di adesso, quindi non c'era molta disponibilità economica; in Italia siamo riusciti a recuperare qualcosa con investimenti pubblici a fondo perduto...quelli ci hanno molto aiutato a partire.

GC: Avete avuto difficoltà all'inizio per la vostra giovane età? Alla fine l'azienda l'avete fondata a 26 anni..

UM: Mah, sì e no nel senso che… forse in Italia fino a qualche anno fa parlare con un venture capitalist a quell'età era un po' difficile, perché comunque non avevi molta credibilità… stessa cosa per le banche.. però per diciamo che abbiamo compensato l'età con la nostra convinzione e determinazione, abbiamo dimostrato che credevamo davvero nel progetto e che eravamo in grado di portarlo avanti… e così abbiamo convinto i parenti e amici che ci hanno dato una bella mano all'inizio; poi per convincere il private equity beh lì l'abbiamo convinto con i fatti, non con l'età.

D'altronde, loro vogliono fare soldi e a differenza delle banche, avendo meno vincoli legali cioè non hanno bisogno per legge di garanzie ecc., puntano molto sul team.. se il team e buono e convincente, anche se sono squattrinati puntano su di te.

GC: Ma a parte la fase di fund raising è stato facile fare business in un nuovo mercato quello degli Stati Uniti?

UM: Beh anche qui certamente aver trascorso alcuni anni negli Stati Uniti anche se da studente ha aiutato.. ora dico se avessi trascorso questi anni lavorando già in business tanto meglio, però anche da studente si impara molto, anche solo i modi di fare, gli approcci, un po' le dinamiche. Poi l'altra cosa è che stando qui comunque inizi a costruire qualche connessione, il tuo amico d'università magari conosce uno che lavora in un'azienda che poi ti può essere utile. In ogni caso certo bisogna recuperare sui contatti, quindi un bello sforzo che abbiamo fatto è stato proprio sul networking, andavamo in giro per conferenze, fiere per iniziare a farci un nome insomma e una rete. La stessa cosa però in Italia, cioè è stato utile comunque avere parte del team in Italia perché abbiamo sfruttato anche le connessioni al Politecnico di Milano; tieni conto che il livello degli ingegneri del Politecnico è molto alto e gli stipendi medi rispetti agli Stati Uniti molto più bassi…qui c'è una richiesta enorme soprattutto di ingegneri informatici, capirai con tutti i giganti high tech…la competizione è altissima; per cui avere contatti con il Polimi e conoscere le persone lì ci ha aiutato molto a sviluppare il nostro prodotto a costi certamente più bassi.

GC: Ma adesso avete ancora dipendenti in Italia?

UM: Certo, tutta la parte di sviluppo prodotto la facciamo in Italia, ad oggi siamo in 15 dipendenti, considera che 7 sono in Italia per lo sviluppo prodotto, poi ne abbiamo 4 nel Nord America per la parte commerciale, uno a Londra e uno in Perù..insomma siamo piuttosto global, no?

GC: Sì, complimenti. Ma le revenues come sono distribuite invece a livello globale?

UM: mmm…allora direi circa un 50% ci viene dal Nord America, il nostro mercato più grande e principale; un quarto, 25% dal Perù e il restante quarto un po' dal resto del mondo.

GC: Scusami, un passo indietro ritorno ancora sui contatti. Avete avuto o avete ancora dei mentor?

UM: Mmhh solo per un periodo, nel senso che abbiamo fatto un periodo di incubazione con Mind the Bridge, che conosci bene immagino, qui abbiamo avuto per tre mesi un mentor che era un professionista nel settore wireless di origini italiane. Sì, lui ci ha aiutato sui contatti, ci ha dato un po' di dritte con la sua esperienza, certo lui ha molti contatti di noi avendo lavorato per anni in Silicon Valley.

Ah, aspetta mi è venuta in mente una cosa rispetto al discorso che facevamo prima, la nostra credibilità con i finanziatori e partner è stata anche aiutata dalla nostra ricerca in MIT, qui conoscono tutti la tecnologia e far vedere che comunque avevamo un track record di risultati scientifici ci ha aiutato.

GC: Questo è molto interessante...ma invece tu ti sei spostato negli Stati Uniti fina da giovanissimo quindi non avevi vincoli famigliari, ma secondo te per la tua esperienza e quello che hai visto, la scelta di creare questo tipo di azienda un po' globale dove fin da subito devi controllare persone in ogni parte del mondo… è una scelta solo "per giovani"?

UM: umh…domanda difficile, non lo so nel senso che, come hai detto tu, io ero giovane e mi è sembrato normale andare lì dove volevo, a studiare nei posti più attrattivi per me… poi la decisione di far partire l'azienda è nata così per gioco, ero qui e l'ho fondata qui non so se dall'Italia poi sarei venuto qui ma penso di sì. In ogni caso forse lasciare il tutto per tutto se hai una famiglia è un po' più complicato…se vuoi lo fai, però forse ci pensi su due volte invece che una.

GC: Perfetto, grazie mille il tuo aiuto è stato davvero prezioso. Ci risentiamo via mail per i prossimi appuntamenti.

UM: Grazie a te figurati.

7.2 Questionnaire

7.2.1 Online questionnaire

First section: general information

Born Global Firms Survey

* Required

Company name *

Year of establishment *

Country of establishment *

Which category do you belong to? *

- Advertising
- Ecommerce
- Enterprise
- Games_video
- Mobile
- Network_hosting
- Search
- Security
- Software
- Web

Do you sell your products or do you have people working for your company in foreign countries? *

- Yes
- No

Continue »

Second section: questions about the international market.

Foreign markets

In how many Countries is your company involved in?
(Consider involved in a Country if your company sells products in that Country or has people employed in that Country)

When did you begin to expand your company international?
- ○ From the year of company foundation
- ○ 1 year after the foundation
- ○ 2 years after the foundation
- ○ 3 years after the foundation
- ○ after 3 years
- ○ Other:

Can you write the different Countries you entered according to the order of entry?

How many employees worked for your company when you decided to get international?

How many employees work for your company now?
(If you know, write the percentage for each country)

Why did you decide this expansion path?
Select which factors drove your expansion path, where 1="Not conidered factors" and 5="very important factor"

	1	2	3	4	5
Geographic proximity	○	○	○	○	○
Previous contacts in those countries	○	○	○	○	○
Similar culture	○	○	○	○	○
Language knowledge	○	○	○	○	○
Similar legal system	○	○	○	○	○
Growing market in those countries	○	○	○	○	○
Similar customer behaviour	○	○	○	○	○
University quality in those countries	○	○	○	○	○
Average salaries in those countries	○	○	○	○	○

Which is the percentage of revenues from foreign markets?
- ○ < 5%
- ○ 5-10%
- ○ 11-25%
- ○ >25%

Which are the factors that drove you to an early internationalization?

1= "not important at all"; 5= "very important"

	1	2	3	4	5
Little home market	○	○	○	○	○
Niche market	○	○	○	○	○
Domestic inertia	○	○	○	○	○
High competition in home market	○	○	○	○	○
Stage of industry evolution in the new market	○	○	○	○	○
Low level of industry concentration	○	○	○	○	○
Easier accessibility to VC in the new market	○	○	○	○	○
Low Regime of appropriability in the home Country	○	○	○	○	○
Low tendency to innovation of the home country	○	○	○	○	○
Law availability of VC money in home Country	○	○	○	○	○
Easly scalable product	○	○	○	○	○

« Back Continue »

Third section: questions about the respondent and the other co-founders.

Entrepreneur

How many co-founders and managers were you when you decided to internationalize? *

○ 1
○ 2
○ 3
○ 4

About you

Which is your role in the company?

○ CEO
○ CFO
○ CTO
○ CMO
○ Other:

Age of birth

What level of education have you completed?

○ None
○ High School
○ Bachelor's degree
○ Master's degree
○ PhD
○ MBA
○ Other:

Have you studied abroad? Where?

What type of education do you have?

- ○ Business
- ○ Engineering/Natural science
- ○ Humanities
- ○ Social sciences
- ○ Other:

Which languages do you know?

- ☐ English
- ☐ Spanish
- ☐ French
- ☐ Italian
- ☐ German
- ☐ Chinese
- ☐ Hindi
- ☐ Japanese
- ☐ Other:

Select which experiences you had:

- ☐ Co-founder of another start up
- ☐ Employee of another start up
- ☐ Co-founder of another strat up that have internationalized
- ☐ Employee of another start up that have internationalized
- ☐ Experience in the same industry
- ☐ Other:

In your opinion, which of these characteristics of a manager are foundamental to internationalize?

1="not important at all" and 5="fundamental"

	1	2	3	4
Knowledge of foreign languages	○	○	○	○
Knowledge of foreign languages	○	○	○	○
Having an international network	○	○	○	○
International work experience	○	○	○	○
Motivation	○	○	○	○

« Back Continue »

Other Co-founder

Which is his/her role in the company?
- ○ CEO
- ○ CFO
- ○ CTO
- ○ CMO
- ○ Other:

Age of birth

What level of education has your co-founder completed?
- ○ None
- ○ High School
- ○ Bachelor's degree
- ○ Master's degree
- ○ PhD
- ○ MBA
- ○ Other:

Has he/she studied abroad? Where?

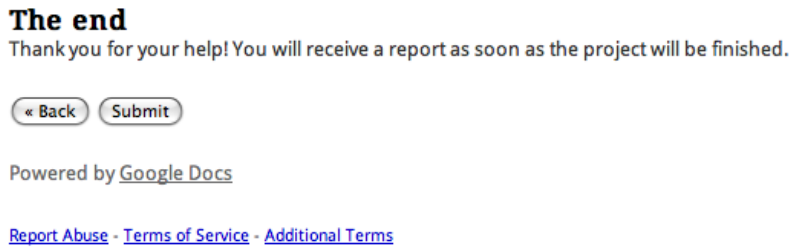
What type of education does he/she have?
- ○ Business
- ○ Engineering/Natural science
- ○ Humanities
- ○ Social sciences
- ○ Other:

Which languages does he/she know?
- ☐ English
- ☐ Spanish
- ☐ French
- ☐ Italian
- ☐ German
- ☐ Chinese
- ☐ Hindi
- ☐ Japanese
- ☐ Other:

Select which experiences he had:
- ☐ Co-founder of another strat up
- ☐ Employee of another start up
- ☐ Co-founder of another strat up that have internationalized
- ☐ Employee of another start up that have internationalized
- ☐ Experience in the same industry
- ☐ Other:

« Back Continue »

Final part: Acknowledgements



7.2.2 Codification of textual answers

Variable	Values	Codes
Category_Cod	Advertising	1
	Ecommerce	2
	Enterprise	3
	Games_Video	4
	Mobile	5
	Network_Hosting	6
	Search	7
	Securuty	8
	Software	9
	Web	10
Country_Of_Establishment_Cod	Africa	1
	Central America	2
	Eastern Asia	3
	Eastern Europe	4
	North America	5
	Nothern Europe	6
	Oceania	7
	South America	8
	South Asia	9
	Southern Europe	10
	SouthEastern Asia	11
	Western Asia	12
	Western Europe	13
	More	14
Number_Coutries_Involved_Cod	1	1
	2-4	2
	5-9	3
	10-19	4
	20-29	5
	30-49	6
	50-99	7
	100-149	8
	150-200	9
	>200	10

Internationalization_Starting_Time_		
Cod	From the year of company establ.	1
	One year after the foundation	2
	Two years after the foundation	3
	Three years after the foundation	4
	After three years 5	5
First_Country_Entered_Cod		
	Africa	1
	Central America	2
	Eastern Asia	3
	Eastern Europe	4
	North America	5
	Nothern Europe	6
	Oceania	7
	South America	8
	South Asia	9
	Southern Europe	10
	SouthEastern Asia	11
	Western Asia	12
	Western Europe	13
	More	14
Second_Country_Entered_Cod Africa		
	Africa	1
	Central America	2
	Eastern Asia	3
	Eastern Europe	4
	North America	5
	Nothern Europe	6
	Oceania	7
	South America	8
	South Asia	9
	Southern Europe	10
	SouthEastern Asia	11
	Western Asia	12
	Western Europe	13
	More	14
Number_Employees_At_Internationalization_		
	1	1
	2-5	2
	6-10	3
	11-15	4
	16-25	5
	26-50	6
	>50	7
Number_Employees_Now_Cod		

	1	1
	2-5	2
	6-10	3
	11-15	4
	16-25	5
	26-50	6
	>50	7
Role1_Cod		
	CEO	1
	COO	2
	CMO	3
	CTO	4
	CIO	5
	CSO	6
	CVO	7
	CCO	8
	CRO	9
	CPO	10
	CFO	11
	GM	12
	Other	13
Level_Education1_Cod		
	High School	1
	Some years	2
	Bachelor's Degree	3
	Master's Degree	4
	PhD	5
	MBA	6
Where_Abroad_Uno1_Cod		
	Africa	1
	Central America	2
	Eastern Asia	3
	Eastern Europe	4
	North America	5
	Nothern Europe	6
	Oceania	7
	South America	8
	South Asia	9
	Southern Europe	10
	SouthEastern Asia	11
	Western Asia	12
	Western Europe	13
	More	14
Where_Abroad_Due1_Cod		
	Africa	1
	Central America	2
	Eastern Asia	3

Eastern Europe	4
North America	5
Nothern Europe	6
Oceania	7
South America	8
South Asia	9
Southern Europe	10
SouthEastern Asia	11
Western Asia	12
Western Europe	13
More	14

7.3 Antecedents of early internationalization

7.3.1 Definition of variables used in the empirical analysis to test the antecedents of early internationalization (extent, speed, scope)

Dependent variables	
BGs	Dummy variable that is equal to 1 for firms which started their foreign operations within 3 years of inception and have derived at least 25% of their turnover from outside their home market within 3 years; 0 otherwise
BGs_H	Dummy variable that is equal to 1 for BGs which have an international presence in more than 10 countries; 0 otherwise
Independent variables	
Home Country Conditions	
MARKET SIZE	5-points Likert scale to assess the weight attributed to the small domestic market as a reason to start internationalization
COMPETITION	5-points Likert scale to assess the weight attributed to the high competition in the home market as a reason to start internationalization
PRIVATE EQUITY FINANCING	5-points Likert scale to assess the weight attributed to the limited availability of private equity financing in the home market as a reason to start internationalization
INDUSTRY DYNAMISM	5-points Likert scale to assess the weight attributed to an industry with a growth potential as a reason to start internationalization
INNOVATION	5-points Likert scale to assess the weight attributed to a low tendency to innovate in the

	home market as a reason to start internationalization
APPROPRIABILITY REGIME	5-points Likert scale to assess the weight attributed to a weak patent protection in the home market as a reason to start internationalization
Entrepreneur	
EDUCATION	Dummy variable which takes value 1 if the entrepreneur has a Master Degree or a Ph.D and 0 otherwise
AGE	Average age of the firm's entrepreneurs at the internationalization time
FOREIGN LANGUAGES	Number of languages spoken by the entrepreneur
INTERNATIONAL EXPERIENCE	5-points Likert scale to assess the weight attributed to a previous international experience of the entrepreneur as a reason to start internationalization
INDUSTRY EXPERIENCE	Dummy variable which takes value 1 if the entrepreneur has a previous experience in the industry as his current firm; 0 otherwise
STUDY ABROAD	Dummy variable which takes value 1 if the entrepreneur has studied abroad and 0 otherwise
INTERNATIONAL COMMITMENT	5-points Likert scale to assess the weight attributed to the international commitment as a reason to start internationalization
Network relationships	
NETWORK RELATIONSHIPS	5-points Likert scale to assess the weight attributed to the presence of an international network of the entrepreneur as a reason to start internationalization
Firm attributes	
NICHE ORIENTATION	5-points Likert scale to assess the weight attributed to the niche strategy as a reason to start internationalization
SCALABLE PRODUCT	5-points Likert scale to assess the weight attributed to having a scalable product as a reason to start internationalization
TEAM COMPETENCES	Dummy variable equal to 1 if among the management team there are at least two different education backgrounds (engineering, natural science, computer science, humanities)
SIZE	Logarithm number of employees at the time of internationalization, proxing the organizational flexibility of the firm.
Controls	
LEGALITY INDEX	Based on Berkowitz et al. (2003) principal component analysis, following La Porta et al. (1998), it refers to the weighted average of the efficiency of judicial system, rule of law, corruption, risk of expropriation and risk of

	contract repudiation at country level
ENTREPRENEURIAL ORIENTATION	Average scores on four questions from the Global Entrepreneurship Monitor's (GEM's) Adult Population survey, as in Danis, De Clercq, & Petricevic (2011). The four questions refer to the following dimensions at country level: entrepreneurship as desirable career choice, high status successful entrepreneurship, media attention for entrepreneurship and perceived opportunities.
MSCI	Morgan Stanley Capital International (MSCI) annual index returns for the home country-specific stock markets, measured in the year of the internationalization. Annual returns are used. The index applies country weights based on gross domestic product (GDP).

7.3.2 Probit model on the probability that a start-up internationalizes from its inception

VARIABLES	Model	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)	(6)
MARKET SIZE	0.130***	0.130***	0.139**	0.143**	0.115**	0.117**
	(0.050)	(0.050)	(0.056)	(0.056)	(0.058)	(0.058)
COMPETITION	-0.196***	-0.192***	-0.166**	-0.168**	-0.162**	-0.163**
	(0.063)	(0.063)	(0.073)	(0.073)	(0.075)	(0.075)
INNOVATION	-0.036	-0.033	-0.062	-0.062	-0.092	-0.093
	(0.067)	(0.068)	(0.076)	(0.076)	(0.077)	(0.077)
APPROPRIABILITY REGIME	0.026	0.024	-0.003	0.000	0.001	0.002
	(0.083)	(0.083)	(0.091)	(0.091)	(0.091)	(0.091)
INDUSTRY DYNAMISM	0.011	0.010	0.014	0.016	-0.014	-0.012
	(0.048)	(0.048)	(0.054)	(0.054)	(0.055)	(0.055)
PRIVATE EQUITY FINANCING	0.046	0.039	0.056	0.048	0.061	0.056
	(0.057)	(0.057)	(0.065)	(0.065)	(0.065)	(0.065)
NETWORK RELATIONSHIPS			0.117**	0.113**	0.098*	0.094*
			(0.056)	(0.056)	(0.058)	(0.058)
INTERNATIONAL COMMITTMENT			0.145	0.129	0.117	0.101
			(0.134)	(0.132)	(0.137)	(0.136)
INTERNATIONAL EXPERIENCE			0.031	0.035	0.028	0.031
			(0.045)	(0.045)	(0.046)	(0.046)
STUDY ABROAD			-0.174	-0.176	-0.213	-0.215
			(0.161)	(0.161)	(0.164)	(0.164)
EDUCATION			0.309	0.282	0.397	0.373
			(0.263)	(0.264)	(0.268)	(0.269)
INDUSTRY EXPERIENCE			0.023	0.021	0.026	0.024
			(0.151)	(0.151)	(0.153)	(0.153)
AGE			-0.003	-0.003	-0.003	-0.003
			(0.010)	(0.010)	(0.010)	(0.010)
FOREIGN LANGUAGES			0.141*	0.143*	0.164**	0.166**
			(0.075)	(0.076)	(0.077)	(0.078)
NICHE ORIENTATION					0.084*	0.086*
					(0.051)	(0.051)

SCALABLE PRODUCT					0.145**	0.148**
					(0.066)	(0.066)
TEAM COMPETENCES					-0.081	-0.081
					(0.154)	(0.155)
SIZE					-0.010	-0.010
					(0.013)	(0.013)
LEGALITY INDEX	0.030	0.028	0.020	0.018	0.014	0.013
	(0.021)	(0.021)	(0.024)	(0.023)	(0.024)	(0.024)
ENTREPRENEURIAL ORIENTATION	0.016*	0.017*	0.017*	0.017*	0.017*	0.017*
	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
YEAR	-0.039		-0.047		-0.042	
	(0.034)		(0.036)		(0.037)	
MSCI		-0.026		-0.015		-0.017
		(0.021)		(0.023)		(0.023)
Sector dummies	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes
Constant	77.801	-1.946*	89.412	-3.721***	80.932	-4.102***
	(68.401)	(1.028)	(73.005)	(1.436)	(74.439)	(1.452)
Observations	445	445	445	445	445	445
Pseudo R-squared	0.128	0.128	0.164	0.161	0.181	0.179

Note. Dependent variable: BGs. The regressions contain industry and country dummies (not reported to save space).Standard errors in parenthesis. Significant coefficients are indicated by *(10% level), **(5% level) and ***(1% level).

7.3.3 Probit model on the probability that a born global displays a high degree of born globalness

VARIABLES	Model	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)	(6)
MARKET SIZE	0.111*	0.102*	0.086	0.079	0.096	0.092
	(0.062)	(0.062)	(0.072)	(0.070)	(0.078)	(0.077)
COMPETITION	-0.092	-0.108	-0.005	-0.017	-0.066	-0.084
	(0.085)	(0.086)	(0.098)	(0.099)	(0.105)	(0.106)
INNOVATION	0.082	0.090	0.165	0.177*	0.231**	0.253**
	(0.084)	(0.084)	(0.102)	(0.102)	(0.110)	(0.111)
APPROPRIABILITY REGIME	0.068	0.056	-0.005	-0.022	-0.027	-0.050
	(0.098)	(0.098)	(0.113)	(0.114)	(0.121)	(0.122)
INDUSTRY DYNAMISM	-0.031	-0.029	-0.049	-0.048	-0.058	-0.055
	(0.061)	(0.061)	(0.070)	(0.070)	(0.073)	(0.073)
PRIVATE EQUITY FINANCING	-0.124	-0.096	-0.110	-0.095	-0.152	-0.137
	(0.070)	(0.068)	(0.079)	(0.077)	(0.084)	(0.083)
NETWORK RELATIONSHIPS			0.157**	0.159**	0.195**	0.202**
			(0.074)	(0.074)	(0.080)	(0.080)
INTERNATIONAL COMMITTMENT			0.313	0.351	0.380*	0.420*
			(0.219)	(0.218)	(0.226)	(0.226)
INTERNATIONAL EXPERIENCE			0.123**	0.119**	0.134**	0.130**
			(0.057)	(0.057)	(0.060)	(0.060)
STUDY ABROAD			0.410*	0.352	0.491**	0.433*
			(0.223)	(0.221)	(0.237)	(0.235)
EDUCATION			-0.714*	-0.719*	-0.641	-0.681
			(0.405)	(0.408)	(0.430)	(0.437)
INDUSTRY EXPERIENCE			-0.020	-0.057	-0.051	-0.093
			(0.200)	(0.201)	(0.207)	(0.207)
AGE			0.024*	0.023*	0.027**	0.027**

			(0.013)	(0.013)	(0.013)	(0.014)
FOREIGN LANGUAGES			0.012	0.030	0.058	0.079
			(0.097)	(0.097)	(0.101)	(0.100)
NICHE ORIENTATION					0.131**	0.118*
					(0.066)	(0.066)
SCALABLE PRODUCT					-0.092	-0.103
					(0.104)	(0.104)
TEAM COMPETENCES					0.409*	0.443**
					(0.219)	(0.220)
SIZE					-0.056***	-0.058***
					(0.020)	(0.020)
LEGALITY INDEX	0.070**	0.070**	0.061*	0.057*	0.035	0.031
	(0.029)	(0.029)	(0.033)	(0.033)	(0.036)	(0.035)
ENTREPRENEURIAL ORIENTATION	0.018*	0.017*	0.013**	0.013**	0.012**	0.013**
	(0.015)	(0.015)	(0.025)	(0.025)	(0.026)	(0.026)
YEAR	0.095*		0.073		0.088	
	(0.052)		(0.060)		(0.061)	
MSCI		0.033		0.038		0.051
		(0.027)		(0.030)		(0.032)
Sector dummies	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes
Constant	-193.176*	-2.421*	-151.415	-5.527***	-181.572	-6.273***
	(105.458)	(1.278)	(119.329)	(1.876)	(122.514)	(1.950)
Observations	267	267	267	267	267	267
Pseudo R-squared	0.109	0.105	0.166	0.166	0.219	0.220

Note. Dependent variable: BGs_H. The regressions contain industry and country dummies (not reported to save space).Standard errors in parenthesis. Significant coefficients are indicated by *(10% level), **(5% level) and ***(1% level).

7.4 Antecedents of country attractiveness for high tech start-ups

7.4.1 Definition of variables used in the empirical analysis to test the gravity model

Dependent Variable	
FLOW INTENSITY$_{ij}$	Number of firms established in country *i* which choose to enter country *j* as a first country of entry.
Independent Variables	
GDP$_i$	GDP of country *i* in 2011 (logarithm). Source: World Economic Outlook, IMF.
GDP$_j$	GDP of country *j* in 2011 (logarithm). Source: World Economic Outlook, IMF.
PATENTS$_i$	Total number of patent applications in country *i* until the year 2011 (logarithm). Source: Thomson Innovation database, Thomson Reuters.
PATENTS$_j$	Total number of patent applications in country *j* until the year 2011 (logarithm). Source: Thomson Innovation database, Thomson Reuters.
DIST$_{ij}$	The variable refers to the latitude and longitude of the most populated cities. Source: CEPII database.
DIST_CAPITAL$_{ij}$	The variable refers to the latitude and longitude of capital cities. Source: CEPII database.

