

# The impact of equity investments, venture capital, international social capital and public support on the growth and internationalization of Finnish technology start-ups

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Joonas Korkealaakso  
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**Author** Lauri Joonas Korkealaakso

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**Abstract**

The objective of this Master's Thesis is to research and evaluate the impact of the external factors of equity-based funding, venture capital, international social capital and public internationalization support on the revenue growth and internationalization of Finnish technology start-ups.

This research is organized as a quantitative study of the effects of equity funding, venture capital, international social capital, and public internationalization support on the subsequent growth and internationalization of 61 comparable Finnish technology start-ups that applied for the BornGlobal™ project in between August 2006 and August 2008. The theoretical framework and hypotheses for analyzing the impact of each of the identified factors were formed from prior academic literature and prevailing knowledge in the spheres of Born Global, start-up growth, venture funding, and social capital research. To test the applicability of the theoretical framework and generated hypotheses, quantitative tests of non-parametric design were utilized as the assumption of normality could not be sufficiently substantiated in the dependent variables. The utilized tests comprised of the Pearson's Chi-Square Test of Independence, the Mann-Whitney test, the Kruskal-Wallis test, and the Spearman Correlation Coefficient.

This study satisfies the set research objective and answers the postulated research question comprehensively by extending the knowledge on the impact of external factors on the growth and internationalization of Born Global firms. The empirical analysis supports the claimed advantages of independent venture capital funding and international social capital in the top management on the revenue growth and internationalization performance of the sample start-ups. On the other hand, the hypothesized effects of public internationalization assistance, equity funding, and the positive relationship between the dependent variables of growth and internationalization did not receive statistical validation. Moreover, the study extended the contemporary research on the effect of the selected external factors on Born Global growth and internationalization to the Finnish business environment.

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**Keywords** Born global, growth entrepreneurship, internationalization, international business, start-ups, private equity, venture capital, social capital

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**Tekijä** Lauri Joonas Korkealaakso

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**Työn nimi** Pääomasijoitusten, riskipääoman, kansainvälisen sosiaalisen pääoman ja julkisen kansainvälistymistuen vaikutus suomalaisten teknologia startup-yritysten kasvuun ja kansainvälistymiseen

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### Tiivistelmä

Tutkimuksen tarkoituksena oli selvittää ja arvottaa eri ulkoisten tekijöiden vaikutuksia suomalaisten teknologia-aloitusten startup -yritysten kasvuun ja kansainvälistymiseen. Kartoitettavia ulkoisia tekijöitä olivat julkinen kansainvälistymistuki, pääoma- ja riskisijoitusten saanti, sekä kansainvälinen sosiaalisen pääoma.

Tutkielma on kvantitatiivisia menetelmiä hyödyntävä selvitys julkisen kansainvälistymistuen, pääoma- ja riskisijoitusten, sekä kansainvälisen sosiaalisen pääoman vaikutuksista uusien suomalaisten teknologiayritysten kasvuun ja kansainvälistymiseen. Tutkimuksen otoksena toimi 61 itsenäistä teknologia-aloitusta startup -yritystä, jotka hakivat BornGlobal™ kansainvälistymisprojektiin Elokuun 2006 ja Elokuun 2008 välisenä aikana. Tutkimuksen teoreettinen viitekehys ja testihypoteesit muodostuivat aiemman kirjallisuuden pohjalta yhdistäen niin kansainvälisen liiketoiminnan, yrittäjyyden, rahoituksen, kuin myös sosiaalisen pääoman tutkimuksia. Tutkielman muuttujien välisen riippumattomuuden testaamiseen käytettiin ristiintaulukointia, Mann-Whitney U -testiä, Kruskal-Wallis -testiä, sekä Spearmanin rho järjestyskorrelaatiokerrointa.

Tämä tutkimus vastaa asetettuihin tavoitteisiin ja tutkimuskysymyksiin kattavasti lisäämällä tietoa valittujen ulkoisten tekijöiden vaikutuksesta startup -yritysten kasvuun ja kansainvälistymiseen. Tutkimuksen empiirinen analyysi tukee oletettuja hyötyjä, joita saadut riskisijoitukset sekä johtoportaan kansainvälinen sosiaalinen pääoma tuovat uusien teknologiayritysten kasvuun ja kansainvälistymiseen. Sen sijaan hypoteesit julkisen kansainvälistymistuen sekä pääomasijoitusten vaikutuksista kasvuun ja kansainvälistymiseen eivät saaneet tilastollista tukea. Myöskään kasvun ja kansainvälistymisen kahdenvälisestä positiivisista suhdetta ei pystytty vahvistamaan. Tämän lisäksi tutkielma jatkaa ajankohtaista tutkimustyötä selvittämällä miten valitut ulkoiset tekijät vaikuttavat Born Global -yritysten kasvuun ja kansainvälistymiseen Suomen liiketoimintaympäristössä.

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**Avainsanat** Born global, kasvuyrittäjyys, kansainvälistyminen, kansainvälinen liiketoiminta, startup-yritykset, pääomasijoitukset, riskipääoma, sosiaalinen pääoma

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## **1 INTRODUCTION**

Over the past two decades the emergence and proliferation of rapidly internationalizing new technology-based ventures as important sources and drivers of new economic growth has attracted the attention of researchers, practitioners and decision-makers worldwide (Jolly, Alahuhta, and Jeannet, 1992; Rennie, 1993; Oviatt and McDougall, 1994; Madsen and Servais, 1997; Luostarinen and Gabrielsson 2004). These entrepreneurial ventures, customarily referred to as Born Globals “from or near founding obtain a substantial portion of total revenue from sales in international markets (Knight and Cavusgil, 2004, p.16),” differentiating their expansion process from the development of other SMEs by the speed and precocity at which their internationalization occurs (Gabrielsson and Kirpalani, 2012).

With global macroeconomic shifts and technological advances converging markets ever closer, it is necessary for technology intensive start-ups to internationalize early and rapidly to succeed and fend off potential competitors and imitators (Gabrielsson, Sasi, and Darling, 2004). This new prerequisite to success is in particular customary to Born Global ventures originating from small and open economies, such as Finland, in which the undersized domestic markets cannot consistently accommodate the growth requirements of these ventures (Luostarinen and Gabrielsson, 2004). However, as start-ups that internationalize practically from their foundation, Born Globals are recognized as being inherently disadvantaged by their young age, small size, and foreign disposition in comparison to their established competitors (Zahra, 2005). From amongst the various resulting impediments prior entrepreneurial and international business research has highlighted the extensive lack of financial and knowledge resources as being amongst the decisive hindrances for Born Global growth and internationalization (Freeman, Edwards, and Schroder, 2006). In Finland, particularly deficiencies in the availability of international expertise and risk funding have been identified as key challenges for young technology based ventures during their early expansion.

While conventional internationalization theories proposed a gradual learning-based approach for accumulating the resources and capabilities required by growth and internationalization (Johanson and Vahlne, 1977; Luostarinen, 1980), this advocated incremental expansion was not able to explain the immediacy by which Born Global firms came to possess the vital assets to support their rapid expansion (Oviatt and McDougall, 1994). Subsequently, identifying the various means through which Born Globals attain these critical resources precociously has become a focal point of study in several academic disciplines (Zahra, 2005). In this study, two divergent streams of business literature, explicitly the theories on venture and social capital, are examined as potential factors for the successful early and rapid growth and internationalization perceived in Born Global firms.

Based on similar justifications, the BornGlobal™ project, henceforward referred to mainly as *the project*, was initiated to overcome these perceived shortcomings in the Finnish operating environment. Particularly, the project outlined the lack of international expertise and funding as a specific challenge for Finnish technology start-ups. The project was managed by Technopolis Ventures and funded by Tekes, the Finnish Funding Agency for Technology and Innovation, and was designed to support the growth and internationalization of ambitious high-potential Finnish start-ups by providing access to the best available resources in the form of expert services, target market penetration, and international venture capital cost-efficiently. The project was carried through from August 2006 to August 2008 and targeted Finnish start-ups that were very ambitious, had global market potential, operated in high-technology industries, and had a tangible product or service offering.

The application process into the project was two-staged. All applicants submitted written application forms and detailed business plans, after which the firms were invited to pitch in person to a panel of experts comprising of top executives and investors, who then evaluated each company based on the following five criteria: innovativeness, competitive edge, market access, team and scalability. The selection process was intended to identify the companies that had the greatest chances of succeeding internationally based on their team, business concept and targets. For the project itself,



ambitious targets were set. In the two year undertaking the project was mandated to find 60 potential start-ups, of which 20 were to commence or continue their internationalization during the timeframe by getting new funding, partners or customers from outside of Finland.

Of the 101 companies that applied 58 eventually participated in the project. Although 60 companies were initially admitted into the project, two left prior to using any of the provided services. The 58 companies that participated in the project are listed in **Appendix 1**. The project was open to firms from all industries, although the majority of the applicants and participants came from the ICT sector. The 58 participant companies were free to use the provided internationalization services according to their specific needs. The internationalization services were provided along three paths: Market Preparation, Market Access and Risk Investment.

The Market Preparation services included market research, drafting of international contract templates, intellectual property rights audits, as well as, preparation and fine-tuning of the firms pitch and presentation materials. The Market Access services composed of validating the product or concept of the firms in the target market, market entry planning, identifying and contacting potential customers and partners, target market business development and work on internationalization strategies. The Risk Investment path provided due diligence investigations, pitching events, preparation of investment memoranda, investor matching, advice on establishing subsidiaries, as well as, Entrepreneur in Residence type of services in the target market.

