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Résumé de l'article

D'importantes preuves ont démontré que, les Petites Entreprise à Savoir Intensif (PESI) ont, durant leur processus d'internationalisation, d'uniques caractéristiques. Ce processus a lieu tôt dans la vie de l'Entreprise et se développe grâce aux rôles que jouent les partenariats. Cet article analyse les 3 différentes PESI, utilisant une étude de cas comparatif. Nous avons construit différents modèles de processus, étudiant l'avancement vers l'internationalisation des entreprises internationales. Découvrant ainsi que l'internationalisation des PESI se passe en plusieurs phases caractérisées par des facteurs déclencheur. Cet article présente donc les différents types de partenariat qui importe le plus pour le développement des PESI.

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# The Role of Partnerships in the Internationalisation Process of Small Knowledge Intensive Firms (SKIFs)

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**Résumé**

D'importantes preuves ont démontré que, les Petites Entreprise à Savoir Intensif (PESI) ont, durant leur processus d'internationalisation, d'uniques caractéristiques. Ce processus a lieu tôt dans la vie de l'Entreprise et se développe grâce aux rôles que jouent les partenariats. Cet article analyse les 3 différentes PESI, utilisant une étude de cas comparatif. Nous avons construit différents modèles de processus, étudiant l'avancement vers l'internationalisation des entreprises internationales. Découvrant ainsi que l'internationalisation des PESI se passe en plusieurs phases caractérisées par des facteurs déclencheur. Cet article présente donc les différents types de partenariat qui importe le plus pour le développement des PESI.

Mots clés : Processus d'internationalisation, entreprise à savoir intensif, partenariat

**Abstract**

There is important evidence that Small Knowledge Intensive Firms (SKIFs) have demonstrated some unique characteristics in their internationalisation process. The process takes place earlier in the life of the firm and develops due to the role played by partnerships. The paper analyzes three different SKIFs through a cross case study method. We build on different process based models that have studied the internationalisation process of international ventures. The findings show that the SKIFs internationalisation consists of a series of phases characterised by triggering factors. The paper sheds new light into which type of partnerships mostly matter in the growth of SKIFs.

Keywords: Internationalization process, knowledge intensive firms, partnerships

**Resumen**

Existe importante evidencia en la cual, las pequeñas empresas intensivas en conocimiento (SKIFs) han demostrado poseer algunas características únicas en su proceso de internacionalización. El proceso inicia en las etapas tempranas de la vida de la empresa y se desarrolla debido al papel desempeñado por las asociaciones. El presente artículo analiza tres SKIFs a través de un estudio de casos. Nos fundamos en diferentes modelos que han estudiado el proceso de internacionalización de las empresas. Los resultados muestran que la internacionalización de las SKIFs consiste en una serie de fases caracterizadas por factores desencadenantes. El documento arroja nueva luz a qué tipo de alianzas son las más importantes para el crecimiento de las SKIFs

Palabras claves: Proceso de internacionalización, empresas intensivas en conocimiento, asociaciones

The development of Knowledge Intensive Business Firms (KIBFs) is interpreted as an important trend in industrialized countries. This contribution highlights their international growth and thus adopts the perspective of international entrepreneurship studies (Coviello et al., 2011). In these studies, little attention has been paid to the drivers and the dynamics of internationalisation after the initial stage (Weerawerdena et al., 2007). In particular, there is a research gap in the understanding of the internationalisation process and of the overall growth path after the first years of existence. More specifically, different studies acknowledge the role of collaborations in the internationalisation process, but do not answer to the question of which typologies of partnerships have a major role, in which ways and in which stages of growth they impact foreign markets growth (Freeman, Cavusgil, 2007; Street and Cameron, 2007; Johanson and Vahlne, 2009). In developing this perspective, this contribution also highlights the nexus of foreign and local partnerships in driving global growth. It also shows how the international commitment of Small Knowledge Intensive Firms (SKIFs) has roots both in local and in foreign ties.

This research addresses the gap and focuses on the role of partnerships in explaining the evolution over time of international ventures, and small knowledge intensive firms (SKIFs) in particular. There is important evidence that SKIFs have demonstrated acceleration in the internationalisation process (Crick and Jones, 2000) and are often examples of Born Global Firms (BGs) or International New Ventures (INVs) (Rennie, 1993).

SKIFs are a relevant study field because they are paradigmatic of new industries and new typologies of firms where the internationalisation dimension is embedded from the beginning in firm processes and may be triggered by the development of partnerships more than any other business (Coviello and Munro, 1995; Keeble et al., 1998; Bell et al., 2004). Also in this specific field, it is however still unexplored the "which", "how" and "when" partnerships mostly matter and trigger the international growth path (Prashantham and Berry, 2004).