$DIST\_WEIGHTED_{ij}$	The variable is a weighted (by the share of country population) measure of the distances of the most populated cities. Source: CEPII database.
$TIME\ ZONE_{ij}$	Time difference in hours between the capital cities of countries *i* and *j*. This variable ranges from 0 to 12. Source: CEPII database.
COMMON LANG (0,1)	Dummy variable which takes value 1 if country *i* and country *j* share the same language. Source: CEPII database.
COLONY (0,1)	Dummy variable which takes value 1 if country *i* and country *j* have ever had a colonial relationship. Source: CEPII database.
COMMON LEGAL (0,1)	Dummy variable which takes value 1 if country *i* and country *j* share the same legal origin. Source: CEPII database.
$IPR\ PROTECTION_j$	The Index of Patent Rights Park (2008) for country *j* ranges from 0 to 5. It is the un-weighted sum of the figures for five different aspects of protection of patent rights (extent of coverage, membership of international treaties, duration of protection, absence of restrictions on rights and statutory enforcement provisions). Source: Park, 2008.
$INVESTOR\ PROTECTION_j$	The investor protection index for country *j* ranges from 0 to 10, with higher values indicating more investor protection. The index considers the transparency of related-party transactions, the liability for self-dealing and the shareholders' ability to sue officers and directors for misconduct. Source: Doing Business Report 2013, World Bank.
$COST\ ENFORCEMENT_j$	Average costs (court costs, enforcement costs, attorney fees) involved in resolving a commercial dispute in country *j*. Source: Doing Business Report 2013, World Bank.
$VC\ AMOUNT_j$	Amount of capital invested in VC deals in country *j* in year 2011 (logarithm). Source: Venture Source, Down Jones.
$COST\ EXPORT_i$	Average cost to complete the procedures to export the goods for country *i* (logarithm). The cost includes costs for documents, administrative fees for customs clearance and inspections, customs broker fees, port-related charges and inland transport costs. Source: Doing Business Report 2013, World Bank.
FDI_j	FDI stock for country *j* in year 2011 (logarithm). Source: Unctadstat database, UNCTAD
$EXPORT_j$	Total exports for country *j* in year 2011 (logarithm). Source: International Trade Statistics report, WTO

7.4.2 Gravity model to test the factors influencing the internationalization flows of high-tech start-ups. OLS and Poisson estimates

	OLS			POISSON	
VARIABLES	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)
GDP_i	-0.659***	-0.266	-0.432*	-0.026	-0.057**
	(0.193)	(0.196)	(0.230)	(0.027)	(0.028)
GDP_j	-0.261	0.261	-0.318	-0.004	-0.128***
	(0.205)	(0.237)	(0.260)	(0.030)	(0.035)
$PATENTS_i$	1.373***	1.295***	1.285***	0.184***	0.158***
	(0.166)	(0.191)	(0.208)	(0.018)	(0.021)
$PATENTS_j$	1.580***	1.452***	0.752**	0.269***	0.118***
	(0.187)	(0.209)	(0.350)	(0.026)	(0.038)

$DIST_{ij}$	-0.616**	-0.668**	-0.681*	-0.120***	-0.080*
	(0.270)	(0.308)	(0.365)	(0.028)	(0.044)
COMMON LANG		1.383	0.451	0.194	0.112
		(0.859)	(0.835)	(0.104)	(0.095)
COLONY		5.340***	4.829***	0.695***	0.546***
		(0.791)	(0.792)	(0.072)	(0.085)
COMMON LEGAL		5.989***	7.040***	0.629***	0.690***
		(0.897)	(0.916)	(0.088)	(0.087)
IPR $PROTECTION_j$			3.295**		0.499**
			(1.634)		(0.216)
VC $AMOUNT_j$			0.516**		0.101***
			(0.222)		(0.030)
INVESTOR $PROTECTION_j$			0.823**		0.117**
			(0.388)		(0.055)
COST $ENFORCEMENT_j$			-0.184*		-0.007
			(0.110)		(0.013)
COST $EXPORT_i$			-3.509**		-0.236*
			(1.672)		(0.144)
FDI_j			-1.622*		-0.245**
			(0.884)		(0.122)
$EXPORT_j$			0.796		0.183
			(0.867)		(0.117)
Country dummies i	yes	yes	yes	yes	yes
Country dummies j	yes	yes	yes	yes	yes
Constant	-13.875**	-24.952***	4.878	-3.309***	-1.313
	(5.963)	(5.991)	(16.445)	(0.803)	(1.986)
Observations	310	310	310	310	310
R-squared	0.444	0.734	0.796		
Pseudo R-squared				0.6039	0.6259

Note: The dependent variable is FLOW $INTENSITY_{ij}$. Standard errors are in parenthesis. Country dummies (*i* and *j*) are not reported to save space. ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

PART II – APPENDED PAPERS

Paper 1: Born global companies founded by young entrepreneurs. A multiple case study

Paper 2: Born globals: a cross-country survey on high-tech start-ups

Paper 3: Internationalization flows of high-tech start-ups: a gravity model

Int. J. , Vol. x, No. x, xxxx 1

BORN GLOBAL COMPANIES FOUNDED BY YOUNG ENTREPRENEURS. A MULTIPLE CASE STUDY

ABSTRACT
Based on a multiple case study research, the paper aims at providing some first evidence on the phenomenon of "born global" companies (BGCs), i.e. companies that internationalise their activities from inception or shortly thereafter, founded by young entrepreneurs, by analysing those age-related factors that facilitate or hinder young entrepreneurs to start a BGC. An in-depth qualitative analysis has been performed based on eight BGCs founded by Italian young entrepreneurs. Results highlight that young entrepreneurs, being more financially constrained than old entrepreneurs, tend to move towards countries where those resources are more easily and widely available. Moreover, we found that young entrepreneurs seem to invest heavily on their social capital to countervail the young age effect. Finally, results suggest that - for young entrepreneurs - prior experience abroad has amplified relevance in the internationalization process of a company.

Keywords: *Entrepreneurship, Start-ups, Born-globals, Internationalization, Young Entrepreneurs, Case-Study, High-tech companies, Innovation.*

INTRODUCTION

In the past two decades, the phenomenon of "born global[1]" firms, i.e. companies that internationalise their activities from inception or shortly thereafter, has been investigated under various aspects in several articles studying the internationalization process of firms (Gabrielsson et al., 2008). In recent years, traditional internationalization incremental models (Johanson and Valhne, 1977; Vernon, 1966), according to which firms go international gradually, have drawn criticisms (Knight and Cavusgil, 1996; Madsen and Servais, 1997). Knight and Cavugsil (1996) point out the failure of the stage-models to account for the rise of Born Global Companies (BGCs), which go international very shortly after the inception skipping several stages of internationalisation. BGCs are emerging worldwide as an important phenomenon. Since the late 1980s, several studies have been carried out on this topic, searching for the factors that made this fast rate of internationalisation possible, investigating on the influence of the characteristics of the industry/segment (Freeman and Cavusgil, 2007; Jolly et al., 1992), the knowledge of markets and customers (Laanti et al., 2007), the access to network links (Chetty and Campbell-Hunt, 2004; Madsen and Servais, 1997; McDougall et al., 1994; Zain and Ng, 2006), the increasing uncertainty and dynamism of the firm's environment (Laanti et al., 2007; Oviatt and McDougall, 2000; Rasmussen and Madsen, 2002), the entrepreneur's and managers' previous international experience (Evangelista, 2005; McDougall et al., 2003; Zucchella et al., 2007) and the prior entrepreneurial experience (Onetti et al., 2010; Presutti et al., 2008). This stream of literature is rich in terms of conceptual/theoretical and of empirical or case studies contributions, but is still fragmented (Rialp et al., 2005). Most importantly, although several human and social factors which can influence the choice and the capability to start a BGC are related to a certain extent to the entrepreneur's age, there is a lack of studies which approach the BGC phenomenon through the lenses of young entrepreneurship literature. This gap originates from the relative novelty of the field of young entrepreneurship (Gielnik et al., 2012). According to GEM Adult Population Survey (Kelley et al., 2012), in the world, there are 165 million young early stage entrepreneurs, namely between the ages of 18 and 35. Despite the increasing dimension of the phenomenon and its increasing recognition by policy makers and practitioners (Cassia et al., 2012), the literature does not offer clear and comprehensive empirical evidence and theories to explain the specificities of young and innovative entrepreneurship (Frosch, 2011; Giacon and Muffatto, 2012).
Thus, this paper aims at contributing to the entrepreneurship literature by investigating, through a qualitative explorative study, the antecedents of BGCs under the young entrepreneurship lenses. More specifically, the goal is to identify how

[1] Scholars also may also refer to this phenomenon with similar terms, such as "global startup" (Oviatt and McDougall, 1995), "instant global entrepreneurship" (Katz et al., 2003), "international new venture - INV" (McDougall, 1994; Oviatt and McDougall, 1994), "early internationalizing firms" (Rialp et al., 2005). According to the definition provided in this paper we decide to refer to the term "born global" since this term appears to be most frequently adopted in researches carried on this topic (or in literature).

entrepreneurs' age impacts the process of early internationalization of companies. Hence, the main research questions we address are 1) which are the age-related factors that facilitate young entrepreneurs to establish a BGC and 2) which are those age-related factors that hinder young entrepreneurs to start a BGC and how they try to overcome and countervail the age effect.
Moreover, the paper adds novelty to the existing literature by analysing a phenomenon that lies at the intersection among international business, international entrepreneurship, and young entrepreneurship literature and which is not yet been explored in these terms. In particular the main theoretical framework we refer to, while analysing the BGCs' phenomenon, is the international entrepreneurship (IE) approach.
The paper focuses on born global companies founded by Italian young entrepreneurs that showed an early internationalisation towards the United States. We performed an in-depth qualitative analysis on eight case studies. This research adds to the existing literature by identifying how the early internationalization of firms is affected by age-related drivers concerning the financial, emotional and social capital dimensions.

The paper is structured in five sections. Initially we provide a comprehensive literature review on BGCs, international entrepreneurship and young entrepreneurship. Then the research methodology is described. Results and propositions are presented in the final sections (case study description and cross case analysis/findings discussion). Theoretical and research implications complete the paper.

BORN GLOBAL COMPANIES, INTERNATIONAL ENTREPRENEURSHIP AND THE YOUNG ENTREPRENEURSHIP APPROACH – THEORETICAL FRAMEWORK

In the last two decades the traditional stage models of firm's international development started to be questioned (Knight and Cavusgil, 1996; Madsen and Servais, 1997). Historically, only large size companies were associated to multi-nationality, due to the need of big economies of scale in R&D, production, marketing and other business areas in order to efficiently manage a multinational expansion (Chandler, 1986). Several are the changes in the international environment which allowed companies to start the international expansion in the very first years of their life cycle (Oviatt and McDougall, 1994; 2000); among these factors, the technological advances in production, communication and transportation; the increasing homogenization of some industries; the increased importance of global networks and alliances; the international human capital mobility (Knight and Cavusgil, 1996; Madsen and Servais, 1997; Servais and Rasmussen, 2000). The increasing dimension of this phenomenon has attracted the interest of several researchers to investigate on the drivers of these new typologies of firms defined by Knight and Cavusgil (1996) as Born Global Companies, "business organizations that, from or near their founding, seek superior international business performance from the application of knowledge based resources to the sale of outputs in multiple countries". According to such definition, several conceptual frameworks, aiming at investigating the antecedents and drivers of the development of born global firms, have been developed in literature. Major factors leading to early internationalization of firms identified in literature can be categorised in: *Industry specific*, i.e. high-tech industries or niche markets usually assure flexibility and speed of response to the firm (Freeman and Cavusgil, 2007; Ibeh, 2003; Jolly et al., 1992; Madsen and Servais, 1997; Preece et al., 1998; Zucchella, 2001); *Firm specific*, i.e. the entry in foreign markets is correlated to the internal capabilities of the firm (Autio et al., 2000; McDougall et al., 1994); *Macroeconomic issues*, e.g. uncertainty and dynamism of the firm's business and environment, technology pace, regulations, trade barriers, etc. (Laanti et al., 2007; Oviatt and McDougall, 2000; Rasmussen and Madsen, 2002); and *Human* and *Social Capital* related drivers (Chetty and Campbell-Hunt, 2004; Laanti et al., 2007; Madsen and Servais, 1997; McDougall et al., 1994; Zain and Ng, 2006; Presutti et al., 2007; Zucchella et al., 2007) as, due to the lack of resources to control its owned assets, the firm has to rely on hybrid or alternative governance structures to gain access to key complementary assets.
Among different approaches to the BG phenomenon, in this paper we apply the International Entrepreneurship (IE) literature as theoretical framework. According to Oviatt and McDougall (2000, p. 903), entrepreneurship has a positive influence on growth and performance of BGCs. International entrepreneurship may be defined as "…a combination of innovative, proactive and risk-seeking behaviour that crosses national borders and is intended to create value in organizations". Special attention is devoted to the entrepreneur-specific factors because they play a major role in early internationalization of firms. Many studies that dealt with this issue highlight a positive relationship between the growth of firms within foreign markets and the entrepreneurs' international orientation, previous job and entrepreneurial experience, networking attitude (Cannone and Ughetto, 2013; Ibeh and Young, 2001; Kuemmerle, 2002; Westhead et al., 2001). Decisions are made by individuals and are influenced by individual-related characteristics. This is

particularly true when considering small firms (Bloodgood, Sapienza and Almeida, 1996; Westhead et al., 2001). The different ways the entrepreneur select information/knowledge (Liesch and Knight, 1999), leverage personal business network (Madsen and Servais, 1997) and exploit strategic opportunities (Venkataraman, 1997) is crucial to understand company's development/growth path. Other studies, that focus on international small firms, analyse how entrepreneurs' personal life experiences (such as previous work and entrepreneurial experience abroad, international experience acquired travelling or studying abroad, high level of education and knowledge of foreign languages) affect their own companies' international orientation (Ditch et al., 1984; Ibeh, 2003; Zahra et al., 2005; Zucchella et al., 2007). Although scholars have identified the importance of entrepreneurial characteristics/attitude in defining BGCs, the phenomenon has not been investigated under the young entrepreneurship lenses. Different aspects related to the young age may directly or indirectly influence the choice to start the BGCs internationalization process. However, this lack of contributions regarding the relation between being young entrepreneurs and BGCs derives from the existent gap on the literature whereas studies that investigate specifically this sub-set of entrepreneurs are still missing (Gielnik et al., 2012; Lewis and Massey, 2003; Schoof, 2006); furthermore, the few academic contributions do not appear in the top journals of business administration and entrepreneurship (Chiungta, 2002; Lewis and Massey, 2003; Schoof, 2006). It is also important to stress that the focus of the study is on first generation entrepreneurs, meaning those who create a new venture, having non enterprising parents (Giacon and Muffatto, 2012). Indeed, studies on second and third generation entrepreneurs are characterized by different dynamics and consequently they are the focus of the family business research stream (Chlosta et al., 2012).

Drawing on this conceptual framework, we jointly analyzed the major factors leading to early internationalization of firms and the main distinctive features that literature attributes to international entrepreneurs and to young entrepreneurs.

A first aspect we focused on is related to the amount of financial resources young entrepreneurs can rely on or access to. If at the very early stage of the startup many ventures rely on internal sources, principally using the resources of the founders and their families and friends (Freear et al., 1995a; 1995b), external financial resources are fundamental to scale a new company. As largely recognized by the entrepreneurship literature, the sources to finance high-tech innovative startups are different from the financial sources generally adopted by traditional business; indeed the high risk involved in a high-tech startup will require a return that is higher than the parameters imposed by usury laws (Zider, 1998). This structure of capital markets makes equity and operators such as business angels and venture capitalists the most common sources of external capital for high-tech startups. Young entrepreneurs face greater difficulties in the fund raising phase (Atieno, 2009; Ierapetritis et al., 2010; Shoof, 2006) for two reasons: first because they usually have limited financial availability (assets to be used as collateral), compared to old or serial entrepreneurs, hence they may tend to anticipate the recur to external sources; the second reason is that not having a track record as entrepreneur they lack credibility from financial actors (Stevenson, 1987). The consequence is that young entrepreneurs need to access external financial resources earlier than old entrepreneurs but, at the same time, they find the fund raising more difficult.

The second relevant aspect to our analysis concerns the trade-off between risk and responsibility. As stated by Timmons and Spinelli (2010), risk aversion and the adoption of responsible behaviours are likely to grow with age. Although entrepreneurs are characterized by a lower perception of risks (Baron, 2004) per se, this feature might be emphasised for young entrepreneurs since they often are more prone to risky decisions. Sheehy (1976) suggests that young entrepreneurs are in the "trying twenties", a particular "stage" where all things seem possible and this is the time of opportunity. According to Favretto and Sartori (2007), risk taking may significantly differentiate young entrepreneur, who are capable to take more risks, mainly because of lower (job market) stigma failure. A study of Lorrain and Dussault (1988) found that the majority of young entrepreneurs did not perceive any risk in starting a new business since they had nothing to lose and could start a new career if they fail. At the same time, Gibb and Ritchie (1982) stated that people in early adult life perceived lower risk in starting a business. Moreover, scholars argue that young entrepreneurs have a lower sense of responsibility as well as lower obligations towards family and children (i.e. reduced family constraints) (Lorrain and Raymond, 1991; Stevenson, 1978). Previous studies found that commitment towards family is usually higher when people are more than 30 and 40 years old. Accordingly, the lower responsibility/commitment towards family and children and the lower risk perception may facilitate them to take the decision to travel and live across different countries.

The third issue to consider regards the ability for the entrepreneur to exploit opportunities. As stated by McMullen and Sheperd, (2006) "to be an entrepreneur is to act on a possibility that one has identified as an opportunity worth pursuing". In general, focus on opportunities decreases with age. Empirical research demonstrates that young adults have a stronger focus on opportunities than older adults (Cate and John, 2007; Zacher and Frese, 2009, 2011). On the other hand, to recognise an opportunity, a certain degree of domain-specific knowledge is required. In particular, work,

management and entrepreneurial experience have a great influence on opportunity discovery (Davidsson and Honig, 2003). Consistently with Lorrain and Raymond (1991) older entrepreneurs have significantly more work experience in their enterprise sector and also more business experience because they often are serial entrepreneurs. Other authors found out a negative correlation between early internationalization and learning from direct experience (Schwens and Kabst, 2009; 2011). In the context of BGCs, market-specific knowledge related to a particular country is crucial for entrepreneurs (Laanti et al., 2007; Oviatt and McDougall, 1995; Zhou, 2007). This knowledge tends to increase over time. Moreover, according to Zahra, Korri and Yu (2005) the entrepreneur's education and his/her expertise also shape his/her perceptions of the practicality/effectiveness of different strategic options being considered. Born globals' international strategies mainly reflect their entrepreneurs' expertise and previous experience on domestic and international markets. Other studies dealt with entrepreneurs' education background and startup performance. These studies, highlight how entrepreneurs' high educational levels/years of schooling (Bates, 1990; Roberts, 1991) is also related to superior startups' performance (Cooper and Gimeno-Gascon, 1992): in particular, Brinckmann, Salomo and Gemuenden (2009) show that startups, whose team members have strategic financial management competences, are often related to faster firms levels of growth and superior ability in fundraising (Talaia et al., 2013).

Finally one of the main drivers for the phenomenon of BGCs reported in literature is the access to business networks (Chetty and Campbell-Hunt, 2004; Laanti et al., 2007; Madsen and Servais, 1997; McDougall et al., 1994; Zain and Ng, 2006). The social capital, defined as the set of resources embedded in his/her social network, the access and the exploitation by the individual of such resources (Lin et al., 2001), is a strategic added value for all potential entrepreneurs. Literature distinguishes between bonding and bridging networks (Putman, 2000); bonding social capital refers to closed networks of family and friends; while bridging social capital refers to open networks that bridge different groups and communities. The latter is much more heterogeneous. For entrepreneurs and startups bonding social capital is more important since high level of trust is needed; bridging social networks is crucial to improve innovation and share knowledge (Woolcock and Narayan, 2000).

The access to bridging network is even more relevant for born BGCs (Presutti et al., 2007). Knowledge acquisition is often related to human/social capital and can be considered as a key factor for praecox internationalization of startups (Presutti et al., 2007). Building relationships with potential partners is a key factor for those type of companies: due to the lack of resources to control owned assets, the firm has to rely on hybrid or alternative governance structures, like licensing, franchising or co-sharing, to gain access to key complementary assets, as it was underlined by Oviatt and McDougall (1994) to be one of the necessary and sufficient elements for sustainable international new ventures. As stated by Chetty and Campbell-Hunt (2004) Born Globals differ from "traditional" internationalizing firms in the extent and pace of network development with business partners; while the latter tends to rely more on conventional distribution channels, such as agents and distributors (Bell et. al, 2003). Moreover, recent studies (Pettersen and Tobiassen, 2012) found that network changes greatly affected the growth and internationalization of BGCs.

Concluding, although the stream of research related to IE is rich in terms of conceptual/theoretical and empirical or case studies contributions, the current literature still lacks studies that explore how the born global phenomenon applies to young entrepreneurs.

CASE STUDY METHODOLOGY

In order to identify how the internationalisation path followed by the firm is affected by age-related drivers and provide further qualitative evidence to the literature background we presented above, we chose the multiple exploratory case-study method as a basis to build theories around the concept of the young entrepreneur (Corbin and Strauss, 1990; Eisenhardt, 1989; Yin, 1989; 1998; Maxwell, 1996; 1998). Moreover, we chose a multiple rather than a single case study approach in order to analyse pattern-matching properties between the cases analysed (Rialp et al., 2005). In order to assure the validity and reliability of the research, design and analytical requirements were followed (Yin, 1994). First, we defined a protocol according to the theoretical framework to be tested prior to the interviews phase; each company was interviewed following the same defined structure specifically built for the research. Then, as a requirement to ensure construct validity, we used multiple sources of evidence.

Research settings

We targeted high-tech companies that showed an international expansion since the first phases of their life cycles. For this reason, we identified the following six criteria in order to select the case studies: small size companies at the time of their first international operations (less than 20 employees); high-technology companies since as reported in literature

the BGC is widespread among high-tech industries; early internationalization, export activities or international offices within 3 years from the establishment; recent foundation (we included companies established after the year 2000). We selected companies founded in the same period in order to reduce the potential impact of overall market and technology trends. Moreover, since the geographic focus is on Italian startups, we chose companies founded by Italian entrepreneurs. Finally, since the focus of the paper is on young entrepreneurs we selected companies founded by entrepreneurs less than 35 years old at the time of the company establishment. We adopted as upper bound to define young entrepreneur the age of 35 years old, following the definition by the Global Entrepreneurship Monitor (Kelley et al., 2012). To make empirical results more comparable, we focused on companies that started their internationalisation process in the United States.

Data collection

Data collection involved two main sources: semi-structured interviews with entrepreneurs and multiple sources of secondary information, e.g. corporate documents, websites and press releases, which provide more accurate and unbiased information. Moreover several data about the industry and the market in which the firms operate were collected from articles, websites, books, and other sources of information. Relying on different sources of information allows data triangulation to ensure the validity of the study and to obtain a more comprehensive and accurate view of the topic analysed. To guarantee the reliability of the study a database with all the available documents, interviews transcripts and reviewed documentation was built. The interviews were recorded. All the interviewed companies are mentioned with their actual name and location. Although it is usually difficult to assure the external validity, meaning the possibility to obtain statistical generalisation inferring conclusions about a population through the case studies analysed, we choose to adopt a multiple case studies approach and we gathered details on the industry context, business model and financial data of the companies.

Documentary information

For each company selected for the study we collected documentary information through different sources. Information about services and product offered and the geographical reach were gathered through companies' websites; in addition, we asked the entrepreneurs company documentation to check financial information (capital raised, revenues etc.), moreover we collected from the entrepreneurs their companies' business plans in order to verify their business model and their strategy.

Individual interviews

We conducted open-ended and semi-structured interviews (from 60 up to 90 minutes as average) at the executive level (founder, CEO); we interviewed each company from 2 up to 4 times, according to the number of people we wanted to interview (i.e. multiple founders) and the extra information we wanted to gather, for a total number of 23 interviews. The defined protocol for the first interview investigated the previous experiences of the entrepreneur, the history, the business model, the internationalisation process and the future goals of the company. Detailed notes were taken and minutes of the interviews were sent back to the respondents a few days after the interview to verify with them the accuracy of the information. We adopted a logical sequence connecting the empirical evidence obtained from the different case studies to the theoretical framework chosen to compare our findings (pattern-matching approach). The eight cases are first briefly individually described and then cross-compared in order to explore the theoretical replication. The analytic approach then used allows the generalisation of the results from the cases used in our research to other similar contexts (Yin, 1989; 1998).

Data analysis

Upon completion of each interview, the voice recordings were transcribed into a text format, resulting in 150 pages of textual material. The textual material was coded by identifying four categories: quantitative information (to be checked with information gathered from external sources), emotions and feelings, experiences and activities, network and people. Grouping the information into these four categories allowed us to design a cross-cases analysis across the dimensions we wanted to analyse (financial needs, emotional attitude, previous experience and social capital.

CASE STUDY DESCRIPTION

Before presenting the case studies, we briefly describe some features of the selected companies, summarized in Table 1. All the considered firms are high-tech based. Most of them are web-based, sometimes including mobile services (Spreaker and Twimbow). The authors acknowledge that the choice of a very specific sub sector would limit the generalization of the analysis and that further research will be needed to test resulting theories on a larger industry spectrum. Coherently, the younger companies (1-2 years from establishment) present a lower number of employees, between 1 and 5, while the older (5-10 years) present a larger headcount (50 and over); most of them (5 out of 7) completed fundraising, either in Italy or in the United States.

Table 1: Classification of the case studies.