In total, the project engaged over 100 different external consultants and service providers to deliver the services. By the end of the project the value of the utilized services totaled €2.8 million. The most used services in terms of value are the €800 000 employed on local business development by 15 firms and the €370 000 put into the preparation of international contract templates by 32 participants. The market entry planning and target market validation were used for over €300 000 each, while the investor matching and the due diligence inquiries were used for €250 000 altogether. The firms used €48 000 on the internationalization services on average, with the most

active users utilizing over €150 000 worth of services and the least active taking advantage of only a few thousand euro's in services.

The project reached and exceeded its initial targets as over 20 of the participant firms gained new customers, new partners, or equity funding from abroad. Over 20 companies were able to gain new customers and partners during the project, while 15 firms received equity-based funding totaling more than €40 million combined from international and Finnish VCs, corporations, and angels over the two year period. Four companies were able to hit all three of the targets, getting new partners and customers, as well as, attracted risk funding during the project. These firms were Eniram, Imbera Electronics, PlexPress, and Xtract.

The present research is a follow-up study on the post project performance of the companies that applied to the project 5-years after its conclusion. The present study aims to quantitatively evaluate the impact of the project and its configuration, as well as, the external factors of equity-based funding, venture capital and international social capital on the growth and internationalization of Finnish high potential and high technology start-ups. Technopolis Plc provided the topic for this study and granted access to all the original material from the application process and the project itself. The attained findings can be used to evaluate if and how potential future public internationalization support projects or initiatives should be designed, as well as, the expediency of the identified factors and their impact on the post project performance of the applicant firms.

### **1.1 Research gap and problem**

Although literature on the early and rapid internationalization of start-ups has developed significantly over the past decades across various academic disciplines, especially in the fields of entrepreneurship and international business research, various streams of inquiry remain unfulfilled or have evolved since (Zahra, 2005; Gabrielson and Kirpalani, 2012). The divergence of the growth and internationalization trajectories perceived in Born Globals from the expansion processes of conventional firms has been well versed to date (Oviatt and McDougall, 1994). Plentiful research has also been

directed towards understanding the underlying reasons for the emergence of Born Global firms (Madsen and Servais, 1997; Laanti Gabrielsson, and Gabrielsson, 2007). Furthermore, the entrepreneurial, managerial, and resource related factors contributing to the success and demise of Born Global firms have been extensively reviewed (McDougall, Shane, and Oviatt, 1994; Mudambi and Zahra, 2007). However, despite the copious literature covering phenomenon, its causes, and factors contributing to initial success, literature on the subsequent development of these companies is still lacking (Zahra, 2005; Luostarinen and Gabrielsson, 2006).

In particular, research on the impact of equity-based funding, venture capital and social capital on the growth and internationalization of Born Globals is scant. More so, the empirical application of venture and social capital theories into the study of Born Global performance is limited, despite being included in the theoretical underpinnings relatively well. Also, quantitative studies on the performance of start-ups in their expansion efforts remain scarce. These prior studies have also struggled in providing timely findings as a large portion of the analyses are based on rather well aged data in an ever-changing business setting. To partially cover this gap in international business literature, this research focuses on answering the specified research problem:

*Can equity-based funding, venture capital, international social capital and public internationalization support explain differences in the growth and internationalization of aspiring Born Global firms through assisting them in overcoming their inherent resource challenges?*

## **1.2 Research objectives and questions**

The objective of this research is to measure and evaluate the influence of various factors, namely the impact of public internationalization support, equity-based funding, venture capital and international social capital, on the growth and internationalization of Finnish Born Global ventures. To analyze the impact of these specified factors, extant literature on the influence of these factors, the Born Global type of firm, and the growth and internationalization of SMEs and start-ups is reviewed. Based on the covered literature hypotheses are derived to test the impact of the identified factors contributing

to successful growth and internationalization of start-ups. The results of the quantitative analysis are used to determine whether statistically significant relationships can be inferred from the sample to the population of similar technology-based new ventures in Finland. Finally, conclusions on the impact of each individual factor on the growth and internationalization of the Finnish technology-based start-ups are adjudged from the outcomes of the empirical analysis.

To fulfill the aforementioned research objective, the forthcoming research will aim at answering the following overarching research question.

*What is the impact of the external factors of equity-based funding, venture capital, international social capital and public internationalization support on the growth and internationalization of Finnish technology-based start-ups with global aspirations?*

### **1.3 Definitions**

**Born Global (BG):** “A business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries (Oviatt and McDougall, 1994, p.49).”

**Private Equity (PE):** “Professionally managed equity investments in the unregistered securities of private and public companies (Fenn, Liang, and Prowse, 1997, p. 4).

**Social Capital:** “The actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit (Nahapiet and Ghosal, 1998, p.243).”

**Venture Capital (VC):**” Independent, professionally managed, dedicated pools of capital that focus on equity or equity-linked investments in privately held, high growth companies (Gompers and Lerner, 2001, p.146).”

## **1.4 Limitations**

This research is limited to the quantitative analysis of the 61 remaining independently operating Finnish technology-based start-ups that applied to the project in between August 2006 and August 2008. The findings that are made regarding the effect of the internationalization support provided by the project, equity funding, venture capital, and international social capital on the growth and internationalization of the applicant companies is only considered an accurate representation of this specific sample. Moreover, all subsequent inferences can solely be considered applicable to comparable technology oriented start-ups originating and vying to expand abroad from Finland. As such, the conclusions that are made may not be pertinent to other types of start-ups, SMEs or firms from Finland or other small and open economies (SMOPECs). The specific timeframe and the specific business environment during which the project executed may also limit the precision of the conclusions to similar firms from different eras. In addition, as a quantitative study, the research only takes into account the obtained numerical data in assessing the impact of the various factors on firm growth and internationalization, potentially excluding a multitude of qualitative reasons behind the success and failure of individual firms.

## **2 LITERATURE REVIEW**

This literature review covers the diverse theoretical backgrounds of the present entrepreneurial and international business research in order to provide a better understanding and assist in the analysis of the early expansion and internationalization of Finnish start-up ventures. The reviewed literature is divided into three primary themes. First, the various theories and existing research on the early and rapidly internationalizing start-ups is covered. The second part of the literature review focuses on the various theories traditionally incorporated into the study of new venture growth and internationalization, as well as, how they fit into contemporary Born Global theory. In the third segment the concepts of external funding and the social capital are examined in more detail with an emphasis on their respective impact on start-up growth and internationalization. Finally, based on the reviewed research, the theoretical framework and hypotheses of this study are presented.

### **2.1 Born Global research**

Over the past two decades, the proliferation and prominence of companies that internationalize essentially from their inception has become a widespread phenomenon (Oviatt and McDougall 1994; Zahra, 2005, Rialp Rialp, and Knight, 2005). While conventional internationalization theories professed that companies expanded their operations abroad following a series of successive and incremental stages (Vernon 1966, Johanson and Vahlne 1977; Luostarinen, 1980), principally befitting the growth patterns of large mature corporations, empirical studies from the late 1980s onward started to perceive discrepancies in the internationalization processes of numerous SMEs (McDougall, 1989; Oviatt and McDougall 1994; Madsen and Servais 1997). To date, the amount and influence of such ventures has multiplied to the extent that these ventures can no longer be considered as deviations from the norm, but as one of the major forms of SME existence.

Early research on these rapidly internationalizing and globalizing companies developed near concurrently under various authors and academic disciplines as numerous companies fitting the description started to surface all across the globe (Zahra, 2005).

Among the plentiful empirical evidence were the studies by Welch and Luostarinen (1988) on the internationalization of English, Australian and Swedish SMEs, Ganitsky's (1989) research on the 'innate exporters' from Israel, the longitudinal study of four high-tech start-ups by Jolly, Alahuhta and Jeannet (1992), and the often cited 'Born Global' report by Rennie (1993) on the distinctive internationalization behaviour of young Australian companies. This increasing body of research suggested a clear discord between the traditional models of internationalization and the early and rapid international expansion of new ventures, leading to calls for the development of new theories and frameworks capable of explaining the emergent phenomenon (McDougall et al., 1994).

Since, the emergence and propagation of such rapidly internationalizing firms in numbers and affluence, numerous scholars have extended the empirical and theoretical research on the phenomenon across various academic disciplines (Zahra, 2005; Sasi, 2011). Particularly, research on the Born Global type of firm has been developed to length under three increasingly connected academic fields; international entrepreneurship, international business and international management (Gabrielsson and Kirpalani 2012). Because of its multidisciplinary background, research on the phenomenon has lacked a uniform theoretical frame of reference (Madsen and Servais 1997). Consequently, a variety of definitions and names have been used to describe this breed of companies digressing from the conventional internationalization models (Rialp, et al. 2005; Luostarinen and Gabrielsson, 2006). Two predominant labels, International New Venture (McDougall, 1989; McDougall et al. 1994, Oviatt and McDougall 1994) and Born Global (Rennie, 1993, Servais and Madsen, 1997; Knight and Cavusgil, 2004) emerged in the mid-90s from entrepreneurial and international business backgrounds respectively to represent rapidly internationalizing SMEs (Sasi, 2011). Several other monikers have also been used to exemplify the rapidly internationalizing new ventures and their variants in prior research, including: new technology-based firms, global start-ups, early internationalizing firms, born internationals, instant internationals, and high-technology start-ups, among others (Luostarinen and Gabrielsson, 2006). However, to date this breadth of interdisciplinary

research has largely amalgamated into one broad and interlinked field of study on the rapidly internationalizing company, customarily referred to as Born Global research (ibid).