The gap addressed in this paper is not only relevant for theory development purposes, but also for policy making. The sustainable growth of knowledge intensive ventures can contribute to economic development and innovation

as well as management practices, since entrepreneurs and managers need to develop a better awareness of which typologies of collaborations mostly affect the internationalisation ,and consequently the growth, of their businesses. The entrepreneurs also need to develop an understanding of collaborations along the different stages of growth and the impact of partnering decisions on the speed and scope of international expansion.

Several authors have studied the internationalisation process of new and young firms. Given the positioning of this study in the international entrepreneurship field, we discuss some models, developed in this stream, which can be applied in addressing our research questions (Jones and Coviello, 2005, Zucchella and Scabini, 2007, Gabrielsson et al., 2008). We think that these models may be applied to SKIFs as well, since the latter usually pertain to the international entrepreneurship field. In particular, this paper will adopt the recent model of Gabrielsson et al., (2008), and it will try to apply this model on three SKIFs, in order to improve the understanding of their internationalisation process. This model permits to track along stages the longitudinal growth of a firm and permits to highlight critical events, triggering factors and subsequent path changes in the international growth of a company. This model also acknowledges the relevant and differentiated role of partnerships in different stages of growth. It mostly addresses distribution partnerships and does not deliver a thorough representation and interpretation of the issue. We expect to contribute to a further development of this model, by focusing on SKIFs and on their partnerships.

The paper aims to answer the following research questions: What are the factors that trigger the internationalisation process of SKIFs and, hence, affect their growth path? More specifically, it focuses on which partnerships mostly matter; when do they trigger most international growth and how do collaborations with other firms play their role?

Therefore, this paper proceeds to review some models of the internationalisation processes of international ventures as to be applied to SKIFs. by following a presentation of the methodology and data collection. A discussion of the findings and analysis of case studies follow, while concluding with the contributions and limitations of the study, as well as suggestions for future investigation in the area.

## The internationalisation proces of small knowledge intensive firms

'Knowledge-intensive' firms are defined, following Coviello (1994), as those "having a high added value of scientific knowledge embedded in both product and process".

To go somewhat deeper into this knowledge intensive character Groen (2004) referred to technological changes in, for example, information and communication technology, biotechnology, which induce important strategic changes.

Bell, Crick and Young (2004) suggest that differences exist in the patterns, processes and pace of internationalisation between small 'knowledge-intensive' and 'traditional' manufacturing firms. Differences between the two groups were evident in levels of commitment to internationalisation, the extent to which international strategies are planned, and regarding the methods. Among 'knowledge-intensive' manufacturing firms, findings include an international orientation from inception; a new product development process focusing upon the requirements of international markets and rapid internationalisation (ibid.).

Knowledge intensive firms show a strong growth orientation, they expand rapidly into a greater number of markets and they tend to adopt a more proactive approach to internationalisation. Rather than entering geographically or psychologically 'close' countries, SKIFs target lead markets or lead customers, regardless the distance between countries (Ojala, 2009; Arenius et al., 2005).

For the above reasons, these firms can be approached under the lenses of international entrepreneurship studies, in order to uncover their growth path and the factors which trigger them.

A significant factor that influences the accelerated internationalisation of SKIFs is reported to be inter-firm relationships, where the international network might include customers, competitors, suppliers, support agencies, research institutions. These network relationships influence SKIFs' choice of markets and market entry mode (Prashantham and Berry, 2004; Coviello and Martin, 1999; Coviello and Munro, 1995). The role of networks and partnerships is widely acknowledged in international business and international entrepreneurship literature (Mayrhofer, 2004); this paper supports the idea that this is even more true in the case of SKIFs. In fact, they are operating in a complex environment and have to deal with it notwithstanding the liability of smallness -as well as the one of newness in most cases (Freeman et al., 1983; Brüderl and Schüssler, 1990). The latter two go together with the liability of foreignness when these firms enter new markets abroad (Zaheer, 1995). In this context, the role of networks and alliances may be a key triggering factor for international growth. The term network defines in different disciplines a set of nodes and relationships among them (Fombrun, 1982). International business studies acknowledge networks as structural models of cooperation (Holm et al., 1996), and consider networks as a major conduit to foreign markets (Johanson and Vahlne, 2009). Their relevance is particularly highlighted in international entrepreneurship studies (Coviello, 2006; Kabbara, 2009). However, a few studies consider the perspective of dyadic partnerships and compare their role to the more general network construct (Anderson et al.,1994). Dyadic relationships are defined as

pairs of firms that are connected by an exchange relationship. According to Johanson and Mattson (1992), the term network refers to sets of two or more connected exchange relationships, supporting the idea that "building blocks of a network are dyads, which are specifically concerned with the ties between a pair of actors" (Larson, 1992, p.80). Our research perspective is represented by dyads and more specifically by those relationships which emerge; they are particularly influential in setting the path, rhythm, speed and scope of the international growth of SKIFs.