Startup	**Sub-sector**	**Revenue/month**	**Number of employees**	**Years of activity**	**Total external funding**
Fluidmesh	Software and hardware	$100K-1000K	10-20	5-10	$1M-5M (US VCs)
Funambol	Software	Undisclosed	>50	5-10	>$25M (US VCs)
Hyperfair	Web	$10K-100K	10-20	1-2	None (bootstrapping only)
Mashape	Web	$1-1K	1-5	1-2	$1M-5M (US VCs)
Neptuny	Software	Undisclosed	>50	5-10	$100k-1M (Italian VCs)
Risparmio Super	Web	$10K-100K	10-20	1-2	$100K-1M (Italian VCs)
Spreaker	Web	$1K-10K	5-10	1-2	$1M-5M (Italian VCs)
Twimbow	Web	Pre-revenue	1-5	1-2	None (bootstrapping only)

Case #1: Fluidmesh Networks develops a set of wireless transmitters for many different applications in the security field, from video surveillance to data transfer. The company was founded in 2005 in Boston by a team of Italian engineers graduated at the Massachusetts Institute of Technology, USA and the Polytechnic University of Milan, Italy. At the time of the foundation the CEO was 26 years old. The R&D activities are performed by the Italian subsidiary in Milan which acts also as the main European headquarter of the company. The marketing and sales team is, indeed, dislocated among the firm's main markets (Europe, USA and Latin America) to assure the proximity to the customers.

Case #2: Funambol produces white-label software (OneMediaHub), which is a cloud digital locker that wirelessly syncs rich media (pictures, video and music), files and PIM data across smartphones, tablets, PCs. Funambol was founded in Pavia, Italy in 2002 from a serial entrepreneur, Fabrizio Capobianco, a Computer Science Ph.D. graduated at University of Pavia when he was 32. The company's headquarter was moved to San Francisco in 2004, after two years from its inception. In order to leverage on the greater potential for equity capital in the US market, Capobianco founded Funambol Inc. and transferred to the new company the Italian company's ownership (Presutti et al., 2008). This decision helped the company to go through different rounds of funding for over $25 Million. The R&D activities are still located in Pavia.

Case #3: Hyperfair has a proprietary technology to organize virtual events and virtual business environments such as trade shows, congresses. Hyperfair was founded in 2009 in Lecco, Italy, when the person in charge of the business development in the US was 29. The company has planned to address the global scale since the beginning and the United States are considered as the key market due to the huge presence of tradeshows and corporate events. Therefore, in 2010, they moved the headquarter to San Francisco to found Hyperfair Inc., while leaving a subsidiary in Italy to exploit the good quality-price ratio and high graphics skills of software developers and the established partnership with

Polytechnic University of Milan. The marketing and sales team is based in San Francisco, because of the proximity with potential partners and the greater opportunity of fund raising.

Case #4: Mashape built the first online marketplace for APIs (Application Programming Interface), where software developers and companies can distribute and buy access to services they create. Mashape was founded in July 2009 in San Francisco, USA by two Computer Science Engineers (20 and 27 years old) and one Economics graduated from Rome (20 years old). The US market was considered the target market from the beginning, although the product is offered on a global scale. The team decided to move to US since the beginning because they were not able to find capital in Italy, also for their very young age; in US they raised over 1 million USD from business angels.

Case #5: Neptuny is a leading provider of IT Performance Optimization and Capacity Management solutions for IT data centres and networks. The company was founded in 2002 in Milan by three researchers graduated at Polytechnic University of Milan, 30 years old. Although the firm entered the US market since 2005, Neptuny established a subsidiary company in the United States in 2008; the main reason was to facilitate the relationships with local customers. Before being acquired by BMC software, the Italian office was Neptuny's headquarter; moreover, to enhance the firm's presence on the European market, another subsidiary has been opened in London.

Case #6: Risparmio Super offers a service of online prices comparison among large retailers' chains for groceries goods and consumer electronics. The company was founded in 2010 by Barbara Labate when she was 34. Barbara is Master's graduated at Columbia University of New York in Business. Moreover, in 2011 she attended a training program for startups in Silicon Valley. The firm's headquarter is in Milan, Italy although some developers are located in Messina, Sicily, to leverage on the lower cost of salaries. In 2011, Barbara Labate moved to Silicon Valley to understand the US market and customize the product for the American customers' needs. The corporate plan is to launch the service in the US in 2012.

Case #7: Spreaker offers an online application for creating and sharing live audio content on the Internet. The company was founded in November 2009 in Bologna by Francesco Baschieri when he was 34 years old. After three months acceleration program in San Francisco, a sister company, Spreaker Inc., was founded in the US, with an exclusive license agreement with the Italian firm. The US market is considered strategic for increasing the service adoption both for its size and homogeneity. The presence in the US is also crucial to enhance the awareness of the product by potential buyers for future acquisition. All the development activities are located in Italy; the founders believe in the high quality of Italian developers and the company's main suppliers are based in the same area, so the interaction between suppliers and Spreaker's employees is easier, due to proximity and common culture. Moreover the management team is based in Italy too, so the closeness to developers can assure an on-time facing of users' problems and needs. The marketing and sales teams are mostly located in the US (recently in Latin America too), to increase the ability of the company to address the local needs.

Case #8: Twimbow is a web application for Twitter users. It is an innovative web-based customizable dashboard that allows the user to categorize and monitor keywords, users, Twitter lists, tags through a colourful interface; each colour corresponds to different categories. Twimbow is a San Francisco-based corporation founded in May 2011 by Luca Filigheddu, an Italian software engineer, when he was 34 years old. The company has developed a completely functional product which currently has a low number of users (10,000); hence Twimbow is focusing today on the development of additional services and viral marketing to increase its user base. Today the CEO and CFO are mainly based in US for managing the business development and fund raising activity; one developer is based in Italy.

CROSS CASE ANALYSIS AND FINDINGS DISCUSSION

In this section, we will describe results obtained from the case study analysis and we will present propositions interrelated to the "status" of being young entrepreneurs and each driver, developed through the cross case analysis.

Availability of financial resources.

The amount of financial resources entrepreneurs can rely on or access to, is a crucial aspect to startup a company/business. As previously mentioned, young entrepreneurs face greater difficulties in fund raising (especially from institutional investors) compared to their elder peers (Atieno, 2009; Ierapetritis et al, 2010; Shoof, 2006). This aspect is relevant to our analysis since the difficulties young entrepreneurs encounter in fund raising may incentivise them, on the one hand, to locate the headquarter of the new company in countries where there is a larger and more dynamic capital market or where young entrepreneurs are not perceived less reliable than old or serial entrepreneurs only for age reasons; on the other hand, this context can incentivise them to anticipate the decision to move abroad. These considerations find strong empirical support from our analysis: many of the case studies analysed confirm that one of the main reasons to early internationalise in the US is the larger availability of venture capital.

The Mashape team decided to move to Silicon Valley since the inception because they were not able to find capital in Italy, also because they lacked credibility due to very young age; in US they raised more than 1 million USD from business angels. As stated by one of the co-founders, "In US, people don't care about age, one of our angels told me this is something which belongs to the European culture, and here if you are good you are good despite your age". The CEO of Funambol decided to move its headquarter to San Francisco in order to leverage on the greater potential for equity capital in the US market; this decision helped the company to raise over $25 Million. Fabrizio Capobianco quotes "In my prior company many potential customers in Italy, though they liked our product, refused to buy it because I was too young". Twimbow's CEO and CFO moved to Silicon Valley for the fund raising activity. Moreover, it seems that, since the young entrepreneurs are aware that if the young age may decrease their own credibility, they need to balance with their determination and their talent; as stated by the Fluidmesh CEO "Talking with a VC when you are young is difficult because you lack of experience and credibility. However we communicated them that we truly believed in our project and that we were able to execute it out". On the investors' side, it seems that providers not being subject to the strict rules banks are subject to, tend to bet more on the project and team even if there are no financial sources to secure the investment. Finally many of the companies analysed decided to keep R&D departments in Italy to leverage on the high quality/low price of salaries of Italian engineers and developers; 3 out 4 cases decided to maintain the R&D department in Italy to exploit the good quality-price ratio and high quality skills of software developers. Thus, we formulate the first proposition:

Proposition 1: Being young entrepreneurs usually more financially constrained than old entrepreneurs, they tend to internationalize towards those countries where financial resources are more available and accessible.

Lower risk perception and lower commitment towards family.

As stated in the literature review, risk aversion as well as the adoption of responsible behaviours are likely to grow with age (Gibb and Ritchie, 1982; Timmons and Spinelli, 2010). According to Stevenson (1978) and Lorrain and Raymond (1991), young entrepreneurs have lower obligations toward family and children and higher risk attitude. Therefore, young entrepreneurs (i.e. less than 35 years old) have typically lower family constraints. As a consequence, they can spend extended period abroad more easily and decide where to relocate according to business-related decisions. According to the case studies, the lack of family constraints seems to influence the choice of early internationalisation (5 out of 8 cases). As stated by the CEO of Risparmio Super "Without family, children and/or old parents you can travel without thoughts; on the contrary having family roots limits your mobility and a real international vision". Thus, we formulate the following proposition:

Proposition 2: Being young entrepreneurs characterized by a lower perception of risk and lower family constraints, they tend to be more incentivized to set-up a BGC than old entrepreneurs.

Entrepreneurs' prior international experience.

Oviatt and McDougall (2005) explained that market knowledge as well as the knowledge of the product and/or service increase the speed at which perceived opportunity is exploited internationally. Entrepreneur's previous experience in international markets, her/his living abroad as well as having prior working experience are considered as key factors in

accelerating the internationalization process and/or in increasing the company commitment towards the internationalization process (Almeida and Bloodgood, 1996; Bloodgood et al., 1996; Reuber and Fischer, 1997; Shrader et al., 2000). Moreover, many studies highlight a positive relationship between the growth of firms within foreign markets and the entrepreneurs' international experience acquired travelling and/or studying abroad, high level of education and knowledge of foreign languages (Ditch et al., 1984; Ibeh, 2003; Zahra et al., 2005; Zucchella et al., 2007). Fluidmesh founders' previous period of study experience at MIT in Boston allowed them to accrue technological competences as well as knowledge of the US market and create a business network in the IT business. The knowledge of the market for a specific country seems to be relevant as well. Spreaker's founder, after spending a three months incubation period in San Francisco, funded a sister company in the US. Risparmio Super's founder gained knowledge of the US market during her studies at Columbia University in New York and during a training period in Silicon Valley; her previous working experience within internet and mobile marketing industry helped her and the company to develop a product better targeting customers' needs. Finally, Fabrizio Capobianco had a previous experience as Ph.D. student and manager in Silicon Valley that helped him to gather an in-depth knowledge of the US market and context dynamics. Despite their young age, it seems that also short previous experiences abroad helped the entrepreneurs to internationalize their companies. Hence we posit:

Proposition 3: Having young entrepreneurs no (or limited) previous market-specific knowledge compared to old entrepreneurs, they tend to overcome this drawback by leveraging the international experience they accrued during their studies abroad.

Access to business networks.

The access to bridging network is even more relevant for BGCs than for traditional companies. McDougall et al. (1994) explained that networks helped founders of international new ventures in recognizing international business opportunities. Oviatt and McDougall (1995; 2005) identified strong international business networks as one of the seven most important characteristics of successful global startups. This aspect has been stressed/highlighted also by more recent studies (Chetty and Campbell-Hunt, 2004; Pettersen and Tobiassen, 2012; Presutti et al., 2007). The eight case studies analysed present a homogeneous position on this dimension. Indeed all the entrepreneurs interviewed state that their business network helped them in starting up their business and expanding internationally. According to Twimbow's CEO, the professional network, developed during his prior career, allowed him to start up a strong business relationship with hosting service providers as well as launch an effective marketing campaign and good press coverage. His professional network, developed in previous working experiences, has been crucial for the Spreaker's CEO to raise the two rounds of funding the company has insofar completed. The same networks and particularly the in-depth relationship with the University of Bologna helped the company in recruiting. Mashape leveraged the relationship with some angels and mentors, who supported the company in its growth on the US market and the seed funding. The professional network helped the founders of Hyperfair to find the main suppliers, among them the Polytechnic University of Milan. The CEO had already experience in the web industry due to his prior activity as entrepreneur, in particular with a web-based company of real time video streaming. The period of incubation spent in Silicon Valley helped him to develop a professional network on the US market. Two of the founders of Fluidmesh state that the network developed during the years of study at MIT helped them to more easily reach out customers and partners and exploit business opportunities in the US market. On the other hand, the connections and interactions of the other two founders with the Polytechnic University of Milan were important to hire the most talented engineers in Italy. The serial entrepreneurship experience of Fabrizio Capobianco, founder of Funambol, was the key factor for the success of the company: leveraging his network he built during his prior Ph.D. period and working experience in Silicon Valley, Capobianco got in touch with several venture capital firms operating in the US market and managed to get his company funded. His professional connections were also valuable to reach big customers and partners as well for recruiting was facilitated by the relationships he developed during his prior working experiences. The professional networks of the founders of Neptuny, both in the hiring process of valuable people and in reaching out customers and partners all over the world, brought to the company advantages. The collaboration with Gartner was crucial for the company's success because it helped Neptuny to reach the main clients and partners. One of the founders of Risparmio Super attended an MBA at Columbia University in New York. More recently, she also participated in a training program for startups in Silicon Valley. The business idea of Risparmio Super originated during the master program there. Moreover, one of the company's mentors is a professor at the Columbia University who helped the CEO in finalizing the project.

Similar to the previous knowledge, although according to the literature review the social capital is accumulated along the years it seems that, given the necessity to rely on a relevant network, young entrepreneur tend to invest heavily in this aspect to compensate the young age effect. Thus, we formulate the following proposition:

Proposition 4: Being young entrepreneurs less socially networked than old entrepreneurs, they tend to invest heavily and quickly in their social capital in order to establish a BGC.

CONCLUSIONS

In this paper we contributed to entrepreneurship literature and, particularly, to the streams of international and young entrepreneurship literature by exploring the born global phenomenon under the young entrepreneurship lenses. We applied an exploratory multiple case studies approach based on a sample of eight BGCs founded by Italian entrepreneurs to identify the factors that facilitate or hinder young entrepreneurs to establish a BGC. Results are described in table 2.

The lack of financial resources for young entrepreneur seems to be a triggering factor for starting a born global company since the paucity of financial resources spurs young entrepreneurs to move to those countries where there is a larger availability of equity capital for startups (specifically United States and in particular the Silicon Valley). Indeed results confirm that young entrepreneurs lack of credibility from financial actors since they do not have a track record as entrepreneurs (Stevenson, 1987). However they seem to be aware they need to compensate credibility by showing investors they believe in the company and they have the ability to execute the project.

Moreover, the lower risk perception and the lower commitment towards family and children seem to facilitate the ability to start born global companies, by allowing young entrepreneurs to be more prone to mobility.

The access to different business networks and the previous knowledge and experience of the founders seem to be the real enablers of born global companies. All the entrepreneurs we interviewed stressed the relevance of leveraging a wide and qualified business network and the prior experience they accrued, both as entrepreneurs, students and workers. Periods of study/training (Fludimesh, Funambol, Hyperfair, Spreaker, and Risparmio Super) and working abroad (Funambol, Twimbow) is frequently mentioned. The previous knowledge and experience of the founders in the same business segments is not confirmed as equally important. This factor is mentioned by some firms (Twimbow, Hyperfair, Fluidmesh), but they refer mostly to a generic experience in the industry and not to a specific knowledge of the business. We can therefore conclude that a prior experience abroad (not necessarily as entrepreneur in the same business/segment) seems to trigger a venture with a stronger and earlier internationalisation. Moreover, we find a strong correlation between the place where the prior experience has been done and the areas of internationalization of the BGC (Fluidmesh, Funambol, Hyperfair, Risparmio Super, Spreaker, and Twimbow). An important finding, for the perspective of the young entrepreneurship is that, although young, entrepreneurs seem to be willing to heavily invest and capitalise on building their own network; this result may be explained by the urgency and the relevance to access to external resources through business networks since they lack of internal assets (Laanti et al., 2007; McDougall et al., 1994; Zain and Ng, 2006).

Concluding, the multiple case analysis highlights how the limited financial resources seem to be a triggering factor for young entrepreneurs to adopt a born global approach. Hence, an implication for young entrepreneur is to compensate credibility by showing strong commitment towards her/his new enterprise. Moreover this result suggests that the paucity of owned assets spurs young entrepreneurs to access to resources in those places/countries where there are bigger venture capital markets.

Moreover, results highlight the importance of professional networks built by entrepreneurs before establishing the company. Consistently to previous studies (McDougall et al. 1994; Presutti et al., 2007), our study points out how networks helped founders of born global companies to recognise and exploit international business opportunities. Most importantly we found that, although social capital increases with age, given the relevance of this factor to start a BGC, young entrepreneurs seem to invest heavily into widen their social network and countervail the young age effect. Finally, we found that entrepreneur's prior experience abroad (either as entrepreneur or as employee or as student/PhD student) triggers and shapes the internationalization process of a company.

Some limitations of this study must be remarked. First, the small number of companies analysed and the Italian nationality of entrepreneurs do not allow broad generalization of results. Therefore, further empirical studies on a larger sample including BGCs from different countries are required. The same holds for industry specificity effects, indeed our study is based on web and digital firms; further research is needed to explore the phenomenon in other industries

both high tech (i.e. healthcare, biotech, nanotech) and low tech. Finally, to better understand the connection between young entrepreneurs and their ability to start a born global company further research is required. Based on the suggestions arising from the present study, a significant extension of the studies related to young entrepreneurs will be recommended. The role of (non) enterprising parents and of non-parental role models, motivational drivers concerning young entrepreneurs and their decision to startup and the impact of national cultures on the perceived credibility of young entrepreneurs could represent some first steps to expand this research stream. In fact, as suggested by Dhose and Walter (2012), further analyses on the entrepreneurs' contextual framework would provide important implications for theory building in the field of young entrepreneurship but also for policy makers. This further analysis could highlight the emerging intersection among the research fields on young and international entrepreneurship and Born Globals, with the goal to identify which drivers encourage young people to opt for an international entrepreneurial career.

Table 2: Summary of cross case analysis' results and emerging propositions

Driver	Description	Fluidmesh	Funambol	Hyperfair	Mashape	Neptuny	Risparmio Super	Spreaker	Twimbow	Empirical results	Proposition
Access to financial resources	Lack of accumulated own financial assets. Lack of perceived credibility of young people from banks, VC, etc.	The R&D activities are performed by the Italian subsidiary in Milan to leverage on the high quality researchers at Polytechnic University of Milan.	The CEO moved its headquarter to San Francisco to leverage on the greater venture capital market in Silicon Valley. The R&D activities are still located in Pavia, Italy.	They kept a subsidiary in Italy to exploit the good quality-price ratio of software developers and the established partnership with Polytechnic University of Milan.	The decision to move to Silicon Valley was based on the difficulty to fundraising in Italy amplified by their young age; in US they raised 1 million USD from business angels.	The firm entered the US market in 2005, it established a subsidiary in the United States in 2008 to better serve local customers.	The firm's headquarter is in Milan, Italy. Some developers are located in Messina, Sicily, to leverage on the lower labour cost.	All the development activities are located in Italy; the founders believe in the higher quality of Italian developers.	Twimbow's CEO and CFO moved to Silicon Valley for fund raising.	Mashape, Funambol and Twimbow affirm they moved to US specifically to raise capital, also because of their lack of credibility as young entrepreneurs.	Being young entrepreneurs usually more financially constrained than old entrepreneurs, they tend to internationalize towards those countries where financial resources are more available and accessible
Lower risk perception and lower commitment towards family	No family constrains: easier to spend periods abroad, to decide where to settle according to business-related choice.	Agree, but education impacted too.	Disagree.	Agree, less family constrains facilitate international mobility (although lower economic possibilities).	The factor is not that relevant, but the lack of family constrains helped too.	There are other factors influencing the choice, but the lack of family constrains contributed to it.	The lack of family constrains is very influential; with a family it's difficult to have an international perspective.	Disagree.	The factor is not that relevant.	The lack of family constrains seems to facilitate the decision of early internationalization (5 out of 8).	Being young entrepreneurs characterized by a lower perception of risks and lower family constraints, they tend to be more incentivized to set-up a BGC than old entrepreneurs.
Entrepreneurs previous international experience	Education; Living and working abroad; Knowledge of foreign markets;	High technology education at MIT. Knowledge of the US market.	Founder is a serial entrepreneur with previous working experience	The CEO is a web-based serial entrepreneur. He spent a training period in	High-tech and business background of the founders. First entrepreneurial experience.	Product developed by the founders as part of their academic	Knowledge of the US market acquired during a period of study at Columbia University.	Previous experience of the founders in totally different markets. The CEO spent a	CEO's previous working experience in the same market segment and	Previous knowledge and experience in the same market can be helpful to speed up the expansion of the	Having young entrepreneurs no (or limited) previous market-specific knowledge compared to old

	Knowledge of business.	Founder's previous experience in IT business.	abroad in the same market.	Silicon Valley.		research activity. Strong IT skills and education.	The CEO spent a training period in in Silicon Valley. Previous working experience in same industry.	period of training and pre-incubation in Silicon Valley.	in the US.	company. However it is not confirmed in all cases. Conversely prior experience abroad (also periods for studying/training) seems to trigger the early internationalization of the firm.	entrepreneurs, they tend to overcome this drawback by leveraging the international experience they accrued during their studies abroad.
Access to business networks	Access to business networks in the home country and on foreign markets.	MIT's networks used to reach customers and partners.	Previous professional networks helped to enter in contact with industries.	Period of incubation in USA allowed establishing business network abroad.	Business introductions by angels and mentors.	Gartner's network helped to reach customers and partners.	Networks developed in the previous working experiences helped the company to develop partnerships.	Professional networks allow reaching *superangels*.	Previous professional networks helped in finding suppliers and public relations.	The access to business networks allows startups to create key alliances and reach investors. The ability to leverage on it is the real enabler of the earlier internationalization of the company.	Being young entrepreneurs less socially networked than old entrepreneurs, they tend to invest heavily and quickly in their social capital in order to establish a BGC.

REFERENCES

Almeida, J. and Bloodgood, J. (1996) 'Internationalization of new ventures: Implications of the value chain', in Reynolds, P.D. et al. (Eds.), *Frontiers of entrepreneurship research*, pp. 211-225.

Atieno, R. (2009) 'Linkages, access to finance and the performance of small-scale enterprises in Kenya', *Journal of Accounting and Business Research*, Vol. 3, No. 1, pp. 33-48.

Autio, E., Sapienza, H. and Almeida, J. (2000) 'Effects of age at entry, knowledge intensity, and imitability on international growth', *Academy of Management Journal*, Vol. 43, pp. 909-924.

Baron, R.A. (2004) 'The cognitive perspective: A valuable tool for analysing entrepreneurship's basic «Why» Questions', *Journal of Business Venturing*, Vol. 19, No. 2, pp. 221-239.

Bates, T. (1990) 'Entrepreneur human capital inputs and small business longevit', *Review of Economics and Statistics*, Vol. 72, pp. 551-559.

Bloodgood, J., Sapienza, H. and Almeida, J. (1996) 'The internationalization of new high-potential U.S. ventures: Antecedents and outcomes', *Entrepreneurship: Theory and Practice*, Vol. 20, pp.61-76.

Brinckmann, J., Salomo, S. and Gemuenden, H.G (2009) 'Financial Management Competence of Founding Teams and Growth of New Technology-Based Firms', *Entrepreneurship Theory and Practice*, Vol. 35, No. 2, pp. 217-243.

Cassia, L., Criaco, G. and Minola, T. (2012) 'Overcoming barriers in the entrepreneurial process of youth: the importance of support programs', in Muffatto M. and P. Giacon, *Entrepreneurial Strategies and Policies for Economic Growth*, Conference Proceedings of the International Symposium on Entrepreneurship and Innovation – ISEI, Venice 24-25 May 2012, Libreria Universitaria Edizioni, pp. 647-664.

Cannone, G. and Ughetto, E. (2013) 'Born globals: A cross-country survey on high-tech start-ups', *International Business Review*, forthcoming.

Cate, R.A. and John, O.P. (2007) 'Testing models of the structure and development of future time perspective: maintaining a focus on opportunities in middle age', *Psychology and Aging*, Vol. 22, No. 1, pp. 186–201.

Chandler, A. D. Jr (1986) 'The evolution of modern global competition', in M. E. Porter (Eds.), *Competition in global industries*, Boston: Harvard Business School Press, pp.405-48.

Chetty, S. and Campbell-Hunt, C. (2004) 'A strategic approach to internationalization: a traditional versus a "born global" approach', *Journal of International Marketing*, Vol. 12, No.1, pp.57–81.

Chigunta, F. (2002) *Youth Entrepreneurship: Meeting the Key Policy Challenges*, Wolfson College, Oxford University, England.

Chlosta, S., Patzelt, H., Klein, S.B., and Dormann, C. (2012) 'Parental role models and the decision to become self-employed: The moderating effect of personality', *Small Business Economics*, Vol. 38, pp. 121-138.

Cooper, A.C. and Gimeno-Gascon, F.J. (1992) 'Entrepreneurs, processes of founding and new firm performance', in: D. Sexton and J. Kasarda (eds.), *The State of the Art in Entrepreneurship*, Boston, MA: PWS Publishing Co.

Corbin J. and Strauss A. (1990) ' Grounded theory research: procedures, canons and evaluative criteria, *Zeitschrift für Soziologie*, Vol. 19, No. 6, pp. 418-427.

Davidsson, P. and Honig, B. (2003) 'The role of social and human capital among nascent entrepreneurs', *Journal of Business Venturing*, Vol. 18, No.3, pp.301-331.

Ditch, E., Kondo, F., Koglmayr, H. G., and Muller, S. (1984) 'The foreign orientation of managers: A key variable-export promotion and export results', *The Ritsumeikan Business Review*, Vol. 23, No. 2, pp. 1–33.

Dohse, D. and Walter, S.G. (2012) 'Knowledge context and entrepreneurial intentions among students', *Small Business Economics*, Vol. 39, pp. 877-895

Eisenhardt, K. (1989) 'Building theories from case study research', *Academy of Management Review*, Vol. 14, No.4, pp.532-550.