True to its multidisciplinary past, various definitions have been ascribed to qualify similar sets of internationalizing SMEs. These definitions have employed both qualitative and quantitative measures to differentiate the rapidly internationalizing start-ups from other types of SMEs (Gabrielsson and Kirpalani, 2004), making the generalization and comparison of findings exceedingly challenging (Leonidou and Samiee, 2012). In the collective body of work, perhaps the most common definition associated with the Born Global type of company is the conceptual depiction of INVs introduced by Oviatt and McDougall (1994, p.49) in their seminal article ‘Toward a Theory of International New Ventures’ that defined “an international new venture as a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries. Similarly, Knight and Cavusgil (2004, p.16) typified Born Globals as “companies that from or near founding obtain a substantial portion of total revenue from sales in international markets.” In the complementary empirical work the quantitative measures for categorizing Born Global firms have primarily varied across two dimensions: the speed and the extent of the companies’ internationalization (Gabrielsson, Kirpalani, Dimitratos, Solberg, and Zucchella, 2008), utilizing such measures as the intervening time between firm inception and internationalization (McDougal et al. 1994), the share of non-domestic and outside of home continent revenues from total sales (Gabrielsson and Luostarinen, 2004), and a minimum number of catered countries or continents beyond the domestic market (Rennie, 1993, Gabrielsson and Luostarinen, 2004).

### **2.1.1 Emergence of Born Globals**

Although, Born Global companies have arguably existed for centuries, such instances used to be few and far between. Contrariwise, today Born Global firms have spread and propagated across the world, erstwhile becoming integral contributors to new economic growth. This proliferation that took place over the past decades corresponded with



significant global changes in the external business environment (Oviatt and McDougall 1995; Laanti et al., 2007; Gabrielsson and Kirpalani, 2012). In his exploratory work on the early Australian exporters, Rennie (1993, p. 48) documented that the bases of the phenomenon were located in the “dynamic interrelationships between changing consumer preferences, changing manufacturing and information technology, and changing competitive conditions.” Rennie (1993) recognized that SMEs encountered improved prospects in niche markets as consumer demand was becoming increasingly individualistic, technological progress, particularly in transportation, communications and computation, had made foreign markets more accessible, while electronic process technology enabled small companies to counter scale advantages in cost, quality and flexibility. Likewise, Oviatt and McDougall (1995, p.33) noted “the current and increasingly global nature of demand in many markets” as well as the “rapid and worldwide communication and transportation” as integral to the formation of Born Global firms. Moreover, Oviatt and McDougall (1995) conferred that not only did these forces enable the creation of Born Global firms, but conversely made the gradual and cautious patterns of conventional internationalization models precarious for a growing set of young SME companies.

Although, the globalization of demand and advances in technology are generally accepted as the most influential drivers of rapid internationalization, an extensive array of other coinciding macroeconomic shifts and market dynamics contributed to the escalation of the Born Global phenomenon. From prior literature, Laanti et al. (2007, p.1105) compiled an exhaustive rundown of the catalysts supporting the rapid internationalization of new ventures, which included: “falling trade barriers, deregulation and privatization, maturity in domestic markets, faster information flows, improved communication and transportation networks, social developments such as more homogenous consumer needs, tastes and values, globally standardized products, high technology investments that cannot be covered by sales in domestic markets only, combined with shortening product life-cycles, other economies of scale benefits, global sourcing of resources and ideas, globalizing competitors and competition, and free movement of capital goods, services, and people.”

In addition to the aforementioned array of contributing changes in the external business environment and technological developments, Oviatt and McDougall (1995) identified that the amount and skill of internationally experienced managers and human resources has considerably expanded and enhanced over the past half a century. Their ability in perceiving and taking advantage of international opportunities is considered as one of the most instrumental causes for the increased amount and influence of Born Global firms over the past two decades. Similarly, Madsen and Servais (1997) later emphasized the fundamental role of the past experiences, competences, and ambitions of the entrepreneurs in driving the creation of Born Global companies. Especially, the accrued international experience of the top management was seen to lessen the alleged psychic distance associated with foreign market entries (*ibid.*).

As these macroeconomic changes took place on a global scale, Born Global companies have been observed to emanate and exist across geographical and industry boundaries (Rennie, 1993). Particularly, Born Globals have been observed to surface in niche markets, where they compete against large multinationals, low-cost providers, and local firms on quality and value with innovative product and service offerings (Jolly et al. 1992). These niche opportunities have predominantly formed in business areas characterized by heightened research, development and managerial demands (Luostarinen and Gabrielsson, 2004). Accordingly, Born Globals have been above all identified in knowledge-intensive industries (Oviatt and McDougall, 1994). In the survey by Luostarinen and Gabrielsson (2006) Born Global firms were recognized to operate in high-tech, high-design, high-service, high-know-how and high-system business areas.

Moreover, Born Globals have been recognized to hail from all kinds of countries, with both large nations and small and open economies, such as Finland, being well represented (Luostarinen and Gabrielsson, 2004). However, the reasons behind the propagation of such firms in large and small markets differ to an extent. Whereas, Born Globals from nations with vast domestic markets are not pressed to internationalize early or rapidly by their national setting, start-ups from SMOPECs are pushed to internationalize fast and early because of their limited home market demand

(Gabrielsson and Kirpalani, 2012). With insufficient domestic demand the decision to internationalize for most SMOPEC Born Globals is not simply a matter of choice, but of necessity as well. Pertinently, Andersson and Wictor (2003) found out that Born Globals were indeed more likely to form in SMOPECs as opposed to larger nations due to the aforementioned demand driven push. Moreover, innovative Born Globals from small and open economies are also pressured to internationalize and gain foreign market share rapidly to succeed against the imminent competition of large market Born Globals and potential imitators (Gabrielsson and Kirpalani, 2012). This evident need for Finnish companies to attain sales from abroad was perpetuated into three similar slogans, which evolved from the 'Export or die' of the 1960s, to the 'Internationalize or die' in the 70s and 80s, and finally to 'Globalize or die' from the 1990s onward (Luostarinen and Gabrielsson, 2004).

### **2.1.2 Born Global characteristics**

Despite the numerous definitions and lack of a uniform framework, extant research on the topic has agreed upon some overarching characteristics representative of the Born Global firm. Arising from and common to the various definitions is the notion that Born Global firms operate internationally at a precocious age, thus differentiating them from the gradual expansion perceived in traditionally internationalizing firms. More commonalities are found in the various limitations Born Globals face because of their distinctive nature. As start-up firms that aim to conquer the world from the very onset, Born Globals are unequivocally viewed as being disadvantaged in their international expansion by factors relating to their comparative smallness, newness and foreignness (Zahra, 2005; Freeman et al., 2006).

Because of their typical smallness as start-ups, Born Globals are considered to possess fewer physical and knowledge assets in comparison to established competitors (Freeman et al., 2006). Consequently, such start-ups rarely possess the required resources to support their international expansion independently. This resource poverty is most often visible in the shortage of the financial, human and managerial resources necessitated by international expansion, thus adversely impacting a Born Global

company's ability to overcome the rigors associated with foreign market entry (Zahra, 2005). Similarly, the implicit young age of Born Globals places them in an unfavourable position in comparison to their already established competitors. Because of their newness Born Globals are generally perceived to lack legitimacy in the eyes of external actors, thus restricting their access to complementary resources and professional networks early on (ibid). As newcomers in foreign markets, Born Globals are also bereft of international experience and location specific knowledge, which can obstruct Born Globals in launching their operations abroad.

Finnish Born Globals are also faced with challenges stemming from their small domestic market. The accessible pool of resources is significantly smaller for SMOPEC Born Globals in comparison to their large market counterparts. In Finland, as well as other small economies, the availability of the required financial and managerial resources is limited, which can inhibit start-up internationalization (Gabrielsson and Kirpalani, 2012). Not only does the lack of home grown managerial talent and available funding impede the internationalization prospects of these companies, SMOPEC start-ups are pushed to internationalize in order to gain access to the funding and managerial benefits that larger markets can offer. Although, researchers and government officials in Finland have duly noted the lack in venture funding and international managerial capabilities, these shortcomings remain at the core of the challenges to the rapid and early expansion of ambitious Finnish start-ups (Maula, Murray and Jääskeläinen, 2007). Although, start-ups with large domestic markets are not pushed to internationalize the way SMOPEC Born Globals are, the global market potential acts as a significant pull towards pursuing early and rapid expansion as well. From their interviews, Oviatt and McDougall (1995) recollected that Born Global founders considered that "the best domestic defence might be a superior international offense." Despite being uniformly named, Born Globals emanating from small and big economies in fact vary considerably not only in their challenges and motives, but also in their size and affluence when internationalization takes place.