## Different models of internationalisation process

The aim of this research is the study of influential factors in the international growth of SKIFs, focusing on the role of partnerships. The choice for an international entrepreneurship (IE) perspective led us to find descriptive and interpretive models to support our research in this field. We acknowledge alternative models in other research domains. In different domains, there is a growing consensus that inter-organizational alliances have significant impacts on firm-level outcomes such as the performance of startups and new firms (Baum et al., 2000; Stuart, 2000). In this contribution, we opted for models which are specific to our research field. These contributions, developed in the international entrepreneurship literature, however, took into account and applied to the international business studies the more general contribution deriving from major studies in related disciplines. International entrepreneurship is a relatively young research domain, and there is still scarcity of models which can explain the international growth of young ventures, especially in a longitudinal and long term perspective (Jones et al., 2011). Research has targeted both the antecedents and the outcomes of the internationalisation of these businesses. (Rialp et al., 2005). Less attention has been paid to the drivers and the dynamics of internationalization after the initial stage (Weerawerdena et al., 2007).

Building on recent and thorough literature reviews in the IE domain (Keupp and Gassmann, 2009; Jones et al., 2011), we identified only four models which could be adopted for our study. In particular, we searched for models characterised by the following elements: focus on the internationalisation process (as organisational behaviour over time across geographic markets), recognition of networks and partnerships among influential factors, modelling potential (potential of extant model to evolve further into a temporal and action/event based frame of reference).

This paper first addresses the four models (Jones and Coviello, 2005, Johanson and Vahlne, 2009, Zucchella and Scabini, 2007, Gabrielsson et al., 2008). After discussing their properties and their fit with our research aims and scope, we select one of them as the supporting frame of reference and of data representation for the case study analysis. The objective is to develop further or to disconfirm the chosen model.

In Table 1, we found it relevant to separate the first two models – Jones and Coviello, 2005, Johanson and Vahlne, 2009- from the latter two, because the first ones provide a more general theoretical frame and key constructs (time, behaviour, value creating events, learning and knowledge, opportunities, networks, commitment). The latter two provide a frame for analyzing the development of the internationalisation process of entrepreneurial firms (Zucchella and Scabini, 2007; Gabrielsson et al., 2008), identifying phases in their international growth and related internal and external triggering factors.

Jones and Coviello (2005) developed a model where entrepreneurial internationalisation behaviour is described as it might be experienced by any firm, in any industry. This general model considers many variables affecting internationalisation concerning the dimensions of time and behaviour. The most relevant variables regard entrepreneurial and firm factors, but also environmental and performance factors. According to the authors, internationalisation of any entrepreneurial typology of firm occurs as 'value-creating events', consisting of cross-border business activities between the firm and organizations or individuals in foreign countries. Among value creation events, collaborations with other firms thus play a significant role.

The recent Johanson and Vahlne (2009) model provides a revised version of the original model that the authors proposed in 1977. The authors claim that internationalisation depends on a firm's relationships and business networks. The model depicts dynamic cumulative processes of learning. According to the authors, internationalisation is seen as the outcome of the focal firm embedded in networks. This is fundamental when knowledge intensive industries are involved, because the literature associates their early and fast international growth with an orientation to seek knowledge opportunities through network commitment and learning.

Zucchella and Scabini (2007) propose a theoretical frame where learning and capabilities are the fundamental issues. The international entrepreneurship process first involves international opportunities scanning, enacting and evaluation. Once opportunities in the overall market-place are identified and evaluated, the entrepreneur or top management team mobilizes resources in order to develop new combinations for the market. This leads the international entrepreneurial organizations to develop dynamic capabilities (Teece et al., 1997). Networking and learning from multiple sources, such as experiential, congenital, vicarious, grafting (Huber, 1991) feed intense and rapid learning processes in international entrepreneurial organisations. In this way, dynamic capabilities are developed, which enable the firm to perform along its life. Inter-organizational partnerships represent a potentially important resource for the development of ambidexterity (Kauppila, 2010). An ambidextrous organizational context (O'Reilly and Tushmann, 2008) enables the firm to reap the distinct benefits of both

exploration and exploitation partnerships and supports long term growth. These processes are expected to be particularly relevant in knowledge intensive firms and to affect in a significant way their international growth, even though there is scarce evidence on the differentiated nature of alliances in international entrepreneurship studies.

The three mentioned models provide key constructs for this research and have in common the idea that networks and partnerships are highly influential factors for the internationalisation process, but remain vague about the timing of this influence along the growth path of the firm (When?) and about the typology of collaborations which most matter (With whom? Which strategic aim?).

Concerning Gabrielsson et al. (2008, p.388) model, the authors focus on born global firms, defined as "one having products with global market potential, it can combine this potential with an entrepreneurial capability to seek methods of accelerated internationalisation". The definition may well fit with the young SKIFs, especially when they have to compete in businesses where the scale is naturally global, such as in the science-based and high tech ones. In this model the authors consider that these firms progress through three phases: Phase One is the introduction and initial launch phase. Phase Two comprises growth and resource accumulation. Phase Three is the break-out phase where born global firms can elect to break out onto a new path and/or new market.