Evangelista, F. (2005) 'Qualitative insights into the international new venture creation process', *Journal of International Entrepreneurship*, Vol. 3, No.3, pp.179-198.

Favretto, G. and Sartori, R. (2007) 'L'età dell'impresa. Giovani imprenditori e lavoratori esperti', Franco Angeli, Milano.

Freear, J., Sohl, J. E. and Wetzel, W. E., Jr. (1995a) 'Early Stage Software Ventures: What Is Working and What Is Not'. Report for the Massachusetts Software Council.

Freear, J., Sohl, J. E. and Wetzel, W. E., Jr. (1995b) 'Who Bankrolls Software Entrepreneurs', in W. D. Bygrave, B. J. Bird, S. Birley, N. C. Churchill, M. Hay, R. H. Keeley and W. E. Wetzel jr. (eds.), *Frontiers of Entrepreneurship Research*, Babson Park, MA: Babson College, pp. 394-406.

Freeman, S. and Cavusgil, S. T. (2007) 'Toward a typology of commitment states among managers of born-global' *Journal of International Marketing*, Vol. 15, No.4, pp.1-40.

Frosch, K. H. (2011) 'Workforce age and innovation: a literature survey', *Human Resource Management International Digest*, Vol. 20, No. 3, pp. 414-431.

Gabrielsson, M., Kirpalani, V.H.M., Dimitratos, P., Solberg, C.A., Zucchella, A. (2008) 'Born globals: Propositions to help advance the theory', *International Business Review*, Vol. 17, pp. 385–401.

Giacon, P., and Muffatto, M. (2012) 'Moving the lens towards young entrepreneurs: Specificities, research questions and future directions', in Muffatto M. and P. Giacon, *Entrepreneurial Strategies and Policies for Economic Growth*, Conference Proceedings of the International Symposium on Entrepreneurship and Innovation – ISEI, Venice 24-25 May 2012, Libreria Universitaria Edizioni, pp. 685-702.

Gibb, A. A. and Ritchie, J. (1982) 'Understanding the process of starting small businesses', *European Small Business Journal*, Vol. 1, No. 1, pp.26-46.

Gielnik, M.M., Zacher H. and Frese M (2012) 'Focus on opportunities as a mediator of the relationship between business owners' age and venture growth', *Journal of Business Venturing*, Vol. 27, pp. 127–142.

Ibeh, K. (2003) 'Toward a contingency framework of export entrepreneurship: conceptualisations and empirical evidence', *Small Business Economics*, Vol. 20, No.1, pp.124-141.

Ibeh, K. I. N., and Young, S. (2001) 'Exporting as an entrepreneurial act: An empirical study of Nigerian firms', *European Journal of Marketing*, Vo. 35, No. 5–6, pp. 566–586.

Ierapetritis, D.G., Lagos, D. and Balomenou, K.C. (2010) 'Outlining the determinants of youth entrepreneurship in the Greek periphery', *International Journal of Entrepreneurship and Small Business*, Vol. 11, No. 2, pp. 205-217.

Johanson, J. and Vahlne, J. (1977) 'The internationalization of the firm. A model of knowledge development and increasign foreign market commitments', *Journal of Internationalization Business Studies*, Vol.8, No.1, pp.23-32.

Jolly, V. K., Alahuhta, M. and Jeannet, J. P. (1992) 'Challenging the incumbents: how high tech technology', *Journal of Strategic Change*, Vol. 1, pp. 71-82.

Katz, J. A., Safranski, S. R. and Khan, O. (2003) 'Virtual instant global entrepreneurship, *Journal of International Entrepreneurship*, Vol.1, No.1, pp.43-57.

Kelley, D.J., Singer, S., Herrington, M. (2012) 'The Global Entrepreneurship Monitor - Global Report', www.gemconsortium.org

Knight, G. A. and Cavusgil, S. T. (1996) 'The Born Global Firm: A Challenge to Traditional Internationalization Theory', *Advances in International Marketing*, Vol. 8, pp. 11-26.

Kuemmerle, W. (2002) 'Home base and knowledge management in international ventures', *Journal of Business Venturing*, Vol. 17, pp. 99–122.

Laanti, R., Gabrielsson, M. and Gabrielsson, P. (2007) 'The Gobalization Strategies of Business-to-Business Technology Industry', *Industrial Marketing Management*, Vol. 36, pp. 1104-1117.

Lewis, K.V., and Massey, C.L. (2003) 'Youth entrepreneurship', in AD. Bruin, and AD. Eds (Eds.) *Entrepreneurship: New Perspectives in a Global Age*. (pp. 206 - 226). Hampshire, UK: Ashgate

Liesch, P., and Knight, G. (1999) 'Information internalization and hurdle rates in small and medium enterprise internationalisation', *Journal of International Business Studies*, Vol. 30, No. 1, pp. 383–394.

Lin, D. N., Cook, K. S., Burt, R. S. (2001), *Social Capital Theory and Research*, Transaction Publishers, New Brunswick, New Jersey.

Lorrain, J. and Dussault, L. (1988) 'Relation between psychological characteristics, administrative behaviors, and success of founder entrepreneurs at the start up stage', in B. A. Kirchhoff, W.A. Long, W. ED., McMullan, K.H. Vesper and W.E. Wetzel, *Frontiers of Entrepreneurship Research*, Wellesley, Mass.: Babson College (Eds.), pp. 150-164.

Lorrain, J., Raymond, L. (1991) 'Young and Older Entrepreneurs: An Emprical Study of Difference', *Journal of Small Business and Entrepreneurship*, Vol. 8, No.4, pp.51-61.

Madsen, T. K. and Servais, P. (1997) 'The internationalization of born globals: an evolutionary process?', *International Business Review*, Vol. 6, No.6, pp. 561-583.

Maxwell, J. A. (1996) *Qualitative Research Design: An Interactive Approach*, Thousand Oaks: Sage Publications.

Maxwell, J. A. (1998) 'Designing a Qualitative Study', in L. Bickman and D. J. Rog (Eds.), *Handbook of Applied Social Research Methods*. Thousand Oaks, Sage Publications, pp. 69-100.

McDougall, P. P. (1994) 'Explaining the formation of international new ventures: the limits of theories from international business research', *Journal of Business Venturing*, Vol. 9, No.6, pp.469-487.

McDougall, P. P., Shane, S. and Oviatt, B. M. (1994) 'Explaining theformation of international new ventures', *Journal of Business Venturing*, Vol. 9, No. 6, pp. 469–487.

McDougall, P. P., Oviatt, B.M. and Shrader, R.C. (2003) 'A Comparison of International and Domestic New Ventures', *Journal of International Entrepreneurship*, Vol. 82, No. 1, pp. 1570-7385.

J. S. McMullen and D. A. Shepherd (2006) 'Entrepreneurial Action and the Role of Uncertainty in the Theory of the Entrepreneur', *The Academy of Management Review*, Vol. 31, No. 1, pp. 132–52.

Onetti, A, Talaia M, Odorici V., Presutti M. and Verma S. (2010) 'The role of serial entrepreneurs in the internationalization of global start-ups. A business case', *Journal of Strategic Management Education*, Vol. 6, No. 1, pp. 79-94.

Oviatt, B. M. and McDougall, P. P. (1994) 'Toward a theory of international new ventures' *Journal of International Business Studies*, Vol. 25, No.1, pp.45-64.

Oviatt, B. M. and McDougall, P. P. (1995) 'Global start-ups: entrepreneurs on a worldwide stage', *The Academy of Management Executive*, Vol. 9, No. 2, pp.30-44.

Oviatt, B. M. and McDougall, P. P. (2000) 'International Entrepreneurship: the intersection of two reserach paths', *Academy of Management Journal*, Vol. 43, No. 5, pp. 902-906.

Oviatt, B. M. and McDougall, P. P. (2005) 'Defining International Entrepreneurship and modelind the speed of internationalization', *Entrepreneurship theory and practice*, pp.537-553.

Pettersen, I.B. and Tobiassen, A.E. (2012) 'Are born globals really born globals? The case of academic spin-offs with long development periods', *Journal of International Entrepreneurship*, Vol. 10, No. 2, pp. 117-141.

Preece, S. B., Miles, G. and Baetz, M. C. (1998) 'Explaining the international intensity and global diversity of early stage technology based firms', *Journal of Business Venturing*, Vol. 14, pp.259-281.

Presutti, M., Boari, C. and Fratocchi, L. (2007) 'Knowledge Acquisition and the Foreign Development of High-tech Start-ups: a Social Capital Approach', *International Business Review*, Vol. 16, No. 1, pp. 23-46.

Presutti, M., Onetti, A. and Odorici, V. (2008) 'Serial entrepreneurship and born global new ventures. A case study', *International Journal of Entrepreneurship Education*, Vol. 6, pp. 255-278.

Putnam, R. D. (2000) *Bowling Alone*, New York: Simon and Schuster

Rasmussen, E. S. and Madsen, T. K. (2002) 'The born global concept', Paper presented at the 28th EIBA Conference. http://www.sam.sdu.dk/~era/EIBA%20Rasmussen%202002%20.pdf, retrieved on October 30th, 2011.

Reuber, A. and Fischer, E. (1997) 'The influence of the management team's international experience on the internationalization behavior of SMEs', *Journal of International Business Studies*, Vol. 28, No. 4, pp. 807-825.

Rialp, A., Rialp, J. and Knight, G. A. (2005) 'The phenomenon of early internationalizing firms: what do we know after a decade (1993-2003) of scientific inquiry?', *International Business Review*, Vol. 14, pp. 147-166.

Roberts, E.B. (1991) *Entrepreneurs in High Technology: Lessons from MIT and Beyond*, New York: Oxford University Press.

Servais, P. and Rasmussen, E. S. (2000) 'Different Types of International New Ventures: 1-27'. Paper presented at the annual meeting of the Academy of International Business, Phoenix.

Sheehy, G. (1976), Passages: *Predictable Crisis of Adult Life*, New York: Dutton.

Schoof, U. (2006) 'Stimulating Youth Entrepreneurship: Barriers and Incentives to Enterprise Start-Ups by Young People', SEED Working Paper International Labour Office, 76.

Schwens C. and Kabst R. (2009) 'How early opposed to late internationalizers learn: Experience of others and paradigms of interpretation', *International Business Review*, Vol 18, No. 5, pp. 509-522

Schwens C. and Kabst R. (2011) 'Internationalization of young technology firms: a complementary perspective on antecedents of foreign market familiarity', *International Business Review*, Vol. 20, No. 1, pp. 60-74.

Shrader, R., Oviatt, B. M. and McDougall, P. P. (2000) 'How new ventures exploit trade-offs among international risk factors: Lessons for the accelerated internationalization of the 21st century', *Academy of Management Journal*, Vol. 43, pp. 1227-1248.

Stevenson, L., (1987) 'Toward understanding young founders', in N.C. Churchill, J.A. Hornaday, B.A. Kirchhoff, O.J. Krasner and K.H. Vesper (Eds.), *Frontiers of Entrepreneurship Research*, Babson College.

Talaia M., Pisoni A. and Onetti A. (2013) 'Factors influencing fund raising: an empirical study on italian startups, Conference Proceeding of the 6th Annual EMAB Conference, ISBN: 978-9963-711-16-1.

Timmons, J.A. and Spinelli, S.J. (2010) *New venture creation, Entrepreneurship for the 21st Century*, McGraw Hill International Edition.

Vernon, R. (1966) 'International Investment and International Trade in the Product Cycle', *Quarterly Journal of Economics*, Vol. 80, No. 2, pp.190-207.

Yin, R. K. (1989) *Case Study Research: Design and Methods*, Beverly Hills, CA: Sage Publications.

Yin, R. K. (1994) *Case Study Research: Design and Methods*, London, UK: Sage.

Yin, R. K. (1998) 'The Abridged Version of Case Study Research', in L. Bickman and D.J. Rog, (Eds.), *Handbook of Applied Social Research Methods.* Thousand Oaks: Sage Publications, pp. 229-259.

Venkataraman, S. (1997) 'The distinctive domain of entrepreneurship research', in Katz, J. A. (Ed.), *Advances in entrepreneurship, firm emergence and growth,* Greenwich, CN: JAI Press.

Westhead, P., Wright, M., and Ucbasaran, D. (2001) 'The internationalization of new and small firms: A resource-based view', *Journal of Business Venturing*, Vo. 16, pp. 333–358.

Woolcock, M. and Narayan, D. (2000) 'Social Capital: Implications for Development Theory, Research, and Policy', *World Bank Research Observer*, Vol. 15, No.2.

Zacher, H. and Frese, M. (2009) 'Remaining time and opportunities at work: relationships between age, work characteristics, and occupational future time perspective', *Psychology and Aging*, Vol. 24, No. 2, pp. 487-493.

Zacher, H. and Frese, M. (2011) 'Maintaining a focus on opportunities at work: the interplay between age, job complexity, and the use of selection, optimization, and compensation strategies', *Journal of Organizational Behavior*, Vol. 32, No. 2, pp. 291–318.

Zahra, S., Korri, J., and Yu, J. (2005) 'Cognition and international entrepreneurship: implications for research on international opportunity recognition and exploitation', *International Business Review*, Vol. 14, No. 2, pp. 129–146.

Zahra, S. A., Ireland, R. D., and Hitt, M. A. (2000) 'International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance', *Academy of Management Journal*, Vol. 43, No. 5, pp. 925–950.

Zain, M. and Ng, S. I. (2006) 'The impacts of network relationships on SMEs' internationalization process', *Thunderbird International Business Review*, Vol. 48, No. 2, pp. 183-205.

Zider, B. (1998) 'How Venture Capital works', *Harvard Business Review*, Nov 1998, pp. 131-139.

Zhou, L. (2007) 'The effects of entrepreneurial proclivity and foreign market knowledge on early internationalization', *Journal of World Business*, Vol. 42, pp. 281–293.

Zucchella, A. (2001) 'The internationalisation of SMEs: Alternative hypotheses and empirical survey', in J. H. Taggart, M. Berry, and M. McDermott (Eds.), *Multinationals in a new era*, Basingstoke: Palgrave, pp. 47-60.

Zucchella, A., Denicolai, S., and Palamara, G. (2007) 'The drivers of the early internationalization of the firm', *Journal of World Business*, Vol. 42, pp. 268–280.

International Business Review 23 (2014) 272–283

Contents lists available at SciVerse ScienceDirect

International Business Review

journal homepage: www.elsevier.com/locate/ibusrev

Born globals: A cross-country survey on high-tech start-ups

Giusy Cannone, Elisa Ughetto *

Politecnico di Torino, DIGEP, Italy

ARTICLE INFO

Article history:
Received 30 July 2012
Received in revised form 26 March 2013
Accepted 9 May 2013

Keywords:
Born globals
Degree of born-globalness
High-tech start-ups
ICT

ABSTRACT

The paper empirically investigates what drivers affect the decisions of high-tech start-ups to internationalize from the outset, and their degree of born-globalness. The empirical data have been obtained from a cross-country survey on internationalized high-tech start-ups operating in the ICT and electronics sectors. The present findings show that the presence of a small domestic market and the scalability of the product put on sale have a positive effect on the probability of a start-up internationalizing from its inception. We have also observed that the niche strategy and the network relationships built up by the entrepreneur are key drivers for both an early internationalization and the scope of international expansion. The experiential knowledge and international commitment of an entrepreneur, as well as the diversity of team competences and organizational flexibility of a firm, have a significant impact on a born global's degree of born-globalness, although it is not a fundamental precondition for early internationalization.

1. Introduction

The internationalization process of firms has been investigated extensively over the past few decades. An important stream of research has originated from what was later labeled the Uppsala Internationalization Model (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). This school of thought posited that firms gradually internationalize through a series of evolutionary stages. A great deal of empirical research in the international business field has adopted this type of approach to study internationalization positions, paths and processes.

However, over the last two decades, the observation that an increasing number of firms aim for international markets right from their start has seriously challenged the stage model and has attracted the interest of several scholars (see, for a review, Jones, Coviello, & Tang, 2011; Keupp & Gassmann, 2009; Kiss, Danis, & Cavusgil, 2012). These firms, which are often small and technology-oriented, tend to adopt a global market vision from the outset and embark on rapid and dedicated internationalization through exportation or any other entry mode, thus skipping some stages of the traditional internationalization process (Knight & Cavusgil, 1996). The most common term to identify these companies is "born globals" (Rennie, 1993; Knight & Cavusgil, 1996; Madsen & Servais, 1997).[1]

The present study can be considered to lie at the intersection between the international business and entrepreneurship fields and adds to the literature in three ways. First, we have been interested in investigating what drives the emergence of the born-global phenomenon through an integration of explanations situated at different levels of analysis. Born globals have here been categorized as those firms that started their foreign operations within 3 years of inception and which have derived at least 25% of their turnover from outside their home market within 3 years, this being in line with the definition originally suggested by Knight and Cavusgil (1996). The accelerated international expansion process, and the form that it takes on, may encompass elements of the entrepreneurs' traits, of the networks to which they are connected, of the domestic environment and of a firm's business activities. Although there are many theoretical and empirical contributions on born globals (and more generally on international entrepreneurship), it seems that the literature still lacks a unifying paradigm that incorporates perspectives from different domains (Jones et al., 2011; Keupp & Gassmann, 2009). Accordingly, we have proposed a theoretical framework that builds upon the model developed by Oviatt and McDougall (2005). It is important to point out that the original model by Oviatt and McDougall (2005) deals with the influences on the speed of entrepreneurial internationalization. In this paper, the original model has been adapted and modified in order to shed some light on the different influences that affect the born global phenomenon. The analysis framework also represents a basis on which further debate and alternative views may be built.

Second, an attempt has been made to empirically investigate the factors that mainly drive a firm's probability of internationalizing from the outset. This has been obtained by conducting a

* Corresponding author at: Politecnico di Torino, DIGEP, Corso Duca degli Abruzzi, 24, 10129 Torino, Italy. Tel.: +39 0115647275.
E-mail address: elisa.ughetto@polito.it (E. Ughetto).

[1] Such companies have also been named global start-ups (Oviatt & McDougall, 1995), international new ventures (Oviatt & McDougall, 1994, 1997), born internationals (Kuivalainen et al., 2007) or born regionals (Lopez et al., 2009).

0969-5931/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ibusrev.2013.05.003

multivariate explorative analysis in a cross-country context. To date, literature contributions have only offered insight into born global models of internationalization, using both quantitative and qualitative methodologies, for one particular country (Chetty & Campbell-Hunt, 2004; Jantunen, Nummela, Puumalainen, & Saarenketo, 2008; Knight & Cavusgil, 2004; Kuivalainen, Sundqvist, & Servais, 2007; Lopez, Kundu, & Ciravegna, 2009; Zucchella, Palamara, & Denicolai, 2007), while the few attempts made to compare different experiences in several countries have mainly been of a qualitative nature (Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008; Gabrielsson & Pelkonen, 2008; Moen, 2002). Cross-country quantitative survey research in this field of study is somewhat scant and limited by small sample sizes (Johnson, 2004; Loane, Bell, & McNaughton, 2007). This research is one of the first cross-country, multi-level quantitative studies on born globals.

Third, we are interested in examining to what extent the key dimensions identified in the theoretical framework are likely to have an impact on a sub-sample of born global firms that show different degrees of born-globalness. As previously mentioned, some scholars have only questioned the qualification of born globals in terms of time to first exportation and percentage of revenues from the exports, without considering whether these firms engage in activities on multiple and distant markets or in a few nearby countries (Kuivalainen et al., 2007; Lopez et al., 2009). The internationalization strategy of a firm can in fact also be defined in terms of the scope of its international operations. In this paper, a closer look has been taken at a group of born globals, which is defined in terms of scale (export intensity) and time (years from the inception) of internationalization, and two distinct categories have been distinguished: born globals with a high degree of born-globalness and born globals with a low degree of born-globalness. This distinction has been made considering the scope of internationalization (i.e. the number of markets involved). To date, we are not aware of any other study that has examined, through the lenses of an interpretative framework, to what extent the degree of born-globalness of a firm is the result of a complex mix of firm, environmental and entrepreneurial factors.

In order to address these issues, a sample of 445 firms, represented by respondents to a questionnaire survey conducted over the December 2011–February 2012 period, has been analyzed. The surveyed firms are internationalized high-tech start-ups operating in the ICT and electronics sectors, located in different countries throughout the world.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework which has guided the empirical analysis. Section 3 describes the dataset and presents the descriptive statistics and the empirical results. The conclusions are drawn in Section 4.

2. Conceptual framework

In this section, a theoretical framework is proposed that has been built upon the model of influences on the speed of entrepreneurial internationalization developed by Oviatt and McDougall (2005). The authors stated that speed is enabled by technology, motivated by competition, mediated by the entrepreneur's perceptions and moderated by the knowledge intensity of the opportunity and a firm's international networks. In the present paper, we are not looking specifically at the speed of internationalization, although the concept of born globals clearly incorporates it. We believe that the model by Oviatt and McDougall (2005) can easily be adapted and modified to fit our specific research questions. Hence, we have departed from that model and constructed a new framework in order to identify the main drivers that affect the probability of a company internationalizing from its inception. Additional insights are provided to look at firms with different degrees of born-globalness. The framework is intended to guide the empirical research and to shed some light on the different influences that affect the born global phenomenon and the form that it takes on.

As shown in Fig. 1, the process that leads a firm to start internationalizing at its inception begins with a potential international entrepreneurial opportunity. The extent to which the international entrepreneurial opportunity is recognized, evaluated and exploited depends on a number of conditions (both exogenous and endogenous to the firm), which can be grouped into five main categories: technology, home country conditions, the entrepreneur, network relationships and firms attributes. These dimensions can exert various degrees of pronounced effects on the born globals, according to their degree of born-globalness.

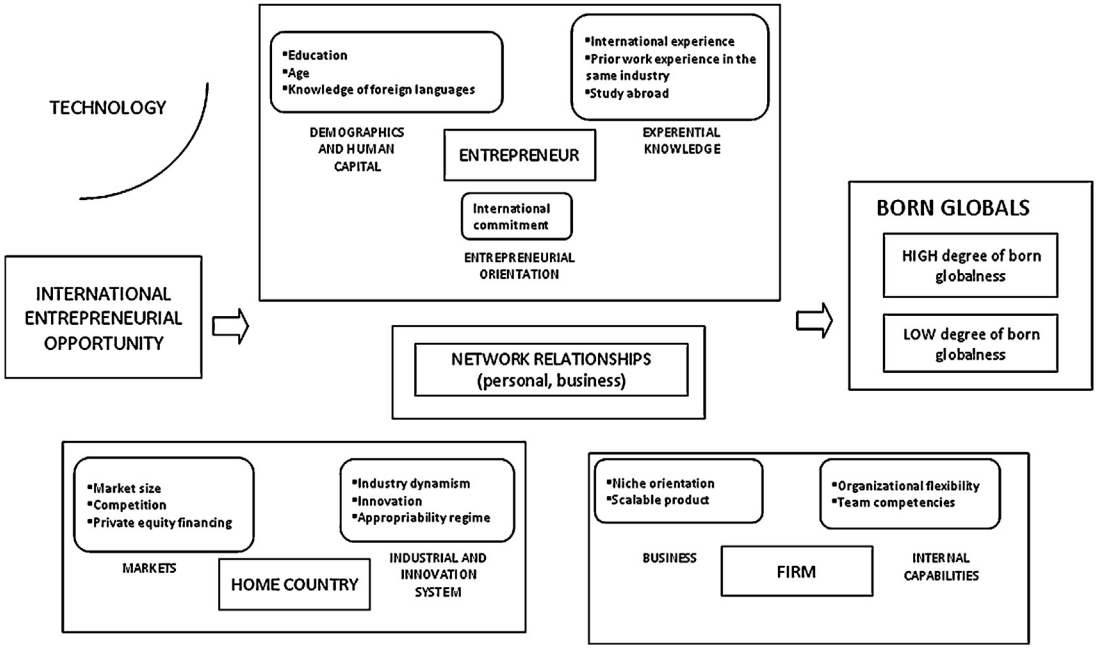


Fig. 1. Theoretical framework.

2.1. Technology

The probability of a company internationalizing from the outset is potentially affected by social and economic changes, ranging from new market conditions (greater demand for specialized or customized products) and globalization of the economy, to an increased international human capital mobility. These changes have been propelled by technological advances in communication, information and transportation (Knight & Cavusgil, 1996; Madsen & Servais, 1997; Oviatt & McDougall, 1994). Rapid technological changes also force technology-based firms to target foreign markets earlier in their life in order to avoid obsolescence of technology or imitation processes (Andersson, Gabrielsson, & Wictor, 2004).

2.2. Home country conditions

Home country influences can affect the probability of a company becoming a born global. Oviatt and McDougall (2005) identified competition as a motivating force driving the speed of internationalization. We argue that, together with competition, other factors connected to home country conditions can encourage or even force early internationalization upon entrepreneurs. We have grouped these factors into two categories: markets, and industrial and innovation systems. The first category concerns the characteristics of the home market, in terms of size, level of competition and availability of private equity finance.

A domestic market that is perceived as being too small propels companies to internationalize early on in their life. Born globals in fact first emerged in countries with small and saturated domestic markets, although today they are appearing in large numbers throughout the world (Knight & Cavusgil, 2004; Madsen & Servais, 1997; Oviatt & McDougall, 1995).

Tough competition on the home market is a major force that influences the propensity of a firm to internationalize from its inception. The competition exerted by larger and more established companies on the domestic market compels start-ups to conceive their business in global terms from the very beginning (Oviatt & McDougall, 1995).

Due to their small size and youth, born globals face significant financial constraints, which make the successful acquisition of private equity financing, such as venture capital financing, of crucial importance. Moreover, the financing structure that is required to sustain a pervasive global expansion also needs to be global (Gabrielsson, Sasi, & Darling, 2004). It follows that a low availability of private equity finance in a home country can encourage early internationalization, and motivate entrepreneurs to move into countries where they have a high chance of receiving this source of funding (Oviatt & McDougall, 1995; Mathews & Zander, 2007).