Regardless of their nation of origin, authors have posited numerous factors and characteristics both internal and external to the organizations that enable Born Globals

to form and to succeed. Various scholars have agreed that Born Globals are able to compete with the established competition through such factors as; having a global vision from the start, having an innovative or highly advanced solution to sell, following with complementary or closely linked products or services, and being able to closely coordinate organizational activities and communications internationally (Jolly et.al., 1991; Oviatt and McDougall, 1995). However, the most notable characteristic behind the widespread propagation and success of Born Global firms is considered to abide in the individuals responsible for their creation. Unlike, domestic entrepreneurs, the founders of Born Globals are able to perceive unfulfilled opportunities on a global scale and enact on them before anyone else can. This ability to see and exploit global market opportunities derives from their distinct international backgrounds in multinational organizations preceding the formation of the firm (Oviatt and McDougall, 1995). From their distinctive international business backgrounds these entrepreneurs are able to communicate a global vision, build on their inimitable knowledge and possess international networks and connections to aid and advance the early and rapid internationalization.

### **2.1.3 New venture internationalization**

Internationalization, one of the primary strategies for achieving organizational growth, has become a focal theme of study across and within various disciplines of economic research (Luostarinen, 1980). Since first attracting the attention of academicians in the 1950s, various models and theories have been developed to explain the internationalization process of companies (Sasi, 2011). Among the initial constructs explaining the internationalization process of companies where such international business models as the monopolistic advantage theory, the product life cycle theory, oligopolistic reaction theory, internalization theory and the several stage models of internationalization (Oviatt and McDougall, 1994; Madsen and Servais, 1997; Young, et al., 2003). Pervasive in this body of work was the mainstream perspective of internationalization, which advocated that firms initially commenced operations in their home country and from there on ventured abroad in a gradual and sequential manner, starting from neighboring markets and only then proceeding further (Luostarinen,

1980). Near unequivocally, these theories were derived from examining the internationalization processes of established MNCs that dominated the global business landscape for the better part of the past century (Zahra, 2005). From amongst these theories, the traditional stages models of internationalization (Johanson and Vahlne 1977; Luostarinen, 1980) and the network perspective of internationalization (Johanson and Matsson, 1987; Freeman et al., 2007) became the prevailing theories in the study of SME internationalization and the subsequent background for the impending Born Global research (Coviello and McAuley, 1999; Young et al., 2003).

The conventional stage models of internationalization evolved from independent work conducted in Sweden, Finland, and the United States over the late 1960s and throughout the 1970s, which research resulted in three distinctive process-oriented theories of internationalization, namely the Uppsala model, the Helsinki or holistic POM-model, and the innovation-related models (Sasi, 2011). The most renowned model of the three, the Uppsala stages model of internationalization, suggested that a company “first develops in the domestic market and that the internationalization is the consequence of a series of incremental decisions (Johanson and Wiedersheim-Paul, 1975, p. 306).” In the Uppsala stages model the primary constraint to a company’s foreign expansion was its lack of assets and market knowledge that needed to be developed before expanding abroad. To transcend this obstacle, the model advocated that companies accumulated the requisite resources and market knowledge through experiential learning over time (Johanson and Vahlne, 1977).

Similar research on the internationalization process of the firm also took place in Helsinki. This study led by Luostarinen (1980) resulted in the Helsinki or POM model of internationalization. The initial model presented by Luostarinen and his colleagues slightly resembled the constructs conjured by their Swedish counterparts in Uppsala, as both leaned heavily on the behavioral theory of the firm and the Penrosian resource-based perspective (Penrose, 1959; Cyert and March, 1969). Akin to the Uppsala model, the Helsinki model proposed a sequential learning-based approach to the foreign expansion of companies. However, contrary to the Uppsala model where companies needed to accrue market specific knowledge to successfully internationalize,

Luostarinen and his peers advocated that experiential knowledge of the internationalization process itself was required instead (Luostarinen, 1980).

The innovation-related or I-models of internationalization were developed by various scholars in the United States over the same epoch as when the Nordic stage models were devised (Gankema, Snuif, and Zwart, 2000). However, unlike the Nordic models that covered the internationalization of firms from indirect exporting to foreign direct investment, the formulated innovation-related models focused solely on the successive stages of export activities (Ruzzie, Hisrich, and Antoncic, 2006). Although the number of proposed stages varied in the different innovation-related constructs, Leonidou and Katsikeas (1996) identified three overarching phases crudely classified as pre-export, initial export and advanced export in all of them.

Nonetheless, one of the mainstays of Born Global research has been its contradictory position towards the traditional models of internationalization. Especially, Born Global research has critiqued the incremental and learning-based approaches advocated by the mainstream perspective of internationalization and the traditional stage models in explaining the early and rapid expansion of Born Globals (Oviatt and McDougall, 1995). Hence, the primary dispute has not been about the identified internationalization stages, but the age and speed at which these stages can be accomplished or even bypassed. On top of the criticism directed at the conventional stage models of internationalization, other traditional international business constructs used to explain the internationalization process of companies, such as the monopolistic advantage theory, the product life cycle theory, oligopolistic reaction theory, and internalization theory have also been deemed insufficient in their ability to explain the internationalization of Born Globals (Oviatt and McDougall, 1994; Madsen and Servais, 1997; Young et al., 2003).

Another theory often used to explain the successful internationalization of SMEs is the network perspective of internationalization (Freeman et al. 2006). In preliminary research on the network theory, Johansson and Mattsson (1987) examined the formal business connections of industrial organizations and how these firms manoeuvred to

improve their standing within the network. In this industrial network context network involvement was seen as cumulative process, in which “relationships are constantly being established, maintained, developed, and broken in order to give satisfactory, short-term economic returns and to create positions in the network that will assure the long-term survival and development of the firm (Johanson and Mattsson, 1987, p. 36).” In the recent and more inclusive research on SMEs network dynamics, Freeman and Cavusgil (2007, p.7) simply pointed out that the “major function of a network is to provide contacts that can be used when they are required by the firm, such as when entering a new market.” Hence, internationalizing firms are expected to invest into developing their international networks in order to acquire the needed resources and capabilities for expanding and succeeding abroad.

Although, network relationships have been identified to evidently expedite the internationalization of SMEs, the ability of the network theory in explaining the early and rapid international expansion of Born Globals has been questioned (Oviatt and McDougall, 1995). As the network perspective of internationalization focuses primarily on formal business connections, the building and strengthening of organizational relationships is regarded as a gradual and cumulative process that requires significant time and effort to complete (Madsen and Servais, 1997). Hence, because of its limited scope of a firm’s network, the network perspective does not take into account the significance of the social connections of key personnel, especially the pre-existing networks of the founders, in the early and rapid internationalization of Born Globals (McDougall et al. 1994). With all business transactions essentially transpiring in a social setting (Granovetter, 1985), contemporary internationalization research has moved to extend the network perspective with social capital theory, thus effectively expanding the scope of a firm’s network to also encompass the informal and social connections a firm has in its reach (Adler and Kwon, 2002; Sasi and Arenius, 2008).

## **2.2 Factors influencing Born Global performance**

Of the various innate limitations faced by Born Globals in their early expansion, the copious lack of financial and knowledge resources are considered as key inhibitors to



achieving desired growth (Freeman et al., 2006). Because traditional internationalization theories advocate a gradual approach to accruing the necessary financial and knowledge resources through either experiential learning (Johanson and Vahlne, 1977; Luostarinen, 1980) or participative network development (Johanson and Mattsson, 1987), these frameworks are unable to explain the immediate expansion of Born Globals (Oviatt and McDougall, 1994). Hence, research on the early and rapid internationalization of new ventures has sought to identify other models for explaining how Born Globals come to possess the needed resources and capabilities that they are inherently considered to lack. The following segment discusses how external financing, venture capital in particular, and social capital impact a Born Global firm's ability to overcome resource challenges along its growth and internationalization trajectory.

### **2.2.1 External funding**

As mentioned, entrepreneurial companies rarely possess the required capital to finance their desired growth (Gompers and Lerner, 2004). Particularly, technology oriented and knowledge-intensive start-ups that are generally characterized by elevated research and development endowments are considered to be unable to internally finance their growth (McCann, 1991). Furthermore, the capital needs of firms vying for early and rapid internationalization are considerably exacerbated (Freeman et al., 2006). Gabrielsson, Sasi and Darling (2004, p.593) highlighted the significant financial strains to Born Globals declaring that, "Rapid globalization is expected to put extremely high pressure on organizing financial resources for a faster, deeper, and more expansive global commitment." To transcend these excessive monetary demands associated with a global strategy, Born Globals almost unequivocally need to rely on external sources to finance their expansion.

To fulfil this need, a variety of external financing options have been instituted to finance start-up growth. However, for reasons pertaining to their new venture disposition, traditional capital markets or debt financing alternatives, such as bank loans and issuance of public stock, are often unattainable (Gompers and Lerner, 2004). Because of their newness and smallness, the availability of funding alternatives for start-up firms

are limited by such factors as “uncertainty, asymmetric information, the nature of the firm assets, and the conditions in the relevant financial and product market,” according to Gompers and Lerner (2004, p.157). Consistently, Botazzi and Da Rin (2002, p. 234) argued that in relation to start-up funding “three practicable options remain: convincing a ‘business angel’ to invest, finding an established industrial company interested in the project, or going for a venture capitalist.” These three forms of so-called risk investment are also considered as superior in fostering new venture growth in comparison to traditional debt financing means because of the distinctive nature of the contract between the investing and the invested parties. Financial scholars have devised various rationalizations as to why debt financing is a sub-optimal contract for funding new entrepreneurial ventures (Admati and Pfleiderer, 1994). Thus, venture or equity investments characteristically do not come in the form of traditional loans, but take the form of convertible securities that concurrently prompt the entrepreneur to perform proficiently, while enabling the investor to seize control of the firm if performance targets are not met (Botazzi and Da Rin, 2002). In this form of financing the investor gains an equity stake in the company that encourages it to provide non-financial or so-called ‘soft’ support in the form of monitoring and mentoring to supplement the financial or ‘hard’ contributions (ibid). In this type of contract the investors own return on investment is tied to the company’s growth and eventual exit.