In the introductory phase, the authors suggest that the born global firm has limited resources. The entrepreneurs needs to possess an advanced level of international business expertise in order to accelerate the internationalisation' process. The firm seeks to collaborate with a larger multinational enterprise or with foreign distributors to gain markets access.

In the second phase, the authors consider that the firm's organizational learning occurs by learning from the partners and initial customers with whom it cooperates. At this stage, the firms may plan a global market positioning of their own, which can be totally or partially independent of the original key customers and develops new strategic partnerships.

The model by Gabrielsson et al., (2008) emphasises the importance of partnerships as a triggering factor of the internationalisation of the firm. It also highlights along different stages the timing of key collaborations and supports the idea that some types of partnerships matter more, in different stages of the life of the firm. This model also addresses more specifically the perspective of dyadic partnerships and not only the general network structure, therefore, permitting to uncover which ties most support growth and when this happens. This model will be applied in this paper on a typology of firms (SKIFs) in order to understand their growth path and recognize the triggering factors of their internationalisation. Though Gabrielsson et al. model was conceived for understanding the growth of born global firms, we hypothesize it can provide a frame for our research purposes because it addresses firms characterised by high knowledge intensity and positioning in (potentially) global niches. Through this research we expect to contribute to the further development of this model.

## Research methodology

Qualitative methods usually prove particularly useful in addressing explorative research and in answering questions regarding the "how" some processes occur. Therefore, and following suggestions by Eisenhardt (1989), the multiple case-study method was selected for this study. In order to answer the research question and for our observation of potential phases in growth processes, it is essential to adopt a longitudinal approach (Matthyssens and Pauwels, 2001).

We contacted twenty small-medium sized knowledge intensive firms, with similar foundation period and governance, but only six accepted to be studied for a long period. From the six case studies, three companies closed their business or changed governance during the study period. Consequently, three longitudinal case studies are discussed in this paper. The three firms allowed for interviews to be held with their senior executives (entrepreneur and CEO) along their life since their foundation and showed rich secondary sources of data, to enable accurate triangulation with interviews. The three firms are relatively new (on average ten to fifteen years of operations) but still provide adequate temporal horizon for a longitudinal approach. They are located in the Lombardy region, which provides a common institutional framework where business actions develop and allow the concentration on these firms, instead of assessing differentiated impacts of different institutional frameworks.

The firms belong to three different industries: software development, biotechnology and laser technology.

Software firms have commonly been used as a target group when analyzing internationalisation of knowledge-intensive SMEs (Bell, 1995; Coviello, 2006; Moen et al., 2004; Zain and Ng, 2006). This has been mainly connected to the intangible nature of product and dependence on adequate knowledge (Almor and Hashai, 2004).

The biotechnology industry should be viewed as a scientific and technological platform that provides new knowledge to a series of downstream sectors. It is a case of industry where international entrepreneurship, science and technology are inter-related (Onetti et al., 2012). The biotech industry is widely recognised as one of the main cases of distributed innovation (for red biotechnology in particular), and its development rests primarily on networks and strategic partnerships (Hagedoorn, 1993; Powell et al., 1996).

The production of laser technology-based devices is another case of high tech industry where the manufacturing

**TABLE 1**

**A comparative table of internationalisation's process models**

| Characteristics | Jones and Coviello (2005) | Johanson and Vahlne (2009) | Zucchella and Scabini, (2007) | Gabrielsson et al., (2008) |
|---|---|---|---|---|
| Unit of analysis | Entrepreneurial firm | Internationalising firm | International entrepreneurial organization (IEO) | Born global firm |
| Temporal orientation | The internationalisation process | The internationalisation process | The IEO life | Early stages of BG life |
| Spatial orientation | International markets | From psychic distance from markets (1977) to network distance (2009) | Glocal (global orientation and local clusters embeddedness)<br>Industry positioning (ex. niche) and lead customers determine space orientation | Industry and customer driven |
| Process | Cyclical behaviour | Inter-relation of state and change dimensions based on business networks | Four recursive steps<br>• International opportunity<br>• International resource mobilization<br>• Dynamic capabilities<br>• Performance | Three phases:<br>Phase 1: introduction<br>Phase 2: growth<br>Phase 3: break out |
| Variables triggering internationalisation | • Entrepreneur<br>• Value creating events<br>• Performance | State variable<br>• Knowledge, opportunity<br>• Network position<br>Change variable<br>• Relationships, commitment decision<br>• Learning, trust building | • Entrepreneur/TMT capability<br>• Resources mobilization<br>• Network access and learning<br>• Industry positioning<br>• Organization learning and dynamic capabilities | Phase1: international business expertise of the entrepreneur<br>Network channel established by the firm<br>Phase 2: learning from partners/network members<br>operating firm in global industry<br>Phase 3: firm's independence from customers |
| Model reference | • Fingerprint patterns<br>• Profile/dynamic profiles | Firm' relationship | Learning process | Importance of channels and networks. |
| Theories underlying model | Entrepreneurial process (Brazael and Herbert, 1999) | Uppsala model (J&V, 1977), network model of internationalisation (J&M, 1988) | Dynamic Capabilities (Teece et al, 1997) | INVs and BGs theories |

*Source: the authors*

activity is as important as the research and development and the international distribution ones. Developments in science and technology on a global scale need to be monitored and collaborations might affect both R&D and product distribution in different countries.