The technological dynamism and growth potential of a home country's industrial system can be regarded as another determinant that drives entrepreneurs to target foreign markets at their inception. Firms operating in industries characterized by rapid technological change are forced to internationalize rapidly to avoid obsolescence of technology or imitation processes (Andersson et al., 2004). This is particularly true for firms that make information technology products (such as software), which can easily be replicated at low marginal costs. Moreover, rapidly growing industries that have not yet reached maturity provide better chances for small and dynamic companies to exploit proprietary knowledge and gain first mover advantages on foreign markets.

As the challenge for competitiveness, especially in advanced countries, has shifted toward the ability to create and then commercialize new products and processes, a country's innovative capacity is fundamental to stimulate the rise and development of technology-intensive start-ups. This capacity reflects the conditions, investments, and policy choices that create the environment for innovation. The strength of patent protection is another relevant component that shapes a company's internationalization trajectory. It is generally argued that strong patent protection is fundamental to attract foreign direct investments and large volumes of licensed technology and that weak patent rights are a barrier to firms that want to expand in countries that pose a strong threat of imitation (Maskus & Penubarti, 1995). Given the knowledge-intensive nature of born globals, strong determinants for their accelerated entrance onto international markets are a low tendency to innovate in the home country, coupled with a weak appropriability regime (Fernhaber, McDougall, & Oviatt, 2007).

2.3. The entrepreneur

The international entrepreneurial opportunity is recognized, evaluated and exploited by the entrepreneur through the lenses of his/her personal characteristics and attitudes (Oviatt & McDougall, 2005). The entrepreneur will decide whether to enact the international entrepreneurial opportunity, by leveraging on his/her experiential knowledge, educational background and entrepreneurial orientation.

The main features of the entrepreneur have been grouped into three categories: human capital, international commitment and experiential knowledge. The importance of the entrepreneur in the international development of new ventures has been emphasized in many studies: the background, international attitude, motivation, experience, and expertise are generally regarded as the key factors that can influence his/her engagement in international operations (Ruzzier, Antoncic, Hisrich, & Konecnik, 2007; Westhead, Wright, & Ucbasaran 2001). Human capital related factors such as age, a high level of education, and a proficiency in foreign languages are generally believed to be catalysts for internationalization choices, especially for dynamic start-ups that aim at internationalizing from their outset (Madsen & Servais, 1997; Oviatt & McDougall, 1997). The international entrepreneurial orientation of the entrepreneur has been analyzed over different dimensions, such as his/her risk attitude, proactivness, motivation and innovation propensity (Johnson, 2004; Kuivalainen et al., 2007). The entrepreneurial orientation of the entrepreneur has here been tested by looking at his/her international commitment.

The experiential knowledge accumulated by the entrepreneur through his/her exposure to foreign cultures (through prior work or study experiences) has also been proposed as playing an important role in early internationalization. To the extent that the entrepreneur has prior knowledge on the markets where his/her company is seeking to operate, barriers in languages, culture and business practices are overcome and the likelihood to internationalize early is enhanced (Chetty & Campbell-Hunt, 2004; Madsen & Servais, 1997; Schwens & Kabst, 2009).[2] Entrepreneurs with prior experience in the same industry as their current firm can accumulate industry-specific know-how, which allows them to become acquainted with their customers and to develop more appropriate market niches (Westhead et al., 2001).

2.4. Network relationships

Oviatt and McDougall (2005) highlight that the entrepreneur uses established network links to explore how quickly an

[2] This assumption does not always find empirical support in other contributions. The paper by Vissak, Zhang, and Ukrainski (2012) suggests that born globals can internationalize rapidly, despite having less experiential knowledge and less knowledge about foreign markets than slower internationalizers.

international opportunity can be exploited. The authors identify three aspects of networks: the strength of network ties, the size and density of networks. The establishment and development of network ties are significant determinants of the nature of international entry and expansion (Schwens & Kabst, 2009; Sharma & Blomstermo, 2003). First, access to international personal and business networks (such as distributors, subcontractors and customers) has an influence on an entrepreneur's ability to acquire external resources to use for the development, production and launching of a product (Loane et al., 2007). Second, networks are a source of information to firms about foreign markets. Third, networks help entrepreneurs create strategic alliances or cooperation agreements with other partners and to enhance their credibility on foreign markets (Oviatt & McDougall, 2005).

2.5. Firm attributes

Other factors connected to the characteristics of the firm, both in terms of business and internal capabilities, are assumed to affect the probability of a company becoming a born global. Strategic focusing positioning, the nature of the sold product, the presence of diversified expertise within the management team and the organizational flexibility of a company can in fact impact upon the propensity of a firm to internationalize from the outset. The adoption of a niche market strategy, for example, largely determines the likelihood of a firm internationalizing from the outset. Start-ups find it difficult to achieve economies of scale in production and/or marketing, and this makes competition with larger and more experienced firms harsher (Knight & Cavusgil, 1996, 2004; Oviatt & McDougall, 1994). When the target market segment is small, a firm tends to address several markets at once in order to reach a sustainable scale and internationalization is achieved rapidly (Oviatt & McDougall, 1995).

In order to achieve considerable foreign market success in niche areas, born globals have to offer unique and highly specialized products/services or leading edge technologies, by leveraging innovativeness, knowledge and internal capabilities (Gabrielsson & Kirpalani, 2004). In certain technology intensive sectors, such as electronics and information and communication technology, the product presents a key characteristic that may facilitate the rapid internationalization of the companies that develop and commercialize it, which is its high scalability.[3] Once a product is created and the set-up costs are established, it is easy to sell large volumes of it worldwide at very limited variable costs (limited or no transportation and inventory costs).

The organizational flexibility and adaptability of a firm is paramount to ensure the exploitation of promising market opportunities, the success of an internationalization strategy and the speed and nature of internationalization (Knight & Cavusgil, 1996, 2004; Oviatt & McDougall, 1994; Madsen & Servais, 1997; Westhead et al., 2001). The management team's combined knowledge is also important for rapid internationalization, especially in knowledge-based sectors (Loane et al., 2007).

3. Methods

3.1. Data

The empirical data used to test the theoretical framework have been obtained from a survey conducted over the December 2011–February 2012 period on internationalized high-tech start-ups operating in the ICT and electronics sectors and located in different countries throughout the world.[4] All the firms in the sample are independent companies, in which the entrepreneurs and top management are frequently the same. The basic data and e-mail contacts for the surveyed companies have been extracted from CrunchBase,[5] a free high technology company and investor database with global geographical focus. The present analysis is based on data that was obtained from CrunchBase in October 2011. At that date, the database included information on 73,985 technology companies. The dataset provides some basic information on each company, such as the year of establishment, the industrial field, the number of employees, the number of financing rounds and money raised for each round, as well as full contact information.

Due to the retrospective nature of the study, companies founded before 1995 were excluded in order to ensure that there was sufficient corporate memory to provide an accurate recalling of the circumstances surrounding the first internationalization decision. Moreover, the phenomenon of born globals has only started to spread internationally over the last 15–20 years (Jones et al., 2011). The rationale behind the choice of the ICT and electronics sectors is that born global strategies tend to emerge most clearly in industries in which both small size and global competition predominate, such as the ICT sector (Chetty & Campbell-Hunt, 2004). In particular, it was decided to concentrate on companies operating in the following sub-fields (according to the CrunchBase definition): advertising, e-commerce, enterprise, games and video, mobile, network hosting, search, security and software.

This resulted in a sample of 38,585 start-up companies located worldwide. Firms with missing information on e-mail addresses were excluded, thus a reduced dataset of 16,921 firms was obtained. The sample was restricted to only internationalized firms. The presence of at least one international office, which could even be in the form of a simple desk in an incubator or co-working space was used as a screening criterion. This operation led the sample to be further reduced to 2604 companies.

Questionnaires were sent out electronically over the December 2011–February 2012 period. A follow-up was undertaken by sending reminders to those who had not responded after 6 weeks from the first mailing. The respondents were assured confidentiality. A total of 522 responses were gathered, yielding an effective response rate of about 20%, which is in line with previous studies in the field (Knight & Cavusgil, 2004). Non-response bias was checked on a number of variables based on the notion that late respondents would be more like non respondents than earlier respondents (Armstron & Overton, 1977). The results showed that the non response bias was minimal, with respect to all the questionnaire items. Observations with missing values in the variables used in the empirical analysis were dropped, and the sample was thus reduced to 445 companies.

3.2. Descriptive statistics

While a precise and universally accepted set of definitional criteria for a firm to be classified as a born global does not exist, it was decided to use the definition originally suggested by Knight and Cavusgil (1996) and which has been extensively employed in

[3] "Scalability is the ability of a computer application or product (hardware or software) to continue to function well when it is changed in size or volume in order to meet a user's needs" (TechTarget's IT encyclopedia, http://searchdatacenter.techtarget.com/).

[4] While there is large consensus in the literature about the non-homogeneous distribution of born globals among different sectors (Fernhaber et al., 2007; Madsen & Servais, 1997), it seems that rapidly internationalizing firms are more prevalent in knowledge-intensive or technology based sectors (Jones, 1999; Knight & Cavusgil, 2005; Laanti, Gabrielsson, & Gabrielsson, 2007). Other authors believe that the born global phenomenon could potentially affect all industries (see Rennie, 1993).

[5] CrunchBase is operated by TechCrunch, which is located in the Silicon Valley (California), and is one of the most popular Internet blogs on technological innovations. The dataset is quite new and it shows a good potential for research purposes. The dataset can be found at http://www.crunchbase.com/.

Table 1
Frequency distribution of sample firms across different geographical areas (OICs, BGs, BGs_H and BGs_L).

Geographical area	Entire sample		OICs		BGs		BGs_H		BGs_L	
Europe	216	48.54%	76	42.70%	140	52.43%	82	54.67%	58	49.57%
North America	126	28.31%	55	30.90%	71	26.59%	40	26.67%	31	26.50%
Asia	60	13.48%	29	16.29%	31	11.61%	15	10.00%	16	13.68%
Central and South America	28	6.29%	12	6.74%	16	5.99%	7	4.67%	9	7.69%
Oceania	10	2.25%	4	2.25%	6	2.25%	5	3.33%	1	0.85%
Africa	5	1.12%	2	1.12%	3	1.12%	1	0.67%	2	1.71%
All countries	445	100%	178	100%	267	100%	150	100%	117	100%
Sector										
Advertising	32	7.19%	13	7.30%	19	7.12%	9	6.00%	10	8.5%
E-commerce	39	8.76%	23	12.92%	16	5.99%	8	5.33%	8	6.8%
Enterprise	16	3.60%	7	3.93%	9	3.37%	5	3.33%	4	3.4%
Games and video	19	4.27%	2	1.12%	17	6.37%	9	6.00%	8	6.8%
Mobile	48	10.79%	22	12.36%	26	9.74%	14	9.33%	12	10.3%
Network hosting	5	1.12%	2	1.12%	3	1.12%	2	1.33%	1	0.9%
Search	9	2.02%	5	2.81%	4	1.50%	3	2.00%	1	0.9%
Security	7	1.57%	5	2.81%	2	0.75%	2	1.33%	0	0.0%
Software	155	34.83%	52	29.21%	103	38.58%	64	42.67%	39	33.3%
Web	115	25.84%	47	26.40%	68	25.47%	34	22.67%	34	29.1%
All sectors	445	100%	178	100%	267	100%	150	100%	117	100%

other studies (Jantunen et al., 2008; Knight & Cavusgil, 2004; Moen, 2002). Consequently, firms that started their foreign operations within 3 years of inception and which have derived at least 25% of their turnover from outside their home market within 3 years were categorized as born globals. Out of 445 firms, 267 met these criteria and were classified as born globals (BGs) (60%), while the remaining 178 companies (40%) were categorized as other internationalizing companies (OICs).

As suggested by Kuivalainen et al. (2007), this definition considers the time and scale of internationalization, but not the global reach a firm has in its operations. A group of born globals can include firms with different degrees of internationalization: while some firms quickly diversify geographically, others might have operations in only a few countries. Hence, a distinction was made considering the scope of internationalization. Two categories were identified based on the upper quartiles of the distribution of the number of countries involved. Firms falling in the top quartile of the distribution (10 or more than 10 countries involved) were classified as born globals with a high degree of born-globalness (BGs_H), while firms targeting less than 10 countries were classified as born globals with a low degree of born-globalness (BGs_L). Out of 267 BGs, 150 (56.18%) were BGs_H and 117 (43.82%) were BGs_L.

Table 1 shows the distribution of the OICs and BGs across different geographical areas and sectors. Out of 445 firms, 34.8% operate in the software sector, 25.8% in the web sector and 10.8% in the mobile sector. The software and web sectors account for 64% of the BGs (65.3% for BGs_H and 62.40% for BGs_L) and 55.6% of the OICs. As far as the geographical distribution of the surveyed companies is conceived, Europe and North America are the most represented countries (with 48.5% and 28.3% respectively), and they are followed by Asia (13.5%), Central and South America (6.3%) and Africa and Oceania (3.4%).[6] Among the BGs, Europe represents 52.4% of the sample (54.7% for BGs_H and 49.57% for BGs_L), and it is followed by North America (26.6%, and 26.6% for BGs_H and 26.50% for BGs_L); instead, the OICs are mainly found in North America (42.7%), while Europe accounts for 30.9%.

[6] Our sample consists of 47 countries: Argentina, Australia, Austria, Bangladesh, Belgium, Luxembourg, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Ireland, Israel, Italy, Japan, Lebanon, Lithuania, Netherlands, Nigeria, Norway, Poland, Qatar, Romania, Russian Federation, Serbia and Montenegro, Singapore, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, United Kingdom, United States of America, Uruguay.

Table 2 reports the relative importance of the dimensions identified in the theoretical framework as drivers of early internationalization. The respondents were asked to rate the importance of various factors that influenced their decision to internationalize on a 5-point Likert scale, where 1 was not important and 5 was very important. The Table shows the average score for each variable and the frequency distribution for the entire sample and for the sub-samples of OICs, BGs, BGs_H and BGs_L. The Table also illustrates the results of two-tail *t*-tests with unequal variances conducted to statistically compare the means of the considered variables across the two groups of firms (BGs vs OICs and BGs_H vs BGs_L).

The highest ranked variable for both groups of companies (BGs and OICs) is INTERNATIONAL COMMITTMENT, which accounts for an average score of 4.850 and 4.763, respectively, with a high percentage of the respondents reporting it was very important (88.76% and 83.05% respectively). Within the group of BGs, firms that show a high degree of born-globalness assigned an average score of 4.9 to this dimension. The *t*-test rejects the null hypothesis of equal means in the scores between BGs_H and BGs_L at the 1% significance level ($t = 2.79$, $p < 0.01$). SCALABLE PRODUCT is the second highest ranked variable for both BGs (4.457 score, with 68.54% of the companies reporting it was very important) and OICs (4.104 score, with 57.30% of the respondents reporting it was very important). The difference in the means between the BG and OIC groups (as well as between BGs_H and BGs_L) is significant at the conventional levels. The most remarkable difference between BGs and OICs is the importance assigned to the considered factors concerning the variables MARKET SIZE, NICHE ORIENTATION and COMPETITION. On average, the BGs assigned 22.4% and 14.7% higher scores to a small domestic market and to the niche orientation strategy, compared to the OICs. The equality of means in both market size and niche orientation variables between the two groups of companies was rejected at the 1% level of significance. Instead, OICs seemed to give a 19.3% higher evaluation to the presence of high competition on the home market compared to their born global peers.

3.3. Results

A listing of the variables used in the empirical analysis, along with their definitions, is provided in the Appendix (Table A.1). The linear correlation analysis of the regressors is reported in Table A.2. As the correlation matrix shows, the explanatory variables are not

Table 2
Relevance of the factors affecting internationalization: average score and frequency distribution of OICs, BGs, BGs_H and BGs_L.

		Average score	1	2	3	4	5	*N*
MARKET SIZE	*Total*	2.577	43.82%	9.89%	12.13%	13.03%	21.12%	445
	BGs	2.831	36.70%	11.24%	11.61%	13.11%	27.34%	267
	OICs	2.196	54.49%	7.87%	12.92%	12.92%	11.80%	178
	BGs_H	2.926	33.33%	10.67%	14.00%	14.00%	28.00%	150
	BGs_L	2.709	41.03%	11.97%	8.55%	11.97%	26.50%	117
	T-test for difference (BGs vs OICs) $t = 4.19^{***}$							
	T-test for difference (BGs_H vs BGs_L) $t = 3.22^{***}$							
COMPETITION	*Total*	1.739	60.67%	20.00%	8.76%	5.84%	4.72%	445
	BGs	1.614	64.79%	20.60%	5.99%	5.62%	3.00%	267
	OICs	1.926	54.49%	19.10%	12.92%	6.18%	7.30%	178
	BGs_H	1.573	63.33%	24.00%	6.67%	4.00%	2.00%	150
	BGs_L	1.667	66.67%	16.24%	5.13%	7.69%	4.27%	117
	T-test for difference (BGs vs OICs) $t = -2.75$							
	T-test for difference (BGs_H vs BGs_L) $t = -2.41$							
NICHE ORIENTATION	*Total*	3.006	30.79%	9.44%	15.06%	17.75%	26.97%	445
	BGs	3.194	27.34%	7.87%	14.98%	17.60%	32.21%	267
	OICs	2.725	35.96%	11.80%	15.17%	17.98%	19.10%	178
	BGs_H	3.28	23.33%	9.33%	16.00%	18.67%	32.67%	150
	BGs_L	3.085	32.48%	5.98%	13.68%	16.24%	31.62%	117
	T-test for difference (BGs vs OICs) $t = 3.06^{***}$							
	T-test for difference (BGs_H vs BGs_L) $t = 2.59^{***}$							
INNOVATION	*Total*	1.930	57.53%	14.83%	11.46%	9.44%	6.74%	445
	BGs	1.932	57.30%	14.61%	12.36%	8.99%	6.74%	267
	OICs	1.927	57.87%	15.17%	10.11%	10.11%	6.74%	178
	BGs_H	1.96	53.33%	17.33%	15.33%	8.00%	6.00%	150
	BGs_L	1.879	62.39%	11.11%	8.55%	10.26%	7.69%	117
	T-test for difference (BGs vs OICs) $t = 0.04$							
	T-test for difference (BGs_H vs BGs_L) $t = 0.35$							
SCALABLE PRODUCT	*Total*	4.330	6.29%	3.15%	5.84%	20.67%	64.04%	445
	BGs	4.457	4.12%	2.25%	5.99%	19.10%	68.54%	267
	OICs	4.104	9.55%	4.49%	5.62%	23.03%	57.30%	178
	BGs_H	4.493	3.33%	2.00%	5.33%	20.67%	68.67%	150
	BGs_L	4.410	5.13%	2.56%	6.84%	17.09%	68.38%	117
	T-test for difference (BGs vs OICs) $t = 2.76^{***}$							
	T-test for difference (BGs_H vs BGs_L) $t = 2.35^{***}$							
APPROPRIABILITY REGIME	*Total*	1.721	61.80%	15.28%	14.61%	5.62%	2.70%	445
	BGs	1.708	62.17%	16.10%	13.86%	4.49%	3.37%	267
	OICs	1.741	61.24%	14.04%	15.73%	7.30%	1.69%	178
	BGs_H	1.726	57.33%	20.00%	17.33%	3.33%	2.00%	150
	BGs_L	1.684	68.38%	11.11%	9.40%	5.98%	5.13%	117
	T-test for difference (BGs vs OICs) $t = -0.32$							
	T-test for difference (BGs_H vs BGs_L) $t = 0.07$							
INDUSTRY DYNAMISM	*Total*	3.237	22.02%	6.97%	20.67%	25.17%	24.72%	445
	BGs	3.268	21.72%	7.12%	18.73%	26.22%	25.47%	267
	OICs	3.191	22.47%	6.74%	23.60%	23.60%	23.60%	178
	BGs_H	3.28	22.00%	5.33%	20.67%	26.67%	25.33%	150
	BGs_L	3.252	21.37%	9.40%	16.24%	25.64%	25.64%	117
	T-test for difference (BGs vs OICs) $t = 0.54$							
	T-test for difference (BGs_H vs BGs_L) = 0.44							
PRIVATE EQUITY FINANCING	*Total*	2.056	54.61%	13.93%	11.69%	10.79%	8.99%	445
	BGs	2.146	51.69%	13.86%	13.48%	10.11%	10.86%	267
	OICs	1.921	58.99%	14.04%	8.99%	11.80%	6.18%	178
	BGs_H	2.073	55.33%	14.67%	8.00%	11.33%	10.67%	150
	BGs_L	2.239	47.01%	12.82%	20.51%	8.55%	11.11%	117
	T-test for difference (BGs vs OICs) $t = 1.71^{*}$							
	T-test for difference (BGs_H vs BGs_L) = 0.18							
NETWORK RELATIONSHIPS	*Total*	2.303	34.61%	41.12%	0.00%	7.87%	16.40%	445
	BGs	2.315	34.08%	41.57%	0.00%	7.49%	16.85%	267
	OICs	2.286	35.39%	40.45%	0.00%	8.43%	15.73%	178
	BGs_H	2.42	32.67%	40.00%	0.00%	7.33%	20.00%	150
	BGs_L	2.179	35.90%	43.59%	0.00%	7.69%	12.82%	117
	T-test for difference (BGs vs OICs) $t = 0.20$							
	T-test for difference (BGs_H vs BGs_L) = 1.19							
INTERNATIONAL EXPRIENCE	*Total*	3.326	30.1%	0.0%	12.6%	21.8%	35.5%	445
	BGs	3.266	33.0%	0.0%	11.2%	19.1%	36.7%	267
	OICs	3.416	25.8%	0.0%	14.6%	25.8%	33.7%	178
	BGs_H	3.4	30.7%	0.0%	9.3%	18.7%	41.3%	150
	BGs_L	3.094	35.9%	0.0%	13.7%	19.7%	30.8%	117
	T-test for difference (BGs vs OICs) $t = -0.95$							
	T-test for difference (BGs_H vs BGs_L) = 0.66							

Table 2 (*Continued*)

		Average score	1	2	3	4	5	*N*
INTERNATIONAL COMMITMENT	*Total*	4.815	0.00%	1.13%	2.70%	9.68%	86.49%	445
	BGs	4.850	0.00%	1.12%	1.50%	8.61%	88.76%	267
	OICs	4.763	0.00%	1.13%	4.52%	11.30%	83.05%	178
	BGs_H	4.9	0.00%	0.67%	0.67%	6.67%	92.00%	150
	BGs_L	4.786	0.00%	1.71%	2.56%	11.11%	84.62%	117
		T-test for difference (BGs vs OICs) $t = 1.66^{*}$						
		T-test for difference (BGs_H vs BGs_L) = 2.79^{***}						

* Significant at the 10% level.
*** Significant at the 1% level.

Table 3
Probit model on the probability that a start-up internationalizes from its inception.

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
MARKET SIZE	0.130***	0.130***	0.139**	0.143**	0.115**	0.117**
	(0.050)	(0.050)	(0.056)	(0.056)	(0.058)	(0.058)
COMPETITION	−0.196***	−0.192***	−0.166**	−0.168**	−0.162**	−0.163**
	(0.063)	(0.063)	(0.073)	(0.073)	(0.075)	(0.075)
INNOVATION	−0.036	−0.033	−0.062	−0.062	−0.092	−0.093
	(0.067)	(0.068)	(0.076)	(0.076)	(0.077)	(0.077)
APPROPRIABILITY REGIME	0.026	0.024	−0.003	0.000	0.001	0.002
	(0.083)	(0.083)	(0.091)	(0.091)	(0.091)	(0.091)
INDUSTRY DYNAMISM	0.011	0.010	0.014	0.016	−0.014	−0.012
	(0.048)	(0.048)	(0.054)	(0.054)	(0.055)	(0.055)
PRIVATE EQUITY FINANCING	0.046	0.039	0.056	0.048	0.061	0.056
	(0.057)	(0.057)	(0.065)	(0.065)	(0.065)	(0.065)
NETWORK RELATIONSHIPS			0.117**	0.113**	0.098*	0.094*
			(0.056)	(0.056)	(0.058)	(0.058)
INTERNATIONAL COMMITTMENT			0.145	0.129	0.117	0.101
			(0.134)	(0.132)	(0.137)	(0.136)
INTERNATIONAL EXPERIENCE			0.031	0.035	0.028	0.031
			(0.045)	(0.045)	(0.046)	(0.046)
STUDY ABROAD			−0.174	−0.176	−0.213	−0.215
			(0.161)	(0.161)	(0.164)	(0.164)
EDUCATION			0.309	0.282	0.397	0.373
			(0.263)	(0.264)	(0.268)	(0.269)
INDUSTRY EXPERIENCE			0.023	0.021	0.026	0.024
			(0.151)	(0.151)	(0.153)	(0.153)
AGE			−0.003	−0.003	−0.003	−0.003
			(0.010)	(0.010)	(0.010)	(0.010)
FOREIGN LANGUAGES			0.141*	0.143*	0.164**	0.166**
			(0.075)	(0.076)	(0.077)	(0.078)
NICHE ORIENTATION					0.084*	0.086*
					(0.051)	(0.051)
SCALABLE PRODUCT					0.145**	0.148**
					(0.066)	(0.066)
TEAM COMPETENCES					−0.081	−0.081
					(0.154)	(0.155)
SIZE					−0.010	−0.010
					(0.013)	(0.013)
LEGALITY INDEX	0.030	0.028	0.020	0.018	0.014	0.013
	(0.021)	(0.021)	(0.024)	(0.023)	(0.024)	(0.024)
ENTREPRENEURIAL ORIENTATION	0.016*	0.017*	0.017*	0.017*	0.017*	0.017*
	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
YEAR	−0.039		−0.047		−0.042	
	(0.034)		(0.036)		(0.037)	
MSCI		−0.026		−0.015		−0.017
		(0.021)		(0.023)		(0.023)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	445	445	445	445	445	445
Pseudo *R*-squared	0.128	0.128	0.164	0.161	0.181	0.179

Note: Dependent variable: BGs. The regressions contain industry and country dummies (not reported to save space). Standard errors in parenthesis.
* Significant coefficients are indicated by (10% level).
** Significant coefficients are indicated by (5% level).
*** Significant coefficients are indicated by (1% level).

highly correlated to each other. A set of probit models was run to test the determinants that affect the probability of a start-up internationalizing from its inception and that a born global widely diversifies geographically. Time, country and industry dummies were included in each model, as well as controls for the state of the stock markets, for the national legal conditions and for the level of entrepreneurial propensity of the home country during the internationalization year.