### **2.2.2 Venture Capital**

Of the outstanding equity-based financing options, independent venture capital is widely recognized as the most beneficial form of funding available for innovative high-tech start-ups (Botazzi and Da Rin, 2002). Venture capital as a distinctive form of financial intermediation is considered to have started in 1946 with the foundation of the American Research and Development (ARD) Corporation (ibid). In general, venture capital is considered to play a critical role in the early stages and consequent development of new ventures (Hellmann and Puri, 2000), with existing research suggesting a positive relationship between venture capital funding and firm growth (Bertoni, Colombo, and Grilli, 2011). Although, these findings have been somewhat indefinite (Botazzi and Da Rin, 2002), venture capital financed companies have been

found to grow faster, patent more and display enhanced productivity compared to their non-venture capital backed counterparts (Croce, Martí, and Murtinu, 2013).

Prior research has identified various reasons as to why the performance of venture capital backed firms is superior to their non-venture capital funded counterparts (Davila, Foster, and Gupta, 2003). First, as professional investors investing their partnerships funds, venture capitalists are considered to devote significant time and effort into understanding technological and market developments, enabling them to detect promising investment opportunities (Botazzi and Da Rin, 2002). On the topic, Croce, Martí, and Murtinu (2013, p. 491) posited that, “VCs are recognized as agents that are better able to address information asymmetry problems than other financial intermediaries, especially when investing in unlisted firms.” This diligent screening and selective investing has been referred the venture capitalists ability to find the firms with the highest potential or select the so-called ‘winners’ (Laanti et al. 2007).

On top of selecting the most promising ventures to fund, venture capital firms have been assumed to bring value-adding financial and non-financial support to their portfolio companies. These value-adding activities by venture capitalists are seen as their ability to construct winners (Bertoni et al., 2011). After investing venture capitalists provide their portfolio companies with various non-financial provisions and performance incentives alongside their capital endowment (Sahlman, 1990). This non-financial side of venture capital has been identified as crucial to the success of these new ventures, as they provide the companies with business expertise and access to business networks, both of which are often perceived to be lacking in the new technology-based ventures (Botazzi and Da Rin, 2002). Venture capitalists provide this support by taking active roles in the governance of their portfolio firms, either through direct participation in the board of directors or through informal managerial involvement (Sahlman, 1990). By monitoring and mentoring their portfolio ventures, venture capitalists are able to use their expertise to provide value for example in shaping strategies, setting objectives, incentivising performance, and recruiting, alongside their financial inputs (Croce et al., 2013).

Furthermore, venture capitalists are also considered to provide benefits for their portfolio ventures through their networks of connections and reputation. By gaining access to the normally extensive networks of their investors, portfolio firms can receive contacts to potential suppliers, customers, infrastructure providers, and experienced managers that would otherwise be out of their reach (Davila et al., 2003). The inferred reputation benefit from the venture capitalists endorses the technology and team behind the product or service, providing extra legitimacy in the eyes of unacquainted third parties helping them to generate more sales and attract better talent as well (Botazzi and Da Rin, 2002). However, although the relative distribution of importance amongst screening and value-added services is unclear, both of them are generally considered to contribute beneficially to the comparative success of the investments by venture capital firms.

### **2.2.3 Angel, corporate and public funding**

While in theory both angel and corporate investors can provide similar non-financial benefits to their portfolio ventures, the impact of independent venture capitalists on firm growth has been often considered as superior. As wealthy individuals investing their own capital, angel investors are on average considered to be limited in terms of their total assets, expertise, experience, and external network connections in comparison to the pooled resources of venture capital organizations. These smaller angel investments often precede true venture capital rounds in the seed stage of a business (Wetzel, 1983). Although characterized by significant heterogeneity, angel investors are usually considered to be less active than independent venture capitalist firms in monitoring their investments or exercising control over the firm (Fenn et al. 1997).

Although, not restricted in terms of capital, industry experience, or networks in comparison to independent VCs, the suitability of corporate venture capital as investors in start-ups has been debated. In addition to seeking similar financial gains as their independent venture capitalist counterparts, corporate investors tend to look for strategic complementarities that bring about indirect gains. According to Gompers and Lerner (2000, p. 19) in cases where a strategic overlap exists “corporate venture investments in

entrepreneurial firms appear to be at least as successful as those backed by independent venture organizations.” However, in investments without strategic implications, the performance of corporate investors has been observed to be clearly inferior (ibid). This strategic overlap has also been identified as a potential impediment from the portfolio firm’s point of view, as conflicts of interest can form between the strategic decisions of the parent corporation and the new venture. Furthermore, the incentive structures instituted by corporate investors have been identified to be less suitable for supporting start-up growth than the strong incentive-laden compensation structures implemented by independent VCs (Sahlman, 1990). Also at times the relationship between a corporate investor and a start-up has been observed to resemble the rapport of a parent firm and its subsidiary more than that of two independently run organizations (Gompers and Lerner, 1998).

In Finland, the funding of highly ambitious and growth oriented start-ups remains a challenge, even though the availability of seed and early stage financing for start-ups has improved significantly in the 2000s with governmental and semi-public organizations such as Tekes, Finnvera, Finnish Industry Investment, and Sitra filling in the funding gap during the formative stages of start-up development. However, the subsequent funding for growth and internationalization is still evidently lacking, especially from private sources (Maula et al., 2007). Particularly, the limited capital and the stagnant development of the Finnish and European venture capital market has been viewed as a constraint to Born Global development, as funds across continental and northern Europe continue to struggle in raising funds from institutional investors (ibid). Moreover, the capacity of public funding in supporting the growth and internationalization of start-ups with global aspirations has been contested, as governmental investors are generally inclined to be less involved, have less effective incentivizing means, as well as, less time and resources to allocate to each individual start-up (Knockaert, Lockett, Clarysse, and Wright 2006). Subsequently, the effect of public funding on start-up performance is considered to be smaller in comparison to the impact of independent venture capital, corporate investments, and angel funding at an aggregate level.

#### **2.2.4 Social Capital**

As stated by the networking theory, start-ups can overcome resource scarcity and other challenges related to their relative smallness, newness and foreignness by accessing the required resources and capabilities through their external network of connections (Sasi and Arenius, 2008). However, due to the network theories initial focus on formal business connections and its gradual view on network development, the networking model has been deemed incapable of explaining the instantaneous and rapid international expansion of Born Global firms. It has been suggested that the theory of social capital should be employed or incorporated instead, because its more expansive view of a firm's network provides a more apt explanation for the Born Global firm's premature access to external resources and capabilities.

Basing on social-network theory, Social Capital theory views the networks of relationships of individuals or social units as beneficial resources for the performance of social activities (Arenius, 2002). Though abstract in nature, social capital is considered to be a property of an individual or a group that enables them to attain something inaccessible to them otherwise (Nahapiet and Ghoshal, 1998). Burt (2000, p. 347) condensed the entire concept of Social Capital into the straightforward notion that "Social capital is the contextual complement to human capital", in which, "The social capital metaphor is that the people who do better are somehow better connected."

In business research social capital has often been viewed as either the quantity or the quality of the ties an organization has at its behest. In the first line of enquiry, social capital has been viewed as the number of formal and informal connections (Baker, 1990), wherein the more connections a firm has, the more social capital it possess, which in turn would translate into greater advantage for the company. The other stream of study on social capital has focused on the quality of the ties over their quantity, with differences in the strength of the relationships providing an explanation for inter-firm performance differences (Nahapiet and Ghosal, 1998). This view proposes that because of the differences in the relational aspects of social interactions, companies with stronger ties possess greater trust, cooperation, and legitimacy amongst them (ibid). However, as both explanations have their merits, it has also been suggested that social

capital and its advantages do not solely come from one or the other, but from the combined quantity and quality of the network connections that a firm possesses (Arenius, 2002).

For a company to have social capital it must possess external relationships (Arenius, 2002). Indeed, all organizations, due to their human component possess some amount of social capital. Although, firms may possess similar network ties, the social capital embedded in these linkages is not equal and can vary greatly. “In addition, a large number of social ties does not necessarily translate itself into social capital. It only does so if these ties assist the actor in the attainment of particular goals (Arenius, 2002, p. 52).” Furthermore, as social capital is entrenched in the interaction and relationship of the involved parties, social capital does not belong to any one organization, but to the two organizations as a jointly owned property (Burt, 1997). Hence, if the relationship between the two parties is dissolved, the social capital rooted in that connection will disband. Because of the mutual ownership, social capital is considered very difficult or even impossible to transfer from one party to another (Nahapiet and Ghoshal, 1998).