Data collection involved a series of inductive interviews at each site using the procedures outlined by Eisenhardt (1989). The type of interview (with the CEO or the founders) was face-to-face and in-depth enabling the interviewer to explore a few general topics through discovering the participant's view (Marshall and Rossman, 1999). The interviews in each firm were repeated every three years starting from 2004, with a total of three interviews for each company. In collecting the data, we framed the interview around a series of questions related to the following topics: the background of the managers, the origins of the firm and its collaborations, the internationalisation of the firm in terms of how and why it internationalised, and its national and international collaborations. Complete case reports were sent back to the persons interviewed to ensure validity and authenticity of the collected data. Whenever interviewees in the case firms found some inaccuracies in the text, these were corrected based on their comments.

In addition, some telephone and e-mail interviews were used to collect further information from the interviewees. Besides, the process of data collection relied on a triangulation of sources, namely personal interviews, on-site observations, verbal reports and archival data analysis. By ensuring data collection from several sources, we increased the quality of the data obtained (Eisenhardt, 1989).

The interview notes were carefully transcribed and read in order to form a general understanding of the studied phenomenon. The theoretical (theory building) analysis was conducted through theoretical memos in a team (the two co-authors), to ensure confrontation of perspectives and triangulation of interpretations following the prescription of grounded theory protocol (Corbin and Strauss, 1990).

## Cross case studies analysis

A first finding is that the companies reported three distinct stages in their life, with little differences in terms of duration of each phase, confirming the basic frame of Gabrielsson et al. (2008). The key issue in each of the three phases corresponds nicely to the content suggested by the mentioned authors. We outline below each stage with a selected verbatim, in order to illustrate this finding.

In order to answer to the research questions, we then framed the case evidence in the above model and explored the behaviour of the three firms (and especially the characteristics and the role of partnerships along their international growth) throughout each phase of their life cycle. In doing this, we could also highlight some differences with the adopted model.

- *Phase 1: the introductory phase*

*"Our first two-three years have been very difficult. At the start we thought we could conquer the world with our bright ideas, but we soon had to face the reality of business. And business management was so different from managing a research project in a lab"*

In all the cases, the start-up phase lasts approximately three years and is characterised by high uncertainty regarding industry positioning and growth perspectives. The role of the entrepreneurial team is crucial in identifying the core business. They are all run by scientists or by people with academic background, but limited managerial expertise. In all these cases, as it frequently happens in the knowledge intensive industry, commercial, marketing, administrative and financial skills are scarce and the firm is mostly focused on developing new products/services. In the case of Molmed, the biotech firm, the founder is a well renowned scientist, surrounded by a strong team and supported by private equity. The other two companies are founded by younger people, and relied extensively on own resources and self-financing to set up the business and to grow. FMR was founded by two young PhD scholars of Physics. The collaboration with universities is vital for supporting the firm

**Presentation of the three companies**

1) Molmed is a medical biotechnology company focused on the discovery, development and clinical validation of innovative therapies for the treatment of some forms of cancer. Since March 2008, its shares are traded on the Milan Stock Exchange. It was founded in 1996 on the pioneering clinical expertise of a team of scientists led by the company's chairman and chief executive officer (the entrepreneur) and located the Science Park of San Raffaele University and Hospital in Milan.

2) FMR Consulting is a company specialized in quantitative finance and especially in software for financial analysis; it was founded in 1994 in Voghera, close to Milan. The mission is to translate the new discoveries that emerge from the world of research into new technologies and products, and to distribute innovative solutions to the global final users.

3) Bright Solutions was founded in 1998 close to Pavia (like in the previous cases, in the metropolitan area of Milan) by a small group of Italian laser scientists with a thorough experience in laser engineering. It is oriented towards the development of state-of-the-art diode-pumped solid-state laser systems (DPSS).

**TABLE 2**

**Key information on the case firms**

| Name of the firm | Type of industry | Year of foundation | Number of employees in 2010 | Turn over (€ 000s) in 2010 | Date of first foreign collaboration | Geographic scope |
|---|---|---|---|---|---|---|
| **MOLMED** | Biotechnology | 1996 | 85 | 2,676 | 2001 | Asia (Japan)<br>Europe (UK) |
| **FMR** | Software for finance (analytic libraries, pricing engines) | 1994 | 22 | 2,135 | 1999 | UE<br>Israel<br>Asia (Malaysia) |
| **BRIGHT SOLUTIONS** | Laser industrial applications | 1998 | 20 | 3,000 | 2001 | Europe<br>Asia (China, Korea)<br>USA<br>Israel |

*Source: the authors*

access to advanced knowledge in quantitative methods. FMR has always conceived its products as naturally global ones, because the main customers are international banks.