Table 4
Probit model on the probability that a born global displays a high degree of born globalness.

Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
MARKET SIZE	0.111*	0.102*	0.086	0.079	0.096	0.092
	(0.062)	(0.062)	(0.072)	(0.070)	(0.078)	(0.077)
COMPETITION	−0.092	−0.108	−0.005	−0.017	−0.066	−0.084
	(0.085)	(0.086)	(0.098)	(0.099)	(0.105)	(0.106)
INNOVATION	0.082	0.090	0.165	0.177*	0.231**	0.253**
	(0.084)	(0.084)	(0.102)	(0.102)	(0.110)	(0.111)
APPROPRIABILITY REGIME	0.068	0.056	−0.005	−0.022	−0.027	−0.050
	(0.098)	(0.098)	(0.113)	(0.114)	(0.121)	(0.122)
INDUSTRY DYNAMISM	−0.031	−0.029	−0.049	−0.048	−0.058	−0.055
	(0.061)	(0.061)	(0.070)	(0.070)	(0.073)	(0.073)
PRIVATE EQUITY FINANCING	−0.124	−0.096	−0.110	−0.095	−0.152	−0.137
	(0.070)	(0.068)	(0.079)	(0.077)	(0.084)	(0.083)
NETWORK RELATIONSHIPS			0.157**	0.159**	0.195**	0.202**
			(0.074)	(0.074)	(0.080)	(0.080)
INTERNATIONAL COMMITTMENT			0.313	0.351	0.380*	0.420*
			(0.219)	(0.218)	(0.226)	(0.226)
INTERNATIONAL EXPERIENCE			0.123**	0.119**	0.134**	0.130**
			(0.057)	(0.057)	(0.060)	(0.060)
STUDY ABROAD			0.410*	0.352*	0.491**	0.433*
			(0.223)	(0.221)	(0.237)	(0.235)
EDUCATION			−0.714	−0.719	−0.641	−0.681
			(0.405)	(0.408)	(0.430)	(0.437)
INDUSTRY EXPERIENCE			−0.020	−0.057	−0.051	−0.093
			(0.200)	(0.201)	(0.207)	(0.207)
AGE			0.024*	0.023*	0.027**	0.027**
			(0.013)	(0.013)	(0.013)	(0.014)
FOREIGN LANGUAGES			0.012	0.030	0.058	0.079
			(0.097)	(0.097)	(0.101)	(0.100)
NICHE ORIENTATION					0.131**	0.118*
					(0.066)	(0.066)
SCALABLE PRODUCT					−0.092	−0.103
					(0.104)	(0.104)
TEAM COMPETENCES					0.409*	0.443**
					(0.219)	(0.220)
SIZE					−0.056***	−0.058***
					(0.020)	(0.020)
LEGALITY INDEX	0.070**	0.070**	0.061*	0.057*	0.035	0.031
	(0.029)	(0.029)	(0.033)	(0.033)	(0.036)	(0.035)
ENTREPRENEURIAL ORIENTATION	0.018*	0.017*	0.013**	0.013**	0.012**	0.013**
	(0.015)	(0.015)	(0.025)	(0.025)	(0.026)	(0.026)
YEAR	0.095*		0.073		0.088	
	(0.052)		(0.060)		(0.061)	
MSCI		0.033		0.038		0.051
		(0.027)		(0.030)		(0.032)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	267	267	267	267	267	267
Pseudo *R*-squared	0.109	0.105	0.166	0.166	0.219	0.220

Note: Dependent variable: BGs_H. The regressions contain industry and country dummies (not reported to save space). Standard errors in parenthesis.
* Significant coefficients are indicated by (10% level).
** Significant coefficients are indicated by (5% level).
*** Significant coefficients are indicated by (1% level).

Table 3 shows the effect of the dimensions outlined in the theoretical framework on the probability that a start-up internationalizes from its establishment (dependent variable: BGs). Table 4 restricts the analysis to the sub-sample of born globals and shows the impact of the identified variables on the probability that they show a high degree of born-globalness (dependent variable: BGs_H). Models 1, 3 and 5 report the impact of the outlined dimensions, controlling for the internationalization year. Models 2, 4 and 6 add the MSCI index as an additional control.[7]

The results show that the existence of a small domestic market positively and significantly affects the likelihood of a start-up internationalizing right from its inception. The effect holds for all the model specifications. This evidence is clearly in line with theoretical predictions (Knight & Cavusgil, 2004; Madsen & Servais, 1997; Oviatt & McDougall, 1995). However, the variable partially loses statistical significance when the degree of born-globalness is considered (Models 3 to 6, Table 4). Contrary to our expectations, and to the literature (Oviatt & McDougall, 1995), a significant negative effect was observed for the intensity of competition on the probability of a company internationalizing from its birth. We argue that a home market in which entry barriers for certain industries are low (as in the ICT industry) and which engenders a great deal of competition, has the potential of attracting new entrants, that, however, might not perceive the urgency to move to other countries immediately. Instead, the level of internal competition neither helps nor hurts the propensity of born globals to diversify geographically quickly.

A low tendency to innovate on the home market is not considered to be an important driver of early internationalization, but significantly affects the decision of born globals to broaden

[7] The probit models have been estimated with Stata11.

their global reach (Models 4, 5 and 6, Table 4). Other elements (the degree of patent protection, the dynamism of an industry and the availability of private equity finance in the home country) do not seem to influence the internationalization choice or the degree of born-globalness of the sample firms. This result is in contrast with theoretical predictions that consider a weak appropriability regime (Fernhaber et al., 2007), the technological dynamism and growth potential of the home country's industrial system (Andersson et al., 2004) and a poor availability of private equity finance in the home country (Oviatt & McDougall, 1995; Mathews & Zander, 2007) as strong determinants for firms that choose to internationalize from the outset.

The lack of relevance of the patent protection system may derive from the intrinsic nature of the chosen sample, which consists of firms operating in the ICT industry. It is in fact well known that companies operating in the ICT sectors rely on patent protection to a lesser extent than start-ups operating in science-based sectors (such as pharmaceuticals, chemicals or biotech). The non-significance of the private equity financing variable could be explained by the fact that institutional private equity finance is used by only a small proportion of firms, even among fast-growing ventures and new technology-based firms, especially in countries outside the US (Bottazzi & Da Rin, 2002). Moreover, limited private equity financing for start-ups is often replaced by access to other financial resources by virtue of informal network ties.

In line with the literature (Schwens & Kabst, 2009; Sharma & Blomstermo, 2003; Oviatt & McDougall, 2005), the importance of network relationships as a driver of both early internationalization and the scope of international expansion has in fact been acknowledged by the respondents. Even after controlling for the internationalization year and for the state of the financial markets, a positive and significant effect of the variable was observed in all the model specifications.

Some interesting results have emerged when the role of the entrepreneur was considered. While previous research assigned a prominent role to firms that wanted to internationalize from the outset to human capital related factors, such as age, education, knowledge of foreign languages (Madsen & Servais, 1997; Oviatt & McDougall, 1997), the present results only point to a significant effect for the knowledge of foreign languages. Being proficient in foreign languages is positively associated with the probability of a company internationalizing from its establishment. Knowledge of foreign languages seems to matter more than education or age in setting up a born global company. It is in fact a prerequisite for entrepreneurs who are willing to make business contacts abroad and it helps to form an internationally oriented mindset. However, it is not a discriminating factor that affects a born global's degree of born-globalness.

An entrepreneur's experiential knowledge is particularly important in shaping the scope of the international expansion of born globals, without being a fundamental precondition for early internationalization. This result is partially in contrast with the hypothesis that experiential knowledge enhances the likelihood of internationalizing early (Chetty & Campbell-Hunt, 2004; Madsen & Servais, 1997). In other words, it emerges that the entrepreneurs' prior work and study experience in foreign countries have a significant effect on the degree of international expansion of a born global. While international commitment does not play any role in the understanding of the born global phenomenon, it appears to have a slightly significant effect on born globals that target multiple markets (Models 5–6, Table 4). In fact, entrepreneurs that follow a wider geographical diversification strategy tend to be more entrepreneurially oriented than those that target a limited number of markets.

The estimation results stress the importance exerted by firm-level influences. Niche positioning displays a positive association with both dependent variables, at a 10% level of statistical significance. This result is in line with other theoretical insights (Knight & Cavusgil, 1996, 2004; Oviatt & McDougall, 1994). In addition, as predicted in the theoretical framework, the scalability of the product facilitates the decision of a start-up to internationalize early, but it does not have any effect on the scope of internationalization. While it has been predicted that organizational flexibility and diversified team competences are important for firms that aim at internationalizing from the outset (Oviatt & McDougall, 1994; Madsen & Servais, 1997; Westhead et al., 2001; Loane et al., 2007), a significant effect was not found on the probability of being born global. However, the degree of born-globalness appears to be a function of the level of diversity of team competences and is negatively correlated to firm size at the 1% significance level.

Finally, some country dummies (not reported) were significant in the reported models. This indicates that it was important to control for country effects in these data. The nation dummy variables Brazil, Argentina, India, Taiwan and Singapore were positive and significant, while all the other country dummies were not significant, compared to the omitted category US.

4. Conclusion

This study is an attempt to make a contribution to the literature on born globals by examining the determinants of early internationalization in a cross-country context. The born global concept has by now become a complex one in terms of time span, scale and scope. However, the literature has to a great extent ignored the differences that exist among born global firms and the market scope dimension has often been neglected. The present study is a first attempt to perform multi-level research, by examining to what extent the decision to internationalize from the inception, as well as a firm's degree of born-globalness, is the result of factors that occur at a firm, individual and country level.

The results of a survey on internationalized high-tech start-ups operating in the ICT and electronics sectors and located in different countries throughout the world have confirmed that the presence of a small domestic market and the scalability of the product put on sale have a positive effect on the probability of a start-up internationalizing from its inception. It has also been observed that the niche strategy and the network relationships built by the entrepreneur are key drivers for both early internationalization and the scope of international expansion. The ability of the entrepreneur to recognize and exploit opportunities largely depends on his/her entrepreneurial orientation, capabilities and experiential knowledge. In particular, proficiency in foreign languages has proved to matter more than education or age in the decision to internationalize early, while it is not a discriminating factor on a born global's degree of born-globalness. The entrepreneur's experiential knowledge and international commitment, as well as the diversity of team competences and organizational flexibility of a firm have a significant impact on a born global's degree of born-globalness, although it is not a fundamental precondition for early internationalization.

The overall picture obtained from the empirical analysis has highlighted that the choice of the internationalization pathway for a firm is the result of a complex mix of firm, environmental and individual factors. The implications for managers and policy makers are therefore numerous. First, the entrepreneurs with aspirations of early internationalization should be well aware of the importance of consolidated network relationships and of niche positioning, if they want to achieve internationalization rapidly. The adoption of a strategy of focalization is also relevant for those firms that wish to address several markets at once in their early internationalization process. Second, another prerequisite for

aspiring global entrepreneurs is the knowledge of foreign languages, which also helps them to form an international mindset. Third, experience is crucial when the focus is on large scale internationalization and on the opening up of new geographical markets. International commitment and the experiential knowledge of the entrepreneur are in fact of paramount importance in forging the scope of early internationalization.

While born globals are rapidly expanding worldwide, as advances in telecommunication, transportation and technology at large are shrinking physical and cultural distances and facilitating human capital mobility, the extent of their diffusion largely depends upon whether certain conditions are in place. The pace at which firms expand internationally from their inception might be constrained by the absence or limited presence of adequate policies. A deeper understanding of the conditions under which born globals are likely to prosper could stimulate policy makers to sustain a firm's early internationalization through appropriate support programs.

There are some clear limitations in the present work which indicate the necessity of future research. First, the limited size of the sample of born globals and the fact that the survey was only addressed to internationalized firms constitutes a relevant limitation. In addition, since the presence of at least one international office (desk) was used as a selection criterion to identify internationalized firms, it follows that some firms that could have been considered international (because they export through agents or fill in orders from abroad, without reporting an international office) might probably have been overlooked. However, limiting the dataset to only firms with at least one international office (or desk) led to a reduction in the possibility of distorted information on internationalization behavior from the answers to the survey, which could not be verified.

Second, the choice of the dimensions explored in our analysis framework might be incomplete. Future research could extend the exploration of the different influences that affect the phenomenon of born globals by refining the outlined dimensions and by including further elements. The industry structure, the competitive arena, the characteristics of network relationships (strength, size and density), the state of the distribution channels and the host country conditions are assumed to account for many of the variations in internationalization patterns but remain issues that deserve further exploration. Third, we need more information about whether certain fruitful individual-level characteristics may be set off by adverse environmental or firm-level conditions or vice versa. The understanding of the interconnections that exist between the personal characteristics of the entrepreneurs, a firm's strategies and resource bases and the institutional, industrial and economic environment needs to be further elaborated to gain a deeper understanding of the born global phenomenon. Fourth, it would be interesting to test the analysis framework using simulation techniques that would allow moderating/enabling effects on the considered variables to be introduced.

Finally, valuable insights could be derived from a close examination of the distinctive contexts and of the related policies that have to be implemented to facilitate the diffusion of born globals. In this sense, a cross-country comparison of the instruments, programs and laws that are actually in place or an examination of the effects that more or less restrictive policies might have on the speed and breadth of the phenomenon of born globals is rich in potential for future research.

Appendix

See Tables A.1 and A.2

Table A.1
Definition of variables used in the empirical analysis.

Dependent variables	
BGs	Dummy variable that is equal to 1 for firms which started their foreign operations within 3 years of inception and have derived at least 25% of their turnover from outside their home market within 3 years; 0 otherwise
BGs_H	Dummy variable that is equal to 1 for BGs which have an international presence in more than 10 countries; 0 otherwise
Independent variables	
Home Country Conditions	
MARKET SIZE	5-points Likert scale to assess the weight attributed to the small domestic market as a reason to start internationalization
COMPETITION	5-points Likert scale to assess the weight attributed to the high competition in the home market as a reason to start internationalization
PRIVATE EQUITY FINANCING	5-points Likert scale to assess the weight attributed to the limited availability of private equity financing in the home market as a reason to start internationalization
INDUSTRY DYNAMISM	5-points Likert scale to assess the weight attributed to an industry with a growth potential as a reason to start internationalization
INNOVATION	5-points Likert scale to assess the weight attributed to a low tendency to innovate in the home market as a reason to start internationalization
APPROPRIABILITY REGIME	5-points Likert scale to assess the weight attributed to a weak patent protection in the home market as a reason to start internationalization
Entrepreneur	
EDUCATION	Dummy variable which takes value 1 if the entrepreneur has a Master Degree or a Ph.D and 0 otherwise
AGE	Average age of the firm's entrepreneurs at the internationalization time
FOREIGN LANGUAGES	Number of languages spoken by the entrepreneur
INTERNATIONAL EXPERIENCE	5-points Likert scale to assess the weight attributed to a previous international experience of the entrepreneur as a reason to start internationalization
INDUSTRY EXPERIENCE	Dummy variable which takes value 1 if the entrepreneur has a previous experience in the industry as his current firm; 0 otherwise
STUDY ABROAD	Dummy variable which takes value 1 if the entrepreneur has studied abroad and 0 otherwise
INTERNATIONAL COMMITMENT	5-points Likert scale to assess the weight attributed to the international commitment as a reason to start internationalization
Network relationships	
NETWORK RELATIONSHIPS	5-points Likert scale to assess the weight attributed to the presence of an international network of the entrepreneur as a reason to start internationalization
Firm attributes	
NICHE ORIENTATION	5-points Likert scale to assess the weight attributed to the niche strategy as a reason to start internationalization
SCALABLE PRODUCT	5-points Likert scale to assess the weight attributed to having a scalable product as a reason to start internationalization
TEAM COMPETENCES	Dummy variable equal to 1 if among the management team there are at least two different education backgrounds (engineering, natural science, computer science, humanities)

SIZE	Logarithm number of employees at the time of internationalization, proxing the organizational flexibility of the firm.
Controls	
LEGALITY INDEX	Based on Berkowitz, Pistor, and Richard (2003) principal component analysis, following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), it refers to the weighted average of the efficiency of judicial system, rule of law, corruption, risk of expropriation and risk of contract repudiation at country level
ENTREPRENEURIAL ORIENTATION	Average scores on four questions from the Global Entrepreneurship Monitor's (GEM's) Adult Population survey, as in Danis, De Clercq, and Petricevic(2011). The four questions refer to the following dimensions at country level: entrepreneurship as desirable career choice, high status successful entrepreneurship, media attention for entrepreneurship and perceived opportunities.
MSCI	Morgan Stanley Capital International (MSCI) annual index returns for the home country-specific stock markets, measured in the year of the internationalization. Annual returns are used. The index applies country weights based on gross domestic product (GDP).

Table A.2
Pairwise correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
MARKET SIZE (1)	1																	
COMPETITION (2)	0.0744	1																
INNOVATION (3)	0.2463	0.2971	1															
APPROPRIABILITY REGIME (4)	0.2511	0.2750	0.2924	1														
INDUSTRY DYNAMISM (5)	0.1717	0.1625	0.2971	0.2334	1													
PRIVATE EQUITY FINANCING (6)	0.2805	0.1716	0.2843	0.2500	0.2553	1												
NICHE ORIENTATION (7)	0.2390	0.1684	0.1809	0.1710	0.1443	0.0645	1											
SCALABLE PRODUCT (8)	0.0444	−0.1255	0.0856	0.0009	0.1457	0.0237	0.0830	1										
NETWORK RELATIONSHIPS (9)	−0.0826	−0.0541	−0.1357	−0.0056	−0.1382	−0.1562	0.0122	0.0201	1									
INTERNATIONAL COMMITTMENT (10)	0.0431	−0.1059	0.0761	0.0173	0.1847	0.0734	0.0523	0.1576	−0.0569	1								
INTERNATIONAL EXPERIENCE (11)	0.0092	0.0575	0.0345	0.0890	−0.0483	−0.0083	−0.0151	0.0327	0.0209	−0.0467	1							
STUDY ABROAD (12)	−0.0240	−0.0098	−0.1016	−0.0406	0.0057	0.0429	−0.0360	0.0546	−0.1223	−0.0410	−0.1733	1						
EDUCATION (13)	−0.0877	0.0072	−0.0447	0.0023	0.0385	−0.0106	−0.0981	−0.0450	−0.0242	0.0056	−0.0611	0.0715	1					
INDUSTRY EXPERIENCE (14)	0.0231	0.0386	0.0051	−0.0706	0.0446	0.0790	0.0574	0.0053	−0.0981	0.0607	0.0452	0.0151	−0.0632	1				
AGE (15)	−0.0688	−0.0627	−0.0096	0.0140	−0.0045	−0.1009	−0.0099	0.0317	−0.0020	0.0754	−0.0378	0.0217	0.0453	0.0229	1			
TEAM COMPETENCES (16)	−0.0327	−0.0250	−0.0384	−0.0126	−0.0293	−0.0082	−0.0256	0.0264	−0.1595	−0.0154	−0.0095	0.0035	0.0959	−0.0013	0.0657	1		
SIZE (17)	−0.0055	−0.0388	−0.0316	0.0144	−0.0265	−0.0070	0.0004	−0.0538	−0.0983	0.0441	−0.0629	−0.0003	−0.0281	0.0212	0.0511	−0.0318	1	
FOREIGN LANGUAGES (18)	0.0157	0.0110	0.0137	0.0580	0.0117	0.0184	−0.0614	0.0069	−0.0905	0.0164	−0.1446	0.2713	−0.0141	0.0655	0.0200	0.0515	−0.0105	1

To save space, country, sector and year dummies are not reported.

References

Andersson, S., Gabrielsson, J., & Wictor, I. (2004). International activities in small firms: Examining factors influencing the internationalization and export growth of small firms. *Canadian Journal of Administrative Sciences, 21*(1), 22–34.

Armstron, J. S., & Overton, T. S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research, 14*(3), 396–402.

Berkowitz, D., Pistor, K., & Richard, J. F. (2003). Economic development. Legality and the transplant effect. *European Economic Review, 47*, 165–195.

Bottazzi, L., & Da Rin, M. (2002). Venture capital in Europe and the financing of innovative companies. *Economic policy: A European forum, 17*(34), 229–270.

Chetty, S., & Campbell-Hunt, C. (2004). A strategic approach to internationalization: A traditional versus a born global approach. *Journal of International Marketing, 12*(1), 57–81.

Danis, W. M., De Clercq, D., & Petricevic, O. (2011). Are social networks more important for new business development in emerging than developed markets? An empirical test. *International Business Review, 20*(4), 394–408.

Fernhaber., S. A., McDougall, P. P., & Oviatt, B. M. (2007). Exploring the role of industry structure in new venture internationalization. *Entrepreneurship Theory and Practice, 31*(4), 517–542.

Gabrielsson, M., & Kirpalani, V. H. (2004). Born globals: How to reach new business space rapidly. *International Business Review, 13*, 555–571.

Gabrielsson, M., & Pelkonen, T. (2008). Born internationals: Market expansion and business operation mode strategies in the digital media field. *Journal of International Entrepreneurship, 6*(2), 49–71.

Gabrielsson, M., Sasi, V., & Darling, J. (2004). Finance strategies of rapidly growing Finnish SMEs: Born internationals and born globals. *European Business Review, 16*(6), 590–604.

Gabrielsson, M., Kirpalani, V. H., Dimitratos, P., Solberg, C. A., & Zucchella, A. (2008). Born globals: Propositions to help advance the theory. *International Business Review, 17*, 385–401.

Jantunen, A., Nummela, N., Puumalainen, K., & Saarenketo, S. (2008). Strategic orientations of born globals-do they really matter? *Journal of World Business, 43*, 158–170.

Johanson, J., & Vahlne, J. E. (1977). The internationalization process of the firm: A model of knowledge development and increasing foreign market commitment. *Journal of International Business Studies, 8*(1), 23–32.

Johanson, J., & Wiedersheim-Paul, F. (1975). The internationalization of the firms. Four Swedish Cases. *Journal of Management Studies, 12*(3), 305–322.

Johnson, J. E. (2004). Factors influencing the early internationalization of high-technology start-ups: US and UK evidence. *Journal of International Entrepreneurship, 2*, 139–154.

Jones, M. V. (1999). The internationalization of small UK high technology based firms. *Journal of International Marketing, 7*, 15–41.

Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International Entrepreneurship research (1989–2009): A domain ontology and thematic analysis. *Journal of Business Venturing, 26*, 632–659.

Keupp, M. M., & Gassmann, O. (2009). The past and the future of international entrepreneurship: A review and suggestions for developing the field. *Journal of Management, 35*(3), 600–633.

Kiss, A. N., Danis, W. M., & Cavusgil, S. T. (2012). International entrepreneurship research in emerging economies: A critical review and research agenda. *Journal of Business Venturing, 27*, 266–290.

Knight, G., & Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing, 8*, 11–26.

Knight, G., & Cavusgil, S. T. (2004). Innovation, organizational capabilities and the born-global firm. *Journal of International Business Studies, 35*(2), 124–141.

Knight, G., & Cavusgil, S. T. (2005). A taxonomy of born-global firms. *Management International Review, 45*(3), 15–35.

Kuivalainen, O., Sundqvist, S., & Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business, 42*(3), 253–267.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113–1155.

Laanti, R., Gabrielsson, M., & Gabrielsson, P. (2007). The globalization strategies of business-to-business born global firms in the wireless technology industry. *Industrial Marketing Management, 36*(8), 1104–1117.

Loane, S., Bell, J., & McNaughton, R. (2007). A cross-national study on the impact of management teams on the rapid internationalization of small firms. *Journal of World Business, 42*(4), 489–504.

Lopez, L. E., Kundu, S. K., & Ciravegna, L. (2009). Born global or born regional? Evidence from an exploratory study in the Costa Rican software industry. *Journal of International Business Studies, 40*(7), 1228–1238.

Madsen, T. K., & Servais, P. (1997). The internationalization of born globals: An evolutionary process? *International Business Review, 6*(6), 561–583.

Maskus, K. E., & Penubarti, M. (1995). How trade-related are intellectual property rights? *Journal of International Economics, 39*, 227–248.

Mathews, J. A., & Zander, I. (2007). The international entrepreneurial dynamics of accelerated internationalization. *Journal of International Business Studies, 38*(3), 387–403.

Moen, O. (2002). The born globals: A new generation of small European exporters. *International Marketing Review, 19*(2), 156–175.

Oviatt, B. M., & McDougall, P. P. (1994). Toward a theory of international new ventures. *Journal of International Business Studies, 25*(1), 45–64.

Oviatt, B. M., & McDougall, P. P. (1995). Global start-ups: Entrepreneurs on a worldwide stage. *Academy of Management Executive, 9*(2), 30–44.

Oviatt, B. M., & McDougall, P. P. (1997). Challenges for internationalization process theory: The case of international new ventures. *Management International Review, 37*(2), 85–99.