As a jointly owned bond between two actors, social capital has been identified to comprise of three distinct dimensions: the structural, the relational and the cognitive dimensions (Nahapiet and Ghoshal, 1998, p. 243). The structural dimension is represented by the impersonal connections and their configurations that link one actor to another, largely akin to the network illustrated in the networking theory. The relational dimension of social capital is understood as the particular relationship that characterizes the behaviour of the involved parties. In essence, this dimension takes into account the particular traits, such as trust, friendship, and respect that influence the norms, obligations and conduct of the actors in each individual relationship (ibid). Finally, the cognitive dimension refers to the “shared representations, interpretations, and systems of meaning among parties (Nahapiet and Ghoshal, 1998, p. 244).” According to Arenius (2002, p. 55), these cognitive properties enable “the common understanding of collective goals and of proper ways to interact with one another.”

Furthermore, when a company operates outside its domestic boundaries, the firm by default will possess some international social capital. International social capital can be defined as the quantity and quality of the external ties that an organization has to international parties or internationally active domestic contacts (Arenius, 2002). While, domestic social capital assists in the acquisition of resources in the firm's domestic setting, international social capital enables the international expansion of a company. Generating and nurturing these international ties is considered to be more difficult than accruing and maintaining domestic ones. This additional difficulty results from factors related to the physical, cultural and economic distances between nations, with language and legislation being the two most obvious differences in most instances. Thus, for businesses to be considered as Born Global they must possess social capital already at the time of their foundation or very quickly thereafter. Although, it has been thought that Born Globals would be void of substantial international ties due to their newness and foreignness, existing research has identified that the founders behind successful Born Globals in fact typically have prior international business experience and consequent international social capital that predates the firm's foundation (Oviatt, et. al., 1995; Sasi and Arenius, 2008).

### **2.2.5 Social Capital in start-ups**

When established, the entrepreneurs and their firm are practically joined at the hip (Casson, 1996). Hence, as highlighted by prior entrepreneurship research, the social capital of a firm is initially that of the company's founders (Arenius, 2002). Furthermore, not only do the entrepreneurs build their firms subsequent network of connections, they also bring their personal and prior business ties with them to the newly established venture (Hite and Hesterly, 2001). The role of these personal connections is at its highest during the ventures formative stages as the firm itself lacks the formal business connections, as well as, the reputation and recognition to attract such connections on its own. At the start, new ventures rely on their founders interpersonal relationships, which can form into formal interorganizational connections as the collaboration evolves (Arenius, 2002). However, although vital at first, once the company seeks to grow beyond its initial reach, the interpersonal social capital of the



founders is often considered as being insufficient in providing the elevated resources necessitated by the further expansion (ibid).

As social capital is inherent to individuals and organizations, the total social capital of an organization in theory is the collective sum of social capital imparted by all of its employees and not only that of the entrepreneurs or top management (Penning, Lee, and Van Witteloostuijn, 1998). Because the social capital of the organization is entrenched in the connections of its employees, firms are able to extend or diminish their social capital through hiring and firing employees (Arenius, 2002). However, in practice the social capital of the executives and top-level decision makers in a firm constitutes the majority of the external connections that are utilized, while the influence of the linkages possessed by lower level employees is usually relatively marginal (ibid). In addition to the founders, prior research has identified that firm governance is directed and enacted in one form or another by some composition involving the CEO, the Board of Directors, and equity investors (Lerner, 1995; Sasi and Arenius, 2008). Thus, the collective quantity and quality of the ties possessed by this identified top management team is of interest when studying the impact of social capital on firm performance.

To attain successful early and rapid internationalization, Born Global firms must possess enough international social capital in order to overcome their inherent limitations in foreign settings. As mentioned, the international experience and connections of the founders is critical during the initial expansion, whereas, for the company to scale its operations internationally, additional international social capital is needed (Sasi and Arenius, 2008). At this stage the international networks and relationships of the top management team outside of the founders is decisive. Effectively, the more and better heterogeneous international connections and relationships a firm has through its founders, CEO, board, and investors, the more international social capital it possess, which in turn should facilitate foreign market entry and especially subsequent international growth (Arenius, 2002).

### **2.2.6 Advantages of Social Capital**

The primary benefit of social capital is that it provides individuals and units with access to resources and opportunities that they would otherwise be devoid of. Thus, for the inherently resource challenged rapidly internationalizing new ventures, the possession and accumulation of social capital, particularly international social capital, can be considered paramount. On the theme, Nahapiet and Ghoshal (1998) posited that inter-firm differences in performance can be explained by the capacity of an organization to generate and exercise its social capital. The potency to harness external resources to a firm's benefit is one of the key abilities of entrepreneurs as they strive to build more from less. Basing on prior literature on the topic, Arenius (2002, p. 66) summarized that "studies on networks and entrepreneurs argue that entrepreneurial networks provide with resources and information, and efficiency in accessing these factors should contribute to venture start-up, growth, and performance."

With the relative lack of knowledge and physical resources in comparison to established firms considered as one of the primary obstructions to successful new venture internationalization, international social capital has been identified as a potential means by which some companies are able to supersede their resource limitations and bridge the resources gap in an international setting (Karagozoglu and Lindell, 1998; Arenius, 2002). Unsurprisingly, the international connections of a company have been viewed as conducive to the accrual of physical and financial assets, market knowledge, and the right contacts (Jarillo, 1989). Another limitation often faced by Born Globals early on is their insufficient credibility and reputation in the eyes of the resource providers and established actors. By large firms are more likely to cooperate with actors that have already demonstrated their ability and reliability in relationships with other partners (Stuart, Hoang, and Hybels, 1999). For new ventures, both in the home and foreign markets, social capital can reduce this gap in legitimacy through the endorsement of an already established party. In these situations, social capital aids in both the identification of potential resource providers as well as gaining access to them, even though the parties do not have any common history together at that point (Arenius, 2002).

Furthermore, even without the implicit backing of another party, the social capital embedded into one relationship can be advantageous in dealings with unacquainted third parties as well. This process founded on social embeddedness theory has been called ‘network transitivity’ and “refers to the mechanism by which a focal actor gains competencies and resources from one network tie that improves the value the actor derives from exchanges with an independent third relation (Uzzi and Gillespie, 2002, p. 596).” Hence, network transitivity is considered as an advantageous spill over that companies attain from one relationship to another. Moreover, a company’s network is also deemed to be cumulative in nature, wherein the existence of an eminent partner can assist in the accrual of additional prolific connections (Stuart et al. 1999). Regardless of the company’s age, when venturing abroad having the reference or endorsement of an established member of a specific business environment is essential for gaining entry into that specific and pre-existing business network (Arenius, 2002). Arenius (2002) also discovered that, *ceteris paribus*, an increase in the social capital of firms elicited positive impacts in regards to successful foreign market entry, the speed of internationalization, the scope of the international expansion, and the subsequent international growth of the studied internationalizing new ventures.

## **2.3 Theoretical frame of reference**

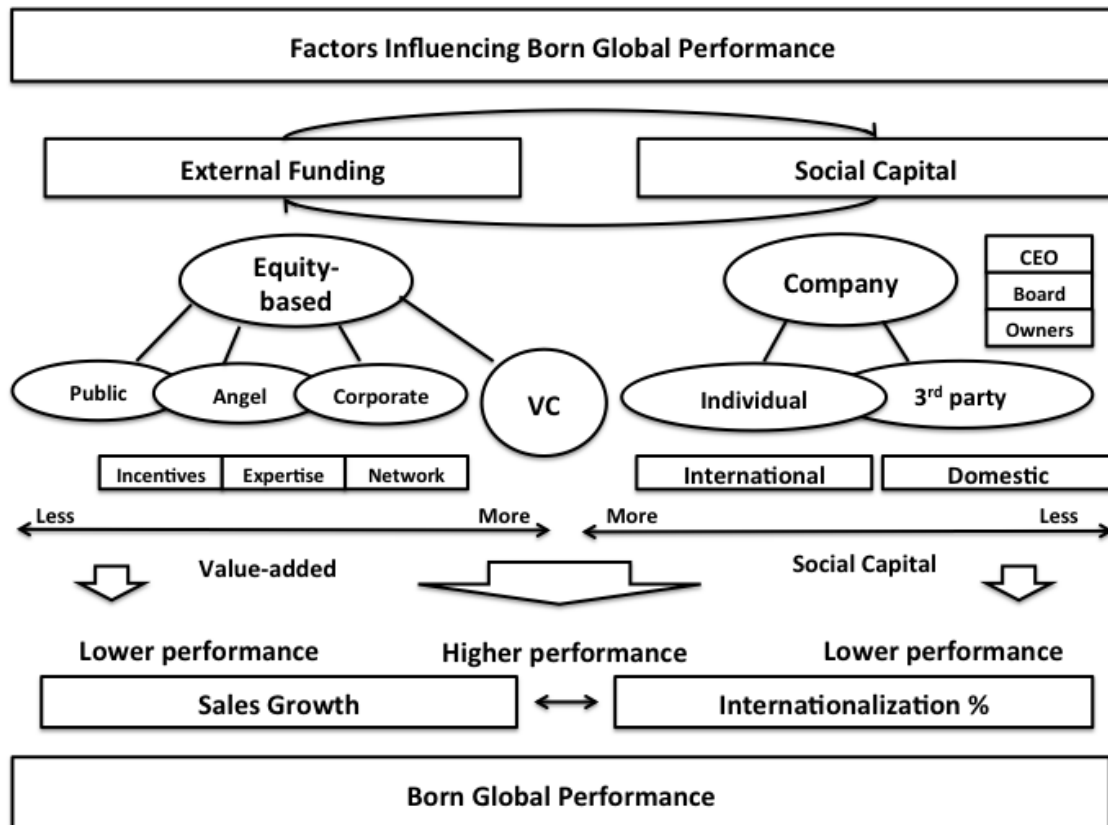
This chapter introduces the theoretical framework of the present study based on the above reviewed literature. First the main theoretical underpinnings are summarized and an overall theoretical frame of reference is derived from them. Then, from the covered multidisciplinary research, hypotheses on the impact of the Born Global project, external funding, and social capital are formed to fulfill and answer the set research objective and question.