Bright Solutions was founded in 1998 by two professors in engineering and by a young PhD, who had developed research projects on laser technology with the former two during his academic activity. Licensing this technology to lead customers in the world has been the main company strategy from the beginning. Notwithstanding a naturally global orientation, the company did not report foreign sales until 2001, which may be considered the take-off year.

The role of collaborations in the case firms can be described as vital in this introductory phase. Each firm followed different channels available in order to access the rapid growth in the global marketplace, but for all of them, relationships with distributors and final key customers have been crucial in the beginning stages.

In Molmed's introductory phase, the main concern was about establishing partnership in order to in-license technologies and to develop its research activity. The same research collaborations with universities and research centres are fundamental to nurture continually the core activity, which is R&D based. These relations depend on the international reputation of its entrepreneur supported by a hundred of top publications. The company has a naturally global orientation, due to the nature of its research activity, even though it does not report any sales both in the domestic and in the international markets (Zucchella and Kabbara, 2011). This is coherent with the peculiar characteristics of the industry, characterized by long research pipelines and deferred revenues.

- *Phase 2: growth and resource accumulation*

*After the rollercoaster of the first years, I soon realised that the entire organisation needed to grow and get ready for new challenges. It was longer about me getting ready for business. There were people and other assets to work on, but the speed of competition was too fast for only internal learning. The organisation needed to learn from a few valuable partners. And foreign markets access was achieved effectively through key partnerships. All this effort took 5-6 years' time.*

The findings revealed that in this stage the organizational learning becomes crucial, even though the sources of learning differ from one case to another. While FMR and Bright Solutions take their source of learning from lead customers, Molmed learned from a variety of partners with highly differentiated knowledge bases, ranging from big pharmaceuticals to research centres and health care institutions, to venture capitalists. Learning from the management was also important to Molmed, by hiring highly qualified staff with both managerial expertise and knowledge of the specific business. Molmed experiences a first take-off in 2001, three years after foundation, when its R&D activity matures up to a point where it can build collaborative in and out licensing agreements with different organisations (Japan and UK). After 2001 the company also decided to start a production activity rather than focusing solely on R&D. This allows to stabilize long term returns and to move towards a more vertically integrated business model.

FMR experiences a second stage of growth from 1998 to 2001. During this period, the employees grew from nine to twenty units while sales doubled, exceeding one million Euro. The growth pace, especially considering revenues, reduces significantly compared to the first period. The idea

is to concentrate on lead customer needs, trying to provide a more complete and updated range of products and services. As a consequence, the secondary business of aerospace physics activities is allocated to a spin-off company dedicated to software development and data analysis in this area. This re-focusing permits to FMR to launch new projects in the core business, to develop new products and project development and consulting services.

For Bright Solutions after 2001 a time of high growth begins, after a relatively slow start up period. This second phase corresponds to the start of the internationalisation activity, with an export intensity rate jumping in 2001 from 0% to 47% through the development of ties with foreign distributors. The CEO manages directly commercial relationships and meets both distributors and final customers, in order to support the understanding of the firm's technology.

- *Phase 3: break-out phase*

*"After some years into the business, I had to confront myself with the question: should I stay or should I go? Should I try to maintain the business as it is or should I jump to the next level?"*

The case findings indicate that the three firms interpreted in different ways their break out phase. The latter might frequently not occur at all, leaving the firm in a steady state of "not fulfilled growth", which is particularly frequent in small Italian companies. This state might depend on lack of resources and strategic vision for growth, as well as in a deliberate willingness by entrepreneurial team to avoid changes in governance. In other cases, the firm might not survive to the fast growth phase due to imbalances in financial variables and in market consolidation.

For Molmed the break phase corresponds to its listing in Milan Stock Exchange in 2008, ten years after foundation, leveraging on the support of venture capitalists and financial institutions which boosted growth. The firm has no profits and low revenues: this is a common feature in red biotech research intensive business. If we look instead at the employees figures, Molmed has more staff than the other two firms.

In its third stage Molmed becomes more international and more independent from its initial partners, paving the way to expand further its partnerships at a global level.

Bright Solutions experiences from 2005 an even more pronounced growth path than in its previous stages of life, with average revenues growth by 60% each year, still maintaining its limited staff. The introduction of new production lines of laser from 2004 and the establishment of strong relationships with a US and an Israeli distributor are the triggering factors. Growth is quickly achieved through commercial partnerships. The export intensity rate has reached 80% in 2007. Bright Solutions pointed out the Asiatic, American and Chinese markets. However, the company experiences a stagnation period, especially after 2008. The company is not willing to engage into new partnerships, the governance is afraid to lose control on operations and does not also consider the hypothesis of finding more resources and competencies with new shareholders.