Oviatt, B. M., & McDougall, P. P. (2005). Defining international entrepreneurship and modeling the speed of internationalization. *Entrepreneurship Theory & Practice, 29*(5), 537–553.

Rennie, M. (1993). Global competitiveness: born global. *McKinsey Quarterly, 4*, 45–52.

Ruzzier, M., Antoncic, B., Hisrich, R. D., & Konecnik, M. (2007). Human capital and SME internationalization: A structural equation modeling study. *Canadian Journal of Administrative Sciences, 24*, 15–29.

Schwens, C., & Kabst, R. (2009). Early internationalization: A transaction cost economics and structural embeddedness perspective. *Journal of International Entrepreneurship, 7*, 323–340.

Sharma, D. D., & Blomstermo, A. (2003). The International process of born globals: A network view. *International Business Review, 12*, 739–753.

TechTarget's IT encyclopaedia, http://searchdatacenter.techtarget.com/

Vissak, T., Zhang, X., & Ukrainski, K. (2012). Successful born globals without experiential market knowledge: Survey evidence from China. In M. Gabrielsson & V. H. M. Kirpalani (Eds.), *Handbook of Research on born globals* (pp. 353–379). Cheltenham (UK): Edward Elgar Publishing.

Westhead, P., Wright, M., & Ucbasaran, D. (2001). The internationalization of new and small firms: A resource-based view. *Journal of Business Venturing, 16*, 333–358.

Zucchella, A., Palamara, G., & Denicolai, S. (2007). The drivers of the early internationalization of the firm. *Journal of World Business, 42*(3), 268–280.

Internationalization flows of high-tech start-ups: a gravity model

Abstract [The paper examines the locational determinants of the internationalization flows of high-tech start-ups. It also provides a picture of the current patterns of internationalization of high-tech start-ups, through a map of the most attractive countries in terms of inbound and outbound internationalization flows. The empirical data have been obtained from a cross-country survey on internationalized high-tech start-ups operating in the ICT and electronics sectors. Results highlight that US, UK and China are the most competitive countries in terms of inbound flows. We obtain evidence that internationalization flows of high-tech start-ups are motivated by the sourcing of host-country locational advantages, identified by the strength of the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of IPR protection.]

1. Introduction

In recent years, entrepreneurship has become a topic of major interest for policy makers, as it increasingly contributes to a country's innovation and economic growth. In several countries policy makers have paid special attention to innovative start-ups, characterized by a high technology content and a significant growth potential and have implemented a wide array of financial, economic and legal interventions tailored to the specific economic contexts (Buzzacchi, Scellato, & Ughetto, 2013; Cannone & Ughetto, 2013; Wallsten, 2000; Irwin & Klenow, 1996). The rationales often advocated for these policies have been: 1) to influence domestic entrepreneurs' incentives and payoffs to create new technology based firms, thus setting the ground for new high-tech industries in the country 2) to attract innovative firms from other countries in order to strengthen the country's extant high-tech sectors.

Setting the conditions to make a country attractive to internationally oriented small firms is a critical issue for host countries, because firms' internationalization flows are conditioned by a complex mix of out-selection factors which can constrain or boost firms' preferences for international operations. Out-selection factors are both associated with the host country conditions (such as the general state of the economy, the legal framework, the presence of incentive policies, the cultural background, the strength of bilateral political relationships, of bilateral trade agreements, of internal networks…) and with global dynamics and challenges (such as changes in currency values, stock market conditions, unnatural or natural events …).

These issues are particularly relevant today, given that the increased openness of economies, the emergence of global players, the firms' need for new sources of competitiveness and the technological advances in communication, information and transportation which have drastically reduced internationalization costs, have been reshaping the business environment of firms. In this context, young technology based firms increasingly conceive internationalization as a process embedded in their overall growth path, no longer limited to sales activities, as theorized in the traditional internationalization models (Johanson & Vahlne, 1977), but also to R&D and innovation activities (Granstrand, Håkanson, & Sjölander 1993; Brockhoff, 1998). In addition, several innovative start-ups tend to adopt a global market vision from the outset and embark on rapid and dedicated internationalization through exportation or any other entry mode (the so called *born globals*, Knight & Cavusgil, 1996).

In recent years, the international business literature has offered insights on the internationalization dynamics of firms from two main perspectives. One main strand of research has focused on macro-economic analyses of bilateral foreign direct investment or export flows (Buckley, Clegg, Cross, Liu, Voss, & Zheng, 2007; Grosse & Trevino, 1996). Research in this area has examined the factors affecting the extent of trade between countries, looking at economic, cultural, political and juridical differences between host and home countries (Braunerhjelm & Svensson, 1996). The international operations of large multinational firms have been the main focus of such analyses. Instead, little is known about which factors enable a host country to be attractive for high-tech start-ups and which are the most attractive countries for such companies.

Another strand of literature has investigated the modes and determinants characterizing the internationalization process of young and small firms. Under the assumption that this latter is substantially different from the one concerning multinational enterprises (Dimitratos & Jones 2005), this literature has examined the modes of entry, the timing (in relation to the development stage of the firm) and the scope of the international expansion of small firms. These papers have mainly focused on one particular country (Chetty & Campbell-Hunt, 2004; Kuivalainen, Sundqvist, & Servais, 2007;

Zucchella, Palamara, & Denicolai, 2007), while the few attempts made to compare different experiences in several countries have mainly been of a qualitative nature (Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008; Gabrielsson & Pelkonen, 2008). Cross-country quantitative survey research in this field of study is somewhat scant and limited by small sample sizes.

This paper adds to the international business literature in two ways. First, it provides a picture of the current patterns of internationalization for high-tech start-ups, through a map of the most attractive countries in terms of inbound and outbound internationalization flows. Second, this research is an empirical attempt to understand the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries. In particular, the paper examines whether internationalization flows of high-tech start-ups are motivated by the sourcing of the host-country locational advantages (such as the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of protection of intellectual property rights), controlling for the host country competitive conditions, market size, similarity of socio-cultural environment and distance from the home country. To date, we are not aware of any other study that has examined to what extent the internationalization flows of high-tech start-ups are affected by host country conditions in a cross-country context.

In order to address these issues, a sample of 429 firms, represented by respondents to a questionnaire survey conducted over the December 2011 to February 2012 period, has been analyzed. The surveyed firms are internationalized high-tech start-ups operating in the ICT and electronics sectors, located in different countries throughout the world. Information on internationalization trajectories has been complemented by country-level data on host/home countries.

Results highlight that US, UK and China are the most competitive countries in terms of inbound flows of high-tech start-ups. We obtain evidence that countries characterized by a high degree of investors protection, IPR protection and innovation capacity tend to attract a larger number of high-tech start-ups. The cost of contract enforcement in the host country has a negative explanatory power on the intensity of internationalization flows. Finally, another major driver that influences the

attractiveness of host countries for high-tech start-ups is the availability of venture capital (VC) financing.

The remainder of this paper is organized as follows. Section 2 puts forward some testable hypotheses in the context of prior research. Section 3 describes the dataset and presents the descriptive statistics. Section 4 introduces the gravity model and discusses the results. Section 5 concludes and summarizes the paper.

2. Hypotheses

In this section, we formulate a set of hypotheses regarding the association between internationalization flows of high-tech start-ups and the attractiveness of the host country. The theoretical foundation of the determinants that affect the location choice of a firm willing to internationalize its business goes back to the "eclectic paradigm" (also known as OLI model) developed by Dunning (1977).[1] Dunning (1977) suggests four major motives that drive foreign direct investments (FDI): market-seeking (e.g economy size), resource-seeking (e.g availability of natural resources), efficiency-seeking (e.g infrastructure quality) and strategic asset seeking (e.g availability of strategic assets). Although Dunning (1977)'s model applies only to FDI, it can provide some useful insights to interpret the location decisions of firms that internationalize through different entry modes. The model has been also employed to explain the internationalization of innovation activities by technology based firms (see Granstrand, Håkanson & Sjölander, 1993).

In this paper we concentrate only on host country endownments that make it attractive for foreign firms to operate in the host country. We consider several dimensions that characterize the attractiveness of a host country environment: the legal and regulatory framework, the dimension of the VC industry, the innovation capacity and the degree of intellectual property rights (IPR) protection.

[1] The "eclectic paradigm" developed by Dunning (1977) combines ownership-specific (O), location-specific (L) and internalization (I) advantages. Ownership advantages are firm-specific competitive advantages, resources or capabilities, location advantages refer to the specific institutional and economic endowments of host countries, internalization advantages refer to the firm's ability to manage and coordinate foreign business activities.

The legal and regulatory framework of a host country can heavily influence the easiness of starting and operating a business in that country. This is particularly important for small firms, which are endowed with limited financial resources and which face a harsh competition with larger and more experienced firms. Poorly designed business regulations, combined with weak legal institutions that protect property and investor rights, can become obstacles to doing business and more generally constrain economic growth and trade performance. A large body of evidence suggests that policy makers interested to attract FDI in their country need to pay attention to the quality of business regulations, laws, institutional arrangements and to their enforcement (Alesina, Ardagna, Nicoletti, & Schiantarelli, 2005; Antunes & Cavalcanti, 2007; Freund & Bolaky, 2008; Barseghyan, 2008; Klapper, Lewin & Quesada Delgado, 2009; Naudè & Krugell, 2007). A business-friendly environment is more likely to attract the activities of foreign companies, because it creates the incentives to create jobs, to innovate and to increase productivity (Antunes & Cavalcanti, 2007; Klapper, Lewin, & Quesada Delgado, 2009; Hornberger, Battat, & Kusek, 2011; Busse & Groizard, 2008).

A favorable environment to set up a business is characterized by an adequate level of investors protection and by a limited cost of enforcing contracts. Countries that can best create a welcoming environment for investors, in terms of protection and contracts enforcement, can attract greater and more competitive inflows of foreign companies. The strength of shareholder protection has been widely recognized to matter for companies, because it determines investor confidence in markets, makes investment in firms to be less sensitive to financial constraints and leads to greater growth in revenues and profitability (Mclean, Zhang, & Zhao 2012; Shleifer & Wolfenzon, 2002; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). High-tech start-ups, which are characterized by a low internal financial availability, often rely on external investors in order to acquire the capital necessary for their growth. These external investors, typically venture capitalists, are very concerned to preserve their investments from potential unfavorable rules which might apply in a different country. A judicial system that provides timely and cheap procedures to resolve commercial disputes is crucial to attract

the interest of foreign investors. In particular, it has been found that FDI are greater where the cost of contract enforcement is lower (Ahlquist & Prakash, A, 2010).

This line of arguments on the strength of the legal and regulatory framework in the host country leads to the following two testable hypotheses:

HP 1. The extent of shareholder protection in a host country is positively related to the intensity of internationalization flows of high-tech start-ups towards that country.

HP 2. The cost of contract enforcement in a host country is negatively related to the intensity of internationalization flows of high-tech start-ups towards that country.

Venture capital has traditionally been advocated to play a critical role for high-tech start-ups that find it difficult to access capital markets to fund their operations, finance their investment opportunities and sustain their growth. Financial constraints are particularly acute for innovative entrepreneurial firms because their investment returns are uncertain, they have little collateral to secure debt and they are subject to higher informational frictions (Carpenter & Petersen, 2002; Hall, 2002). A start-up might be interested in the presence of VC funds in target markets for two main reasons. First, start-ups that have not yet raised VC money in their home market might decide to move to other countries where there are more opportunities to secure VC investments in order to scale their businesses. Second, more mature start-ups could look for additional funding that the domestic VC market is not able or willing to provide. The evidence that more available venture capital allows for an increase in successful entrepreneurial activity (Kortum & Lerner, 2000; Bottazzi & Da Rin, 2002) has led many governments worldwide to implement programs to mobilize venture capital (Buzzacchi, Scellato, & Ughetto, 2013). Founders of start-ups that want to internationalize will certainly consider moving into a country characterized by a greater availability of venture capital funding. Accordingly, we posit that:

HP3. A greater availability of venture capital financing in the host country is positively related to the intensity of internationalization flows of high-tech start-ups towards that country.

A host country's innovative capacity can form another important motivation driving the internationalization flows of technology-intensive start-ups. This capacity reflects the conditions,

investments, and policy choices that create the environment for innovation (e.g. the presence of strategic assets such as research centers and laboratories, skilled R&D personnel, high-quality universities, brands and technology...). The literature has identified two basic motives that drive technology-based firms' decisions to target countries characterized by innovative capacity (Kuemmerle, 1999; Le Bas & Sierra, 2002; von Zedtwitz & Gassmann, 2002). First, according to the "asset exploiting" arguments, firms are interested in promoting the use of their technological assets/products in markets that are receptive to innovation and technological advances. Indeed, the responsiveness of customers to innovations is an important element of location attractiveness. Obviously, some level of modification to the company's products or processes may be required in response to local demand conditions (Dachs & Pyka, 2010; Criscuolo, Narula, & Verspagen, 2005). Second, an "asset augmenting" strategy is followed when the innovation system of the foreign location allows firms to absorb and acquire technological capacities, spillovers, or other location-specific technological advantages that are not available at home (Dunning & Narula, 1995; Kuemmerle, 1999). According to this view, establishing a presence abroad responds to the firm's need to augment its existing stock of knowledge by seeking advantageous locations where complementary competencies are available. These arguments lead to the following hypothesis:

HP4. A host country's innovative capacity is positively related to the intensity of internationalization flows of high-tech start-ups towards that country.

Intellectual property rights protection has a decisive influence on the internationalization trajectory of high-tech firms. If firms engage in R&D and innovation activities in the host country (even if by simply adapting existing products to the local market), the results of these activities may only be protected at the host country patent office (Dachs & Pyka, 2010). IPR protection is relevant for all manufacturing sectors, and increasingly for information technology sectors, whose investments are also sensitive to property rights risks (Jandhyala, 2012). It follows that strong IPR protection should attract foreign direct investments, large volumes of licensed technology and favor international

technological collaborations, since it limits the possibility of the threat of imitation (Maskus & Penubarti, 1995). We thus advance the following hypothesis:

HP5. Strong IPR protection is positively related to the intensity of internationalization flows of high-tech start-ups towards that country.

3. Sample characteristics and descriptive statistics

3.1 Data sources

The data used for the study include information collected both at firm and country level. Data concerning the internationalization path of sample firms have been obtained from a survey conducted over the December 2011 to February 2012 period on internationalized high-tech start-ups operating in the ICT and electronics sectors and located in different countries throughout the world. Survey data have been employed in a companion paper by Cannone and Ughetto (2012). The basic data and e-mail contacts for the surveyed companies have been extracted in October 2011 from CrunchBase[2], a free high technology company and investor database with global geographical focus.

We selected companies operating in the following sub-fields (according to the CrunchBase definition): advertising, e-commerce, enterprise, games and video, mobile, network hosting, search, security and software. This resulted in a sample of 38,585 start-up companies located worldwide. Firms with missing information on e-mail addresses were excluded and the sample was restricted to only internationalized firms, leading the sample to be reduced to 2,604 companies.

Questionnaires were sent out electronically over the December 2011 to February 2012 period. A follow-up was undertaken by sending reminders to those who had not responded after 6 weeks from the first mailing. The respondents were assured confidentiality. A total of 522 responses were gathered, yielding an effective response rate of about 20%. Non-response bias was checked on a number of

[2] CrunchBase is operated by TechCrunch, which is located in the Silicon Valley (California), and is one of the most popular Internet blogs on technological innovations. The dataset is quite new and it shows a good potential for research purposes. The dataset can be found at http://www.crunchbase.com/.

variables based on the notion that late respondents would be more like non respondents than earlier respondents (Armstrong & Overton, 1977). The results showed that the non response bias was minimal, with respect to all the questionnaire items.

Firms were asked to report the country in which they first internationalized. Observations with missing values in this variable were dropped, and the sample was thus reduced to 429 companies, targeting a total of 76 countries. For each country of destination we gathered information on some macro indicators such as GDP, stock of patent applications, foreign direct investments, exports, size of the VC industry, strength of the legal and regulatory framework and strength of IPR protection. We also collected data on different distance measures connecting home and host countries. We used several data sources: the CEPII database, the World Economic Outlook database (IMF), the Unctadstat database (UNCTAD), Thomson Innovation, Venture Source, the Doing Business report (World Bank) and the International Trade Statistics report (WTO).

3.2 Summary statistics

Out of 429 firms, 34.83% operate in the software sector, 25.84% in the web sector and 10.79% in the mobile sector. These firms are mainly based in Europe and North America (48.48% and 30.07% respectively). Firms located in Asia are 14.22%, followed by Central and South America (4.20%) and Africa and Oceania (3.03%). The sample covers a total of 76 countries.

Internationalization flows of sample firms are directed mainly towards North America. Indeed, internationalization flows to North America represent 40.79% of the total inbound flows, followed by Europe (38.23%), Asia (12.59%), Central and South America (4.20%), Oceania (3.50%) and Africa (0.70%). Table 1 reports the outbound and inbound internationalization flows for the top ten countries in terms of flow size. The size of the outbound flow for a country is given by the number of firms founded in that country that internationalize to other countries. The size of the inbound flow for a country indicates the number of firms which have chosen that particular country as the first country in which to internationalize. As Table 1 shows, the US ranks first for both outbound and inbound flows.

While being the country in which most of sample companies have headquarters, the US seems to be the most attractive destination for companies founded in other countries. A similar situation characterize the UK. China does not show a high volume of outbound flows, while being characterized by significant inbound flows. This means that although the number of Chinese companies which internationalize is relatively low, the country seems to be an attractive destination for companies located in other countries.

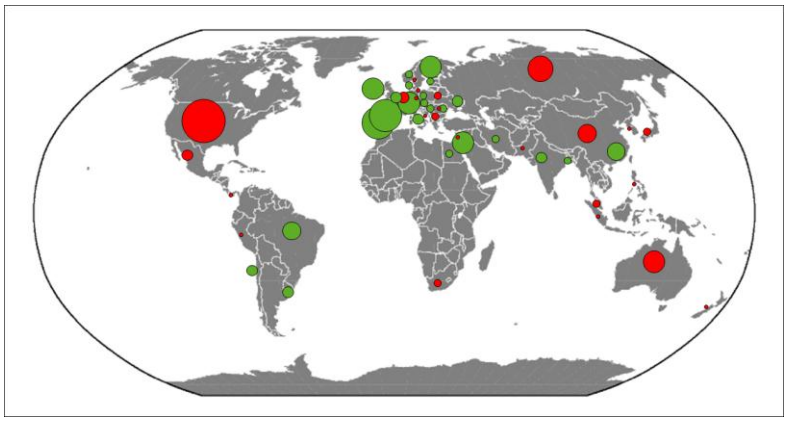
Table 1. Top ten countries for outbound and inbound internationalization flows

	Outbound flows			Inbound flows		
Rank	**Country**	**Flow size**	**%**	**Country**	**Flow Size**	**%**
1	USA	98	22.84%	USA	152	35.43%
2	United Kingdom	49	11.42%	United Kingdom	65	15.15%
3	Canada	23	5.36%	Canada	23	5.36%
4	Spain	23	5.36%	India	16	3.73%
5	France	20	4.66%	Australia	12	2.80%
6	India	19	4.43%	China	12	2.80%
7	Italy	13	3.03%	Germany	12	2.80%
8	Israel	12	2.80%	Netherlands	12	2.80%
9	Switzerland	12	2.80%	Italy	10	2.33%
10	Germany	11	2.56%	Argentina	9	2.10%

Note: The Table reports the outbound and inbound internationalization flows for the top ten countries in terms of flow size. The size of the outbound flow for a country is given by the number of firms founded in that country that internationalize to other countries. The size of the inbound flow for a country indicates the number of firms which have chosen that particular country as the first country in which to internationalize.

The geography of net flows is illustrated in Figure 1. Net flows are defined as the difference between the inbound and the outbound flows and can be either positive or negative. The green circles indicate countries characterized by negative net flows, while the red circles identify countries with positive net flows. The diameter of the circle represents the size of the net flows. The US is characterized by the highest positive net flows (54), followed by United Kingdom (16), China (9) and Australia (6). The map shows that Europe is characterized by a large number of countries showing large negative net flows; the country with the highest negative net flows is Spain (14), followed by France (12), Switzerland (9) and Israel (9). The presence of significant negative net flows characterizes South America as well, even if the extent of the phenomenon appears to be more limited.

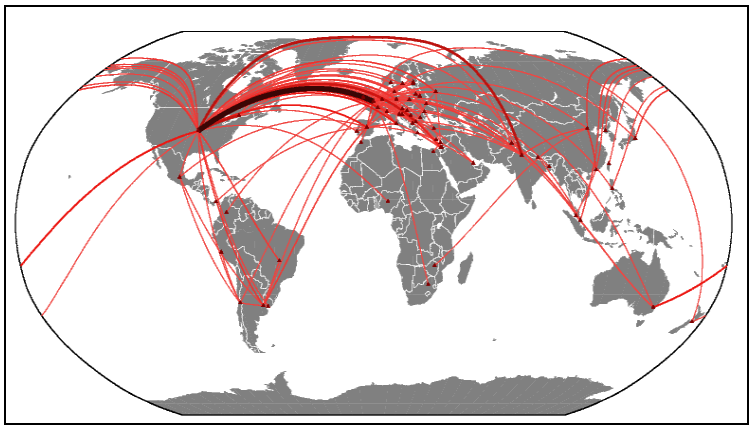
Figure 1. Positive and negative net flows



Note: Net flows are defined as the difference between the inbound and the outbound flows and can be either positive or negative. The green circles indicate countries characterized by negative net flows, while the red circles identify countries with positive net flows. The diameter of the circle represents the size of the net flows.

Figure 2 depicts the linkages in terms of bilateral flows that exist among analyzed countries. The size of the link between an hypothetical country A and a country B is given by the number of firms which have internationalized from country A to country B or viceversa. Stronger links are associated with thicker lines. It is possible to observe the presence of strong linkages between countries which are known to have consolidated trade relationships. For example, if we consider the US which ranks first in terms of bilateral flows, it emerges that the US and the UK account for a total of 48 bilateral linkages, followed by US and India (21) and US and Canada (19).

Figure 2. Bilateral internationalization flows



Note: The size of the link between an hypothetical country A and a country B is given by the number of firms which have internationalized from country A to country B or viceversa. Stronger links are associated with thicker lines.

4. Empirical analysis

4.1 The gravity model

In order to explore the determinants of the intensity of internationalization flows of high-tech start-ups between pair of countries we adopt a modified gravity model. The gravity model has been largely employed to explain bilateral trade flows (see De Benedictis & Taglioni, 2011 for a review), as increasing in their economic size and decreasing in their distance[3].

The dependent variable of the gravity model is the intensity of the internationalization flow from country *i* to country *j* (FLOW_INTENSITY), measured by the number of firms established in country *i* which choose to enter country *j* as a first country of entry. Internationalization flows between pairs of countries are assumed to depend upon a set of destination-specific variables that affect the attractiveness of country *j*, distance measures and bilateral "linkages" between the two countries. A listing of the variables used in the empirical analysis along with their definitions and data source is provided in Table 2.

Table 2. Definition of variables used in the empirical analysis

Dependent Variable	
$FLOW\ INTENSITY_{ij}$	Number of firms established in country *i* which choose to enter country *j* as a first country of entry.
Independent Variables	
GDP_i	GDP of country *i* in 2011 (logarithm). Source: World Economic Outlook, IMF.
GDP_j	GDP of country *j* in 2011 (logarithm). Source: World Economic Outlook, IMF.
$PATENTS_i$	Total number of patent applications in country *i* until the year 2011 (logarithm). Source: Thomson Innovation database, Thomson Reuters.
$PATENTS_j$	Total number of patent applications in country *j* until the year 2011 (logarithm). Source: Thomson Innovation database, Thomson Reuters.
$DIST_{ij}$	The variable refers to the latitude and longitude of the most populated cities. Source: CEPII database.
$DIST\_CAPITAL_{ij}$	The variable refers to the latitude and longitude of capital cities. Source: CEPII database.
$DIST\_WEIGHTED_{ij}$	The variable is a weighted (by the share of country population) measure of the distances of the most populated cities. Source:

[3] Gravity equations have been applied to explain other types of relationships between countries, such as trade in services (Ceglowski, 2006), knowledge flows through patent citations (Peri, 2005), internationalization of inventive activities (Picci, 2010) and immigration flows (Lewer & Van den Berg, 2008).

	CEPII database.
TIME ZONE$_{ij}$	Time difference in hours between the capital cities of countries *i* and *j*. This variable ranges from 0 to 12. Source: CEPII database.
COMMON LANG (0,1)	Dummy variable which takes value 1 if country *i* and country *j* share the same language. Source: CEPII database.
COLONY (0,1)	Dummy variable which takes value 1 if country *i* and country *j* have ever had a colonial relationship. Source: CEPII database.
COMMON LEGAL (0,1)	Dummy variable which takes value 1 if country *i* and country *j* share the same legal origin. Source: CEPII database.
IPR PROTECTION$_j$	The Index of Patent Rights Park (2008) for country *j* ranges from 0 to 5. It is the un-weighted sum of the figures for five different aspects of protection of patent rights (extent of coverage, membership of international treaties, duration of protection, absence of restrictions on rights and statutory enforcement provisions). Source: Park, 2008.
INVESTOR PROTECTION$_j$	The investor protection index for country *j* ranges from 0 to 10, with higher values indicating more investor protection. The index considers the transparency of related-party transactions, the liability for self-dealing and the shareholders' ability to sue officers and directors for misconduct. Source: Doing Business Report 2013, World Bank.
COST ENFORCEMENT$_j$	Average costs (court costs, enforcement costs, attorney fees) involved in resolving a commercial dispute in country *j*. Source: Doing Business Report 2013, World Bank.
VC AMOUNT$_j$	Amount of capital invested in VC deals in country *j* in year 2011 (logarithm). Source: Venture Source, Down Jones.
COST EXPORT$_i$	Average cost to complete the procedures to export the goods for country *i* (logarithm). The cost includes costs for documents, administrative fees for customs clearance and inspections, customs broker fees, port-related charges and inland transport costs. Source: Doing Business Report 2013, World Bank.
FDI$_j$	FDI stock for country *j* in year 2011 (logarithm). Source: Unctadstat database, UNCTAD
EXPORT$_j$	Total exports for country *j* in year 2011 (logarithm). Source: International Trade Statistics report, WTO

Distance effects are estimated as a parameter in the gravity equation. The model incorporates geographical as well as cultural distance between host and home country as explanatory variables. We consider four different measures of geographical distance: DIST refers to the latitude and longitude of the most populated cities, DIST_CAPITAL refers to the latitude and longitude of capital cities, DIST_WEIGHTED is a weighted (by the share of country population) measure of the distances of the most populated cities. In order to account for the importance of differences in time zones in affecting business transactions (Stein & Duade, 2007), we also include the variable TIME ZONE, which measures the time difference in hours between the capital cities of countries *i* and *j*. This variable ranges from 0 to 12.