### **2.3.1 Factors influencing Born Global growth and internationalization**

As discussed, one of the liveliest topics in internationalization research over the past decades has been the widespread propagation of Born Global firms, which despite being faced with numerous challenges as recently established business entities are able to overcome the odds and succeed at a remarkable rate. From amongst the various

hindrances characteristic to their age, size and foreign disposition, the copious lack of financial and knowledge resources have been viewed as two of the key inhibitors to new venture growth and internationalization (Freeman et al., 2006). Whereas, traditional internationalization theories advocated a gradual approach to accruing these necessary financial and knowledge resources through experiential learning (Johanson and Vahlne, 1977, Luostarinen, 1980) and participative network development (Johanson and Mattsson, 1987), these proposed frameworks are not able to sufficiently explain the immediate and expansive expansion perceived in Born Globals (Oviatt and McDougall, 1994). Thus, subsequent research on the early and rapid internationalization of start-ups has sought to identify the divergent means through which Born Globals come possess the needed resources and capabilities that they are inherently inclined to lack. **Figure 1** illustrates the contrived theoretical framework for examining the impact of external funding and social capital on the growth and internationalization of Born Global firms.

**Figure 1: Framework of Born Global growth and internationalization factors**



The framework above details the anticipated impact of the factors of external funding and social capital, as well as, their various features and components on the growth and internationalization of Born Global firms. The external funding factor consists of the identified four sources of equity-based funding and shows their comparative value-added impact on new venture growth and internationalization. In alignment with prior research, independent venture capital funding is considered to provide more value-added benefits, such as better incentive structures, superior expertise in screening and supporting start-ups, as well as, more extensive networks of connections than funding from other types of equity investors, namely corporate, angel or public (Botazzi and Da Rin, 2002; Croce et al., 2013). This improved value-added benefit is subsequently assumed to result in higher sales growth and internationalization performances on average for venture capitalist backed ventures.

Similarly, the social capital factor looks at the beneficial connections at a firm level by taking into account the social capital possessed by the companies top management team, consisting of the CEO, the Board of Directors and equity owners of the firm. The firms' social capital is categorized into the connections and relationships individual to the firm, as well as, contacts and leverage gained from outside actors and third parties, including public internationalization support. As attested in the covered theory on social capital, firms with more social capital are better positioned to take advantage of market opportunities and accrue the needed resources (Nahapiet and Ghosal, 1998). Moreover, this combined social capital of a firm is further distinguished based on the source of the connections into domestic and international social capital. Here international social capital is supposed to provide better access to beneficial assets, such as financial resources, market knowledge, perceived legitimacy and favourable contacts abroad, thus resulting in greater sales growth and internationalization performance on average for the early and rapidly expanding firms.

## **2.4 Hypotheses**

From the covered multidisciplinary research on the growth and internationalization of new ventures, hypotheses on the impact of public internationalization assistance,

external financing, venture capital and international social capital on the growth and internationalization of Born Globals are contrived. In the forthcoming analysis these hypotheses will be used to quantitatively assess whether statistically significant differences exist among the sets of companies characterized by each of the identified variables. The first set of hypotheses covers the assumed impact of public internationalization support, after which hypotheses on the impact of external financing and venture capital funding are derived. Lastly hypotheses for testing the influence of international social capital on Born Global performance are presented.

#### *Public internationalization support*

The project provided the accepted companies with expert services to support their internationalization, which were administered along three divergent paths: *the Market Preparation Path*, *the Market Access Path*, and *the Risk Investment Path*. Participant companies used these services for €48 000 on average with the purchased services totalling €2.8 million altogether at the projects conclusion. Over 100 external contacts and consultants were utilized in delivering the offered services, of which around half came from the foreign markets that were entered. Hence, based on the reviewed literature on external funding and social capital, the provided assistance in the form of paid for services, generated international and domestic contacts, and increased exposure to external investors should in theory assist in overcoming the challenges associated with early growth and internationalization. Moreover, the selection process of the project attempted to identify the companies with the greatest growth potential and readiness for internationalization. This selective entry process in theory should also have provided a similar screening benefit as witnessed in the selection of companies by venture capital organizations. Thus, the following hypotheses are posited on the utility of the project itself and the applicability of similar projects providing targeted public internationalization assistance.

**Hypothesis 1 (H1):** *Companies that participated in the project should on average exhibit higher absolute sales growths than the rejected applicants.*

**Hypothesis 2 (H2):** *Companies that participated in the project should on average exhibit greater internationalization ratios than the rejected applicants.*

**Hypothesis 3 (H3):** *Project participants should on average have attracted external equity-based funding, venture capital and international social capital more often than the rejected applicants.*

#### *External funding*

Building on the premise that Born Global companies encounter significant financial challenges during their early growth and internationalization, it is assumed that the more capital a company has at its disposal the better it is prepared to face the rigours and challenges associated with early and rapid internationalization (Gompers and Lerner, 2004). Furthermore, such capital constraints have been particularly identified to exist in technology oriented and knowledge-intensive start-ups, which due to their elevated research and development endowments are often unable to finance growth self-sufficiently (ibid). However, as traditional capital markets and debt financing alternatives, such as bank loans and issuance of public stock, are often inaccessible to start-ups due to information asymmetries, start-ups need to attract risk funding from equity investors (Gompers and Lerner, 1998). Thus, the external financing of Born Global firms usually exchanges an equity stake in the start-up for capital afforded by angel investors, corporate investors or independent venture capital firms (Botazzi and Da Rin, 2002). Based on the aforementioned rationale the following hypothesised on external funding is proposed.

**Hypothesis 4 (H4):** *Start-ups that accrued equity-based investments from external actors should on average exhibit higher absolute sales growth figures than the start-ups that did not accrue any external equity-based capital over the period of examination.*

#### *Venture Capital funding*

Of the identified practicable external financing options, independent venture capital funding is commonly recognized as the most suitable form of financing for technology intensive new ventures (Botazzi and Da Rin, 2002). Existing research on the impact of

venture capital on the development of start-ups suggests a positive relationship between VC funding and start-up performance (Bertoni, et al., 2011). This enhanced performance has largely been attributed to the venture capitalists ability to select winners by better addressing the prevailing information asymmetries, as well as, providing superior value-adding support than the other available sources of risk funding (Bertoni et al., 2011; Croce et al., 2013). In theory professional venture capitalists should have more social capital and financial resources at their disposal than their angel counterparts, while, also having less strategic overlap and better incentivizing structures in place than corporate investors (Sahlman, 1990). Thus, the following hypotheses on the benefits of venture capital are asserted.

**Hypothesis 5 (H5):** *The start-ups that accrued external funding from independent venture capital organizations should exhibit higher absolute sales growth on average than their non-VC backed counterparts over the 5-year period of study.*

**Hypothesis 6 (H6):** *Companies that received financing from independent venture capital organizations ought to display higher absolute growth than start-ups that accrued capital from other equity-based investors over the 5-year period of study.*

Furthermore, the early and rapid internationalization of Born Globals is considered to further intensify the need for capital and human resources, managerial experience and international knowledge, as well as, more extensive foreign network connections (Gabrielsson et al., 2004). Hence, Born Globals, as start-ups, are subject to the same resource dependencies as domestic new ventures in supporting their initial growth, while also facing the exacerbated demands of realizing a strategy of early and rapid internationalization (Freeman et al., 2006). The copious financial needs associated with Born Global growth were highlighted by Gabrielsson, Sasi and Darling (2004, p.593), whom acknowledged that “Rapid globalization is expected to put extremely high pressure on organizing financial resources for a faster, deeper, and more expansive global commitment.” In order to transcend these excessive capital demands associated with a global strategy, Born Globals near unequivocally need to rely on external sources of funding. As substantiated in the prior section, independent venture capital investors



are considered as the most advantageous source of funding for new venture growth. Consequently, the non-financial support from monitoring, mentoring and incentivizing should also provide advantages for new venture internationalization. Moreover, based on the social capital literature, the expansive business networks of venture capitalists should also positively contribute to the foreign expansion of Born Global firms. From these justifications the following hypotheses are derived.

**Hypothesis 7 (H7):** *Start-ups that accrued external funding from professional venture capital investors have higher internationalization ratios than their non-venture capital funded counterparts.*

**Hypothesis 8 (H8):** *Start-ups that accrued external funding from professional venture capital investors have higher internationalization ratios than start-ups that accrued capital from other equity-based investors over the 5-year period of study.*

#### *International Social Capital*

As clearly ascertained in the reviewed literature, for companies social capital is an important means for attaining resources and taking advantage of opportunities in both domestic and international business settings. Hence, to assist the successful early and rapid internationalization of start-ups, existing international connections are required. In practice this means that the top management team of a start-up needs to possess international social capital for it to be able to enact on opportunities and commence foreign operations at such an early stage. This international social capital usually comes from the existing networks of the entrepreneurs, alongside external managerial hires, or through the connections provided by equity investors. The more distinctive international connections a Born Global firm has at its behest, the more it can benefit from its network during its early and rapid internationalization. As it is difficult to qualitatively assess the internationality of each top managerial member, the national origin of the top-level executives is used as an indicator for heightened international social capital in the selected new ventures. Consequently, the companies with one or more participant of non-Finnish decent in their top governance, either as CEO, as Board members or as equity investors, are considered to be better prepared to overcome the obstacles early

and rapid internationalization and especially those associated with the supposed liability of foreignness. Furthermore, as the networks of connections of domestic managers are more likely to intersect, international participation in the top management of a firm should on average provide the firm with more new and idiosyncratic connections, again increasing the total social capital possessed by a company. Hence, the following hypotheses are postulated.