FMR had a different path to break out. Being established three or four years before the other two firms, it did not experience break out until 2007. From 2002 to 2006, the company's revenues and employees stabilize, while the firms continues on the strategy set up in the previous stage. From the commercial point of view, export intensity rates rise from 9% in 2006 to 16% in 2008 and the firm gains access to new foreign markets. The firm consolidates links with key customers and a few partners. Among the latter, the List Group, a privately owned company and representing a relevant partner since 1997, evolved into main partner. List is market leader in the development of technology for electronics markets and has a worldwide distribution network in Europe, USA and the Far East. In 2006, List acquired the majority stake of FMR.

## Discussion

The analysis of the case studies framed along Gabrielsson et al. (2008) model is summarized in Table 3. The three companies belong to three very different domains in the knowledge intensive sector but still can be compared, thanks to a common founding background (the university, which nurtures science-intensive firms), and a common institutional background. In fact, they are all located in Northern Italy, in the metropolitan area around Milan, which is one of the most economically advanced Italian regions. There companies were new ones and may suffer presumably from similar financial constraints such as shortage of external sources of finance, absence of public support, and limited managerial skills markets for science intensive firms. Apart from industry specific traits, which may be particularly evident in biotechnology, where capital needs are large and break even time much uncertain and anyway postponed of many years, the analysis of the three companies permits highlighting some common factors which have influenced their growth path, with different outcomes. Comparability is also ensured by similar demographic traits such as the age, the founders still manage the companies, a similar exposure to global competition, a knowledge-based type of business. The firms show some common traits in the internationalisation decisions, because they tend to rely on developing their products and services in the home country and then exporting directly or via intermediaries.

The firms respond well to a concept of international growth driven by value creating events (Jones and Coviello, 2005). More precisely, the capacity of the firms to maximize the knowledge opportunities embedded in relationships depends in the first years on the firm strategic intent and vision and on the founders' preparedness to cope with the challenges of global competition. In the following years the

capacity of top managers and founders to enhance organisational learning becomes increasingly relevant (Zucchella and Scabini, 2007). In knowledge intensive firms, long term growth seems to leverage on maintaining the capacity to innovate, and at the same time improving the existing products and processes. In both activities, the role of partnerships is very important due to the system of dyadic ties. This includes both partnerships aimed at exploring new opportunities. Some examples include the ties with university research centres, as well as with key customers and partnerships aimed at exploiting existing opportunities, like commercialisation agreements and alliances with distributors). The long term development of these firms thus requires organisational ambidexterity (O'Reilly and Tushman, 2008) and partnerships support the mentioned ambidexterity. Our study thus supports the finding that inter-organizational activities, such as customer relationships (Im and Rai, 2008), and strategic alliances (Lin et al. 2007, Rothaermel and Deeds, 2004), can enable both exploitative and explorative knowledge processes.

In these industries the firms access to global customers directly or through distributors. This access is the triggering factor which mostly explains the growth path in all the three cases studied. Though this finding may appear obvious, it is surprising how scarce literature is regarding the role of distribution and commercialisation partnerships as key drivers of international performance, along both the speed and the scope dimensions (Nummela et al., 2005).

The role of collaborations with other firms is confirmed and it is possible to develop a better understanding of the timing of key relationships and how their nature affects speed and scope of the international growth. Our research findings point out the double edged sword of these collaborations: in providing fast access to global markets, they also create dependence, unless they are structured to generate both general and specific market knowledge (Johanson and Vahlne, 1977) for the SKIF. Molmed is the most successful and growing firm, in part due to its capacity to diversify and to manage commercial collaborations in order to extract, not only sales opportunities, but also knowledge about markets, final customers and channels. The other two companies are more passive partners; they miss learning opportunities and gradually become dependent on the other party. Consequently, they enter either into a stagnate (Bright Solutions) phase or into a 'take over' stage (FMR, acquired by its main partner).

These findings permit to highlight a substantial development of Gabrielsson et al. model, regarding the third phase (the so-called break out). The exact nature of this phase remained somehow undetermined in the above mentioned model, though it is critical in order to understand the effective long term performance of firms. We can now hypothesise three different outcomes, take off, stagnation and exit), which can be validated in further studies and with quantitative analyses. The aim is to measure how the content, evolution and learning of partnerships affect the outcome of the internationalisation process.

In addition to this, we find evidence that commercial and distribution agreements are vital for early and fast start of international sales, but their double edged sword nature becomes progressively more evident along time. As a consequence, the second stage is particularly important for establishing more diversified partnerships and for the development of the double learning activity: first, extracting knowledge about markets and customers from partners and second, setting up organisational learning routines, in order to share the new knowledge in the organisation, outside the entrepreneurial team. In the second stage, the role of the entrepreneur, which in the first stage was a key driver of success, may become a limit to growth, unless the entrepreneur is capable of supporting organisational learning.