While most of scholarly works have found a persistence negative effect of distance on bilateral trade flows[4], it is quite likely that this effect is not fully explained by transportation costs alone. It could well be that what really matters is a broad concept of distance, which also includes socio-cultural distance. The similarity of the socio-cultural environment between two countries has been identified to be a critical dimension in explaining trade flows; it can have a profound impact on market access, on consumption patterns and on how business is conducted (Kogut & Singh, 1988; Fletcher & Bohn, 1988). We account for the role of socio-cultural distance by using a vector of linkage variables identifying country pairs with a common language (COMMON LANG), a common legal origin (COMMON LEGAL) and a past colonial link (COLONY).

To validate H1 and H2 we include in the model two variables capturing the strength of the legal and regulatory framework in the host country: the investors protection index, which measures the strength of shareholder protections against directors' misuse of corporate assets (INVESTOR PROTECTION) and the cost of contract enforcement (COST ENFORCEMENT), which measures the costs (court costs, enforcement costs, attorney fees) involved in resolving a commercial dispute. H3 is tested using the amount of capital invested in VC deals in country *j* in year 2011 (VC AMOUNT), while the innovation capacity of the host country (H4) is proxied by the total number of patent applications till the year 2011, extracted from Thomson Innovation database through a search of kind codes. The model specification also controls for patent applications in the home country. We assess the degree of protection of IPR (H5) by employing the Index of Patent Rights provided by Park (2008). This index ranges from 0 to 5 and is the un-weighted sum of the figures for five different aspects of protection of patent rights (extent of coverage, membership of international treaties, duration of protection, absence of restrictions on rights and statutory enforcement provisions).

We substitute the masses of the law of gravity in the gravity model with the market size for country *i* and *j*, measured by the level of GDP. The size of the target market is generally regarded as a main

[4] Performing a meta-analysis on 103 papers applying the gravity model, Disdier and Head (2008) show that distance negatively influences bilateral trade flows. The authors thus challenge the idea that distance is becoming less relevant with globalization and with advances in information and communication technologies.

driver of the decision of firms to start operating in a foreign country. Large foreign markets allow firms to realize economies of scale in production/sales and offer a greater potential for growth and profit. Since large markets tend to attract global competition, firms that are excluded from these markets are competitively disadvantaged (Porter, 1980). Moreover, firms can use larger markets as a base to export to smaller markets in the region (Krugman, 1980). It has been generally found a positive relationship between investment attraction and the market size/potential of the host country (Blonigen & Piger, 2011; Buckley, Clegg, Cross, Liu, Voss, & Zheng, 2007; De Beule & Duanmu, 2012).

Finally, a set of control variables are included in the model. We take into account the average cost to export for the home country, because a high cost to complete the procedures to export might hinder the international orientation of a financially constrained start-up (COST EXPORT). We also check for the competitive conditions in the host country environment looking at the total amount of foreign direct investments (FDI) and of exports (EXPORT). We include country dummies (both for country *i* and *j*) in all specifications in order to control for unobservable differences between countries (e.g. macroeconomic and political stability).

4.2 Econometric results

Table 3 presents estimation results for the gravity model. The Table reports either OLS (Model 1 to 3) and Poisson estimates (Models 4 and 5). Santos Silva and Tenreyro (2006) show that in the presence of heteroskedasticity, the OLS estimator can provide inconsistent estimates. To address this problem, they recommend a Poisson pseudo maximum likelihood estimator as a robust alternative. The Poisson regressions yield similar results than the benchmark OLS estimates, with very few exceptions.

Results confirm that the geographic distance between two countries is negatively correlated with the intensity of internationalization flows between them. This effect, which holds in all model specifications, is in line with the general evidence that distance still matters, despite developments in transportation and information and communication technology have led to an increasingly integrated, less distant world (Brock, Johnson, & Yu Zhou, 2011). The socio-cultural distance between pairs of

countries is instead proxied by the linkage variables. We find that sharing a common legal framework and having a past colonial relationship positively influence the intensity of internationalization flows from the home country to the host country, while sharing a common language does not display a significant effect.

Models 3 and 5 of Table 3 test the hypotheses described in Section 2. We control for the competitive conditions in the host country (FDI and exports) and for the cost to export in the home country. Some interesting findings emerge when considering the dimensions related to the strength of the legal and regulatory framework in the host country. Countries characterized by a high degree of investors protection tend to attract a larger number of foreign companies. The effect is positive and significant in all model specifications at the 10% level of statistical significance. The cost of contract enforcement in the host country has a negative, although weekly significant, explanatory power on the intensity of internationalization flows. The variable loses statistical significance in the Poisson specification.

The variables related to the strength of IPR protection and the innovation capacity in the host country are positive and significant at 10% and 1% levels, respectively. Entrepreneurs do not seem to be interested in moving to countries characterized by low levels of innovation capacity or IPR protection, which could prevent them from either acquiring technological capacities or other location-specific technological advantages and appropriating the value generated from their investment in innovation. Finally, a significant and positive effect on the intensity of internationalization flows between pairs of countries is observed for the amount of VC financing, thus confirming HP3.

To test the robustness of the results we have also run the model using alternative geographical distance measures (see Table 1A in the Appendix). The distance effect persists if distance is measured in terms of latitude and longitude of capital cities, while it loses statistical significance (even though negative as expected) if it is measured in terms of time zone or weighted distance (by the share of country population) of the most populated cities. Overall results hold when the three different distance measures are employed.

Table 3. Gravity model to test the factors influencing the internationalization flows of high-tech start-ups. OLS and Poisson estimates.

	OLS			POISSON	
VARIABLES	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)
GDP_i	-0.659***	-0.266	-0.432*	-0.026	-0.057**
	(0.193)	(0.196)	(0.230)	(0.027)	(0.028)
GDP_j	-0.261	0.261	-0.318	-0.004	-0.128***
	(0.205)	(0.237)	(0.260)	(0.030)	(0.035)
$PATENTS_i$	1.373***	1.295***	1.285***	0.184***	0.158***
	(0.166)	(0.191)	(0.208)	(0.018)	(0.021)
$PATENTS_j$	1.580***	1.452***	0.752**	0.269***	0.118***
	(0.187)	(0.209)	(0.350)	(0.026)	(0.038)
$DIST_{ij}$	-0.616**	-0.668**	-0.681*	-0.120***	-0.080*
	(0.270)	(0.308)	(0.365)	(0.028)	(0.044)
COMMON LANG		1.383	0.451	0.194	0.112
		(0.859)	(0.835)	(0.104)	(0.095)
COLONY		5.340***	4.829***	0.695***	0.546***
		(0.791)	(0.792)	(0.072)	(0.085)
COMMON LEGAL		5.989***	7.040***	0.629***	0.690***
		(0.897)	(0.916)	(0.088)	(0.087)
$IPR\ PROTECTION_j$			3.295**		0.499**
			(1.634)		(0.216)
$VC\ AMOUNT_j$			0.516**		0.101***
			(0.222)		(0.030)
$INVESTOR\ PROTECTION_j$			0.823**		0.117**
			(0.388)		(0.055)
$COST\ ENFORCEMENT_j$			-0.184*		-0.007
			(0.110)		(0.013)
$COST\ EXPORT_i$			-3.509**		-0.236*
			(1.672)		(0.144)
FDI_j			-1.622*		-0.245**
			(0.884)		(0.122)
$EXPORT_j$			0.796		0.183
			(0.867)		(0.117)
Country dummies i	yes	yes	yes	yes	yes
Country dummies j	yes	yes	yes	yes	yes
Constant	-13.875**	-24.952***	4.878	-3.309***	-1.313
	(5.963)	(5.991)	(16.445)	(0.803)	(1.986)
Observations	310	310	310	310	310
R-squared	0.444	0.734	0.796		
Pseudo R-squared				0.6039	0.6259

Note: The dependent variable is $FLOW\ INTENSITY_{ij}$. Standard errors are in parenthesis. Country dummies (*i* and *j*) are not reported to save space. ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

5. Concluding remarks

The paper contributes to the international business literature in two ways. First, it provides a comprehensive visualization of the current patterns of internationalization of high-tech start-ups. US, UK and China seem to be the most attractive countries for internationally oriented start-ups, whereas many European countries are not able to be as competitive. Second, the study examines the relationship between internationalization patterns of high-tech start-ups and attractiveness of host countries. Based on a database of 429 internationalized high-tech start-ups targeting 76 countries and operating in the ICT and electronics sectors, the paper finds that internationalization flows of high-tech start-ups are motivated by the sourcing of host-country locational advantages, identified by the strength of the legal and regulatory framework, the availability of venture capital financing, the innovation potential and the strength of IPR protection.

Our results have clear implications for policy makers. A deeper understanding of the conditions under which foreign innovative firms are likely to enter the domestic market is crucial for policy makers who intend to attract technology-based firms from all over the world. Currently, in most public policy agendas, the main objective is to foster the creation and growth of domestic entrepreneurship, whereas less efforts are directed towards attracting foreign entrepreneurs and start-ups. The extent of the diffusion of internationalized high-tech start-ups largely depends upon whether enabling conditions are in place. The pace at which small high-tech firms expand internationally might be constrained by the absence or limited presence of adequate policies in hosting countries. This situation calls for new challenges to policy makers that have to introduce appropriate regulations/incentive schemes or simply to adapt extant regulations to new demands from the market and to changes in technology.

The overall picture obtained from the empirical analysis has highlighted that high-tech start-ups are attracted by those countries able to provide a legal and regulatory framework which guarantees a high level of trust and confidence to new entrants. Indeed, an adequate level of investors protection and the presence of lean procedures to resolve commercial disputes are found to provide foreign investors a safer environment to invest in. In addition, a strong protection of intellectual property rights in the host

country increases the confidence of foreign innovators, who are less concerned with the possibility that competitors appropriate the value generated from their investments in innovation.

Other major drivers that influence the attractiveness of a host country for high-tech start-ups are the availability of venture capital financing and the level of a country's innovation capacity. The evidence of the positive role played by venture capital in strengthening the entrepreneurial activity in a country, has led many governments to mobilize venture capital and to sustain public/private VC partnerships. Investments in R&D are extremely relevant because a dynamic and advanced innovation system allows not only for the creation of domestic high-tech companies, but also for the attraction of innovative companies from other countries.

To conclude, policy makers aiming at creating a favorable environment for internationally oriented high-tech start-ups should consider three main guidelines in their agendas: 1) creating a clear legal and regulatory environment to provide foreign investors trust and confidence in the host market; 2) mobilizing private capital to fuel into VC funds, in order to match the internal demand but also to attract the foreign demand; 3) investing in R&D in order to increase the country's innovation capacity to attract foreign technology-based companies.

Valuable insights could be derived from a close examination of the distinctive contexts and of the related policies that have to be implemented to facilitate the attraction of high-tech start-ups. In this sense, a cross-country comparison of the instruments, programs and laws that are actually in place or an examination of the effects that more or less restrictive policies might have on the direction of internationalization flows is rich in potential for future research.

There are some clear limitations in the present work which indicate the necessity of future research. A first limitation concerns the country level focus of the analysis. Countries may present a significant variability within regions or cities of the conditions to attract high-tech start-ups. The concentration of top-level universities, networks of entrepreneurs, technology or VC investors in a particular area, and the presence of specific regulations at regional or city level, could push high-tech start-ups towards a

particular area of the country. Narrowing the focus of the analysis to the regional/city levels will open an avenue for future research.

A second limitation concerns the choice of the dimensions explored in our analysis, which might be incomplete. Future research could extend the exploration of the determinants that affect the intensity of the internationalization flows of high-tech start-ups by including further elements. The industry structure, the competitive arena, the state of the distribution channels in the host country are assumed to account for many of the variations in internationalization patterns but remain issues that deserve further exploration.

Another limitation of the study is its cross-sectional nature. Longitudinal studies might shed further light on firms' internationalization patterns and trajectories. In that sense, events that took place in different periods of time in each of the countries studied could be controlled for. Finally, sector differences within high-tech start-ups have not been considered. Due to the small sample size we could not carry out more detailed analyses based on a disaggregated technological breakdown of surveyed companies. Richer insights could be achieved by examining specific factors for each sector or even by extending the analysis to other high-tech sectors (e.g. biotech, pharmaceuticals, chemicals..).

References

Ahlquist, J.S., & Prakash, A. (2010). FDI and the costs of contract enforcement in developing countries. *Policy Sciences,* 43(2), 181‐200.

Alesina, A., Ardagna, S., Nicoletti, G., & Schiantarelli, F. (2005). Regulation and investment. *Journal of the European Economic Association,* 3(4), 791‐825.

Antunes, A., & Cavalcanti, T. (2007). Start up costs, limited enforcement, and the hidden economy. *European Economic Review,* 51(1), 203‐24.

Armstron, J.S., & Overton, T.S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research*, 14(3), 396-402.

Barseghyan, L. (2008). Entry costs and cross-country differences in productivity and output. *Journal of Economic Growth,* 13(2), 145‐67.

Blonigen, B., & Piger, J. (2011). Determinants of foreign direct investment. NBER Working Paper 16704, National Bureau of Economic Research, Cambridge, MA.

Bottazzi, L., & Da Rin, M. (2002). Venture capital in Europe and the financing of innovative companies. *Economic policy: A European forum*, 17(34), 229-27.

Braunerhjelm, P., & Svensson, R. (1996). Host country characteristics and agglomeration in foreign direct investment. *Applied Economics*, 28, 833- 840.

Brock, J.K., Johnson, J.E., & Yu Zhou, J. (2011). Does distance matter for internationally-oriented small firms? *Industrial Marketing Management*, 40, 384–394

Brockhoff, K. (1998). *Internationalization of research and development*. : Berlin, Heidelberg: Springer-Verlag.

Buckley, P., Clegg, J., Cross, A., Liu, X., Voss, H., & Zheng, P. (2007). The determinants of Chinese outward foreign direct investment. *Journal of International Business Studies*, 38(4), 499–518.

Busse, M., & Groizard, J.L. (2008). Foreign direct investment, regulations, and growth. *The World Economy,* 31(7), 861‐86.

Buzzacchi, L., Scellato, G., & Ughetto, E. (2013). The investment strategies of publicly sponsored venture capital funds. *Journal of Banking & Finance*, 37, 707–716.

Cannone, G., & Ughetto, E. (2012). Born globals: A cross-country survey on high-tech start-ups, re-vise and resubmit with minor revisions, *International Business Review*.

Cannone, G., & Ughetto, E. (2013). Funding innovation at regional level: An analysis of a public policy intervention in the Piedmont region. *Regional Studies*, forthcoming.

Carpenter, R., & Petersen, B. (2002). Capital market imperfections, high-tech investment and new equity financing. *Economic Journal,* 112, 54–72.

Ceglowski, J. (2006). Does gravity matter in a service economy? *Review of World Economics*, 142 (2), 307–329.

Chetty, S., & Campbell-Hunt, C. (2004). A strategic approach to internationalization: A traditional versus a "born global" approach. *Journal of International Marketing,* 12(1), 57-81.

Criscuolo, P., Narula, R., & Verspagen, B. (2005). Role of home and host country innovation systems in R&D internationalisation: a patent citation analysis. *Economics of Innovation and New Technology*, 14(5), 417–433.

Dachs, B., & Pyka, A. (2010). What drives the internationalisation of innovation? Evidence from European patent data. *Economics of Innovation and New Technology*, 19, 1, 2010, 71–86

De Benedictis, L., & Taglioni, D. (2011). The gravity model in international trade. In De Benedictis and L. Salvatici (eds), The Trade Impact of European Union Preferential Policies. Chapter 4, Springer.

De Beule, F., & Duanmu, J.L. (2012). Locational determinants of internationalization: A firm-level analysis of Chinese and Indian acquisitions. *European Management Journal,* 30, 264– 277.

Dimitratos, P., & Jones, M.V. (2005). Future directions for international entrepreneurship research. *International Business Review,* 14(2), 119– 128.

Disdier, A., & Head, K. (2008). The puzzling persistence of the distance effect on bilateral trade. *The Review of Economic and Statistics,* 90 (1), 37–48.

Dunning, J.H. (1977). Trade, location of economic activity and MNE: A search for an eclectic approach. In B. Ohlin, P. O. Hesselborn, & P. J. Wijkmann (Eds.). The international allocation of economic activity (398–418). London: McMillan.

Dunning, J.H., & Narula, R. (1995). The R&D activities of foreign firms in the United States. *International Studies of Management & Organization*, 25, 39–73.

Fletcher, R., & Bohn, J. (1998). The impact of psychic distance on the internationalization of the Australian firm. *Journal of Global Marketing*, 12(2), 47−68.

Freund, C., & Bolaky, B. (2008). Trade, regulations and income. *Journal of Development Economics* 87, 309-21.

Gabrielsson, M., & Pelkonen, T. (2008). Born internationals: Market expansion and business operation mode strategies in the digital media field. *Journal of International Entrepreneurship*, 6 (2), 49–71.

Gabrielsson, M., Kirpalani, V.H., Dimitratos, P., Solberg, C.A., & Zucchella, A. (2008). Born globals: Propositions to help advance the theory. *International Business Review*, 17, 385-401

Granstrand, O., Håkanson, L., & Sjölander, S. (1993). Internationalization of R&D. A survey of some recent research. *Research Policy*, 22, 413–430.

Grosse, R., & Trevino, L.J. (1996). Foreign direct investment in the United States: An analysis by country of origin. *Journal of International Business Studies*, 27, 39–155.

Hall, B.H. (2002). The financing of research and development. *Oxford Review of Economic Policy*, 18 (1), 35–51.

Hornberger, K., Battat, J., & Kusek, P. (2011). Attracting FDI: How much does investment climate matter?. Viewpoint Note 327, World Bank Group, Washington, DC.

Irwin, D., & Klenow, P. (1996). High-tech R&D subsidies: estimating the effects of Sematech. *Journal of International Economics*, 40, 323–344.

Jandhyala, S. (2012). Property rights and international investment in information technology services. *Strategic Management Journal*, doi: 10.1002/smj.2032.

Johanson, J., & Vahlne, J.E. (1977). The internationalization process of the firm: a model of knowledge development and increasing foreign market commitment. *Journal of International Business Studies*, 8(1), 23-32.

Klapper, L., Lewin, A., & Quesada Delgado, J.M. (2009). The impact of the business environment on the business creation process. Policy Research Working Paper 4937, World Bank, Washington, DC.

Knight, G., & Cavusgil, S.T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, 8, 11-26.

Kogut, B., & Singh, H. (1988). The effect of national culture on the choice of entry mode. J*ournal of International Business Studies*, 19(3), 411−432.

Kortum, S., & Lerner, J. (2000). Assessing the contribution of venture capital to innovation. *Rand Journal of Economics,* 31(4), 674–692.

Krugman, P. (1980). Scale economics, product differentiation and the pattern of trade. *The American Economic Review*, 70(5), 950–959.

Kuemmerle, W. (1999). The drivers of foreign direct investment into research and development: An empirical investigation. *Journal of International Business Studies*, 30(1), 1–24.

Kuivalainen, O., Sundqvist, S., & Servais, P. (2007). Firms' degree of born-globalness, international entrepreneurial orientation and export performance. *Journal of World Business*, 42(3), 253-267.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1998). Law and finance. *Journal of Political Economy,* 106, 1113–1155.

Le Bas, C., & Sierra, C. (2002). Location versus home country advantages' in R&D activities: Some further results on multinationals' locational strategies. *Research Policy,* 31(4), 589–609.

Lewer, J.J., & Van den Berg, H. (2008). A gravity model of immigration. *Economics Letters*, 99(1), 164-167.

Maskus, K.E., & Penubarti, M. (1995). How trade-related are intellectual property rights? *Journal of International Economics*, 39(3-4), 227-248.

Mclean, R. D., Zhang, T., & Zhao, M. (2012). Why does the law matter? Investor protection and its effects on investment, finance, and growth. *Journal of Finance,* 67,313‐50.

Naudè, W.A., & Krugell, W.F. (2007). Investigating geography and institutions as determinants of foreign direct investment in Africa using panel data. *Applied Economic*, 39(10), 1223–1233.

Park, W. (2008). International patent protection: 1960-2005. *Research Policy*, 37 (4), 761-766.

Peri, G. (2005). Determinants of knowledge flows and their effect on innovation. *The Review of Economics and Statistics*, 87 (2), 308–322

Picci, L. (2010). The internationalization of inventive activity: A gravity model using patent data. *Research Policy*, 39 (8), 1070-1081.

Porter, M.E. (1980) Competitive Strategy. New York: Free Press.

Santos Silva, J., & Tenreyo, S. (2006). The log of gravity. *Review of Economics and Statistics*, 88 (4), 641–658.

Shleifer, A., & Wolfenzon, D. (2002). Investor protection and equity markets. *Journal of Financial Economics*, 66, 3–27.

Stein, E., & Duade, C. (2007). Longitude matters: Time zones and the location of foreign direct investment. *Journal of International Economics*, 71 (1), 96-112.

von Zedtwitz, M., & Gassmann, O. (2002). Market versus technology drive in R&D internationalization: Four different patterns of managing research and development. *Research Policy,* 31(4), 569–58.

Wallsten, S. J. (2000). The effects of government–industry R&D programs on private R&D: the case of the Small Business Innovation Research Program. *RAND Journal of Economics,* 31(1), 82–100.

Zucchella, A., Palamara, G., & Denicolai, S. (2007). The drivers of the early internationalization of the firm. *Journal of World Business*, 42 (3), 268–280.

APPENDIX

Table 1A. Gravity model to test the factors influencing the internationalization flows of high-tech start-ups (OLS estimates). Robustness check for different measures of the geographic distance.

VARIABLES	Model	Model	Model	Model	Model	Model
	(1)	(2)	(3)	(4)	(5)	(6)
GDP_i	-0.274	-0.434*	-0.300	-0.447*	-0.290	-0.383
	(0.197)	(0.231)	(0.193)	(0.234)	(0.195)	(0.256)
GDP_j	0.252	-0.332	0.233	-0.366	0.258	-0.309
	(0.237)	(0.261)	(0.236)	(0.261)	(0.252)	(0.278)
$PATENTS_i$	1.297***	1.290***	1.280***	1.291***	1.296***	1.357***
	(0.194)	(0.213)	(0.205)	(0.233)	(0.210)	(0.257)
$PATENTS_j$	1.459***	0.766**	1.460***	0.819**	1.486***	0.773**
	(0.211)	(0.349)	(0.219)	(0.344)	(0.233)	(0.344)
$DIST\_CAPITAL_{ij}$	-0.633*	-0.662*				
	(0.330)	(0.382)				
$DIST\_WEIGHTED_{ij}$			-0.416	-0.575		
			(0.397)	(0.482)		
$TIME\ ZONE_{ij}$					-0.147	-0.269
					(0.131)	(0.176)
COMMON LANG	1.366	0.424	1.311	0.364	1.047	-0.001
	(0.861)	(0.835)	(0.856)	(0.828)	(0.867)	(0.842)
COLONY	5.255***	4.789***	5.013***	4.653***	5.245***	5.123***
	(0.794)	(0.792)	(0.767)	(0.782)	(0.875)	(0.953)
COMMON LEGAL	6.066***	7.092***	6.310***	7.235***	6.378***	7.326***
	(0.894)	(0.909)	(0.878)	(0.893)	(0.847)	(0.868)
$IPR\ PROTECTION_j$		3.420**		3.871**		3.804**
		(1.625)		(1.573)		(1.537)
$VC\ AMOUNT_j$		0.519**		0.529**		0.493**
		(0.223)		(0.229)		(0.225)
$INVESTOR\ PROTECTION_j$		0.835**		0.860**		0.845**
		(0.392)		(0.402)		(0.403)
$COST\ ENFORCEMENT_j$		-0.185*		-0.192*		-0.212*
		(0.110)		(0.114)		(0.116)
$COST\ EXPORT_i$		-3.496**		-3.317**		-2.861
		(1.671)		(1.682)		(1.746)
FDI_j		-1.684*		-1.945**		-1.734**
		(0.877)		(0.845)		(0.821)
$EXPORT_j$		0.786		0.756		0.939
		(0.873)		(0.894)		(0.938)
Country dummies i	yes	yes	yes	yes	yes	yes
Country dummies j	yes	yes	yes	yes	yes	yes
Constant	-25.136***	4.887	-26.214***	4.656	-29.709***	-7.406
	(5.935)	(16.517)	(5.773)	(16.791)	(7.421)	(21.347)
Observations	310	310	310	310	310	310
R-squared	0.733	0.796	0.730	0.794	0.730	0.796

Note: The dependent variable is $FLOW\ INTENSITY_{ij}$. Standard errors are in parenthesis. Country dummies (*i* and *j*) are not reported to save space. ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.