From this point of view, our findings highlight that, notwithstanding the key role of distribution partnerships, other typologies of collaboration need to be considered. In fact, an additional fundamental difference from Gabrielsson et al. model, rests in the relevance of partnerships with broadly intended 'suppliers', like suppliers of science (universities and research institutions), of technology (in-licensing), of patient capital and managerial support (venture capitalists). Many of these collaborations are more frequent in knowledge and research intensive industries, so they may reflect partially the specificities of SKIFs. The integration of Gabrielsson et al. model with a boarder range of partnerships, which have a relevant role as 'value creating events', can provide a more complete picture of organisational learning and performance over time.

In a longitudinal perspective, maintaining and diversifying R&D and technology partnerships contributes to enhance absorptive capacity, organisational learning and finally dynamic capabilities (O'Reilly and Tushman, 2008). Also from this perspective, the three companies show different outcomes, the most "open" to diversified sources of learning and to in-source knowledge through partnerships is Molmed, which takes off via public offering. Bright solutions and. to a less extent, FMR maintain a stable collaboration with some researchers, but does not enlarge and diversify over time their research network. They also both reject the idea of external managers, of venture capitalists or business angels, thus limiting further their capacity to learn and to grow.

## Conclusions

The theoretical contribution of this research is to the theory development process, because it integrates extant stage models of internationalisation in two ways. First, we define better the different stages of international growth of entrepreneurial firms, identifying three phases, specifying how each phase contributes to the firm long term performance, and developing a different perspective about the third stage.

**TABLE 3**

**The phases of international growth observed in the case studies**

| | **Phase 1 (foundation-2001) Set up entrepreneurial governance** | | | | **Phase 2 (2001-2007) Organizational learning** | | | | **Phase 3 (2008-2012) Break out** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Entrepreneurial team | Collaborations | | | Organisational learning | Collaborations | | | Break out strategy | Collaborations | | |
| | | Partner | Type | Location | | Partner | Type | Location | | Partner | Type | Location |
| **MOLMED** | Highly reputated founder from academia, highly skilled and diversified management team | Universities Research centers, hospitals | Research & development agreement | Europe | Big Pharma research center healthcare institution venture capitalists new management | Universities, Biotechnology companies | Partnership | Italy UK | Public offering | Pharmaceutical companies, Distributors, Hospitals Research centers | Licensing In and Out | Italy Europe USA Japan |
| | | Venture capitalists | Private equity | Europe | | Big Pharma | Out-licensing | Japan | | | | |
| | | | | | | Research centers and hospitals | In-Licensing | Italy UK | | | | |
| **FMR** | Founders from academia, physics and management Phd., but the latter exits soon, failure in integrating managerial competences in top management team | Lead customers | Partnership | Europe | Lead customers | Distributor | Distribution partnership | Israel Spain Poland | Take over | The firm becomes a subsidiary | - | UK Spain France East-Asia |
| | | Distributor | Distribution and commercial relationships | UK | | Customer (banks, insurance) | Commercial partnership | Turkey UK Malaysia | | | | |
| **BRIGHT SOLUTIONS** | Founded by an academic and young PhDs. The governance is short of managerial skills | Distributors | Distribution partnership | Italy | Lead customers | Distributors | Commercial partnership | Italy Korea China USA Israel | Stagnation | - | Difficulties in establishing new partnerships | |
| | | | | | | Final customers | Commercial partnership | Italy Korea China | | | | |

*Source: the authors*

The latter is hypothesised as articulated along three different outcomes; take off, stagnation, and exit, depending how the move from the first to the second stage is managed. Second, we find that the different outcomes are the consequence not only of the successful establishment, but also of successful management over time of relationships with other organisations, especially in terms of learning enhancement for the entire organisation.

The growth process of SKIFs is entangled in the internationalisation one, but in more complex ways than in traditional businesses, being deeply embedded in partnerships with customers, distributors and knowledge providers, which determine the process timing, speed and scope. For small firms in the knowledge intensive arena, the global niche positioning is fundamental for survival and success and provides a naturally born global orientation, but when and how effective this orientation is, depends on the types of partnerships established.

These findings raise new issues and research questions. First, the role of commercial partnerships is crucial for the understanding of global growth in SKIFs from the start, and there is a need to generalise this outcome for different types of firms and to further develop the knowledge about this scarcely explored field. Moreover, it is understudied their double edged sword nature, even though it represents a key issue in the success or failure of international growth.

Second, the analysed case studies are evidence that diversified learning processes are a relevant driver of international growth (learning from partners, learning for professional management, etc). Molmed is an excellent example of the last case, as it calls for a systematization of multiple learning sources in young ventures. From the managerial point of view, the findings indicate that managers should actively and early develop their core relationships to achieve market entry to the leading markets. Moreover, managerial work should be addressed to assessing potential and actual partnership performance in terms of learning, and not only for short term profit contribution). Finally, the activities of learning from multiple sources are frequently left to a spontaneous approach, which in many new ventures is only based on personal ties of the entrepreneurial team. Successful business planning should also include organisational learning issues and scanning of partners with relevant learning potential.

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