**Hypothesis 9 (H9):** *Start-ups with international presence in their top management should on average display greater absolute growth in comparison to companies with solely Finnish governance.*

**Hypothesis 10 (H10):** *The internationalization ratio of start-ups with international presence in their top management is higher on average than of companies with solely Finnish governance.*

#### *Relationship between internationalization and growth*

Research on the internationalization of Born Globals has suggested that despite being categorically disadvantaged by their characteristic resource poverty and foreignness, the decision to pursue rapid internationalization is considered to be a value-maximizing choice based on the particular resources and capabilities of the company (Mudambi and Zahra, 2007). With Born Globals often operating in defined niche markets, domestic markets often cannot provide sufficient demand to support start-up growth on their own. Therefore, in order to attain the required scale to survival and become profitable, early and rapid foreign expansion is required (Oviatt and McDougall, 1995). Moreover, the success of their early and rapid expansion is critical to the survival of Born Globals. Because of their technology intensive nature, Born Global firms typically only have a brief window of opportunity to introduce a product or service before the perceived market opportunity is exploited by a competitor (ibid). Additionally, after unveiling the product or service to the public, Born Globals must expand rapidly to fend off potential competitors and imitators as their technology can no longer be considered private knowledge (Gabrielsson and Kirpalani, 2012). Thus, the following is hypothesised for the correlation between the attained growth and internationalization of Born Globals.

**Hypothesis 11 (H11):** *Born Global firms that achieved higher internationalization ratios should also have attained greater absolute sales growths over the 5-year period of study.*

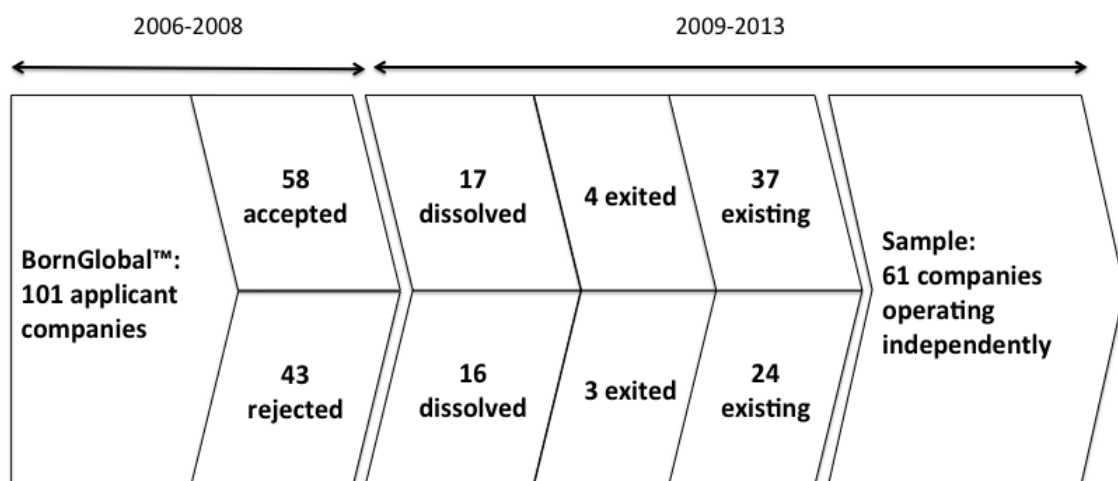
### 3 RESEARCH METHOD

This chapter outlines the methodological decisions and research techniques used in testing the generated hypotheses. To answer the set research question, various statistical methods were used to examine the relationships between the identified variables of Born Global growth and internationalization. The utilized statistical methods of this study were of non-parametric design, as the assumption of normality in the dependent variables could not be sufficiently substantiated. In the following sections the core methodological aspects related to the sample, the collection of data, the methodological decisions, and the chosen non-parametric tests are covered in more detail. Finally, the reliability, validity and generalization of the research methods are evaluated.

#### 3.1 Sample

The sample of this research consists of 61 Finnish technology-based start-ups that applied to the project in between August 2006 and August 2008. All of the 61 selected start-ups were independently operating at the end of the 2012 accounting year. Predominantly, all of the applicant firms befitted the age and high technology classifications used in prior Born Global research (Coviello and Jones, 2004; Ranft and Lord, 2000). Additionally, all sample companies at the time of application were unlisted and independent business entities based and incorporated in Finland. The detailed configuration of the sample is displayed in **Figure 2**.

**Figure 2: Configuration of the sample**



## **3.2 Data collection**

In collecting the data, various primary and secondary sources were utilized. Historic data on the companies revenues, internationalization percentages, and accrued investments that predated the project was collected from the archived application forms, business plans and other attached documents submitted by each of the firms upon application. Information on the subsequent performance, accrued financing, and the nationalities of the top management teams were accessed from the official trade register documents and financial statements of the companies through the VIRRE Information Service provided by the National Board of Patents and Registration of Finland and the Finnish Tax Administration. Data on the international sales figures for 2012 was gathered through direct correspondence with the sample companies' representatives with around 75% of the companies providing the requested information. Lastly, additional information regarding the external funding and investor type was gathered from online sources, including the Technopolis Online investment database, the new investment targets from 2000 to 2011 as published by the Finnish Venture Capital Association (FVCA), and various other online databases, news sites, company webpages and press releases.

## **3.3 Research variables**

To test the hypotheses the following test variables were developed and implemented. These variables, displayed in **Table 1**, were conceived based on prior research, their applicability and practicality in answering the set research questions, as well as, on the accessibility of the data.

### **3.3.1 Dependent variables**

#### *Absolute sales growth:*

Consistent with numerous prior studies on start-up growth (Delmar et al., 2003), the absolute change in sales over a five-year period was selected as the variable for evaluating company growth in this study. Although, various other indicators, such as assets, personnel, market share, and profits have also been used, sales growth is

generally accepted as a key indicator for organizational performance in prior entrepreneurial and new venture research (Bloodgood et al., 1996). Moreover, sales growth is also the metric most often advocated by entrepreneurs themselves (Delmar et al., 2003) The decision to use sales growth was also supported by the accessibility of the data, as complete revenue figures could be attained through the financial statements of all the applicant companies. The absolute sales growth was calculated in Euros from the turnovers of the sample firms in 2008, the year the project was concluded, and the revenue figures listed five years later for the 2012 accounting year. Furthermore, absolute sales growth was preferred over relative sales growth due to the high variance in the initial sales figures. As the starting revenues varied from zero to multiple millions, absolute sales growth was deemed to provide a more meaningful and insightful measure of actual growth for the sample start-ups.

**Table 1: Research variables**

<b>Variable:</b>	<b>Description:</b>	<b>Data type:</b>
Absolute Sales Growth	The absolute change in sales revenue over a five-year period from 2008 to 2012.	Ratio
Internationalization Ratio	The percentage of a company's international sales (sales from outside of Finland) from its total sales in 2012.	Interval
External Funding	Accrual of equity-based funding from an external, third party investor during the company's lifetime.	Nominal (Binary)
Venture Capital Funding	Presence of an independent venture capital fund in the external funding of sample companies.	Nominal (Binary)
Type of External Funding	Classification based on the type investing parties involved into three groupings, namely: No External Investment, Other PE Investment and Venture Capital.	Nominal (Categorical)
International Social Capital	International involvement (non-Finnish citizens) in the top governance of the sample companies.	Nominal (Binary)

### *Internationalization ratio*

The percentage of foreign sales to total sales was chosen as the variable for measuring the degree of internationalization attained by the sample companies. In spite of the considerable heterogeneity in prior internationalization research, the ratio of a firm's foreign sales to its total sales is considered as the most common metric for depicting the level of a firm's international involvement in new venture and Born Global literature (Gabrielsson et al., 2008; Keupp and Gassmann, 2009). As all the sample companies were based in Finland at the time of application to the project, the ratio of sales originating from outside Finland in 2012 was used as the proxy for internationalization regardless of whether companies moved significant operations or established headquarters abroad later on.

### **3.3.2 Explanatory variables**

#### *External funding*

A dummy variable signifying the disbursement of an equity offering to a third party investor was used to differentiate between companies that had attained external equity-based financing and firms that did not (Botazzi and Da Rin, 2002). This indicator included the funding accrued from independent venture capital firms, angel investors, corporate venture arms, and quasi-governmental investment vehicles. Private placements by the entrepreneurs or founding partners, as well as, funding and subsidies from public institutions such as Tekes, the Finnish Funding Agency for Innovation, or Ely-keskus, the Centre for Economic Development, Transport and the Environment, were excluded as categorically most if not all of the sample companies would have qualified.

#### *Venture Capital funding*

A further binary variable was instituted to determine whether an independent venture capital firm was present in the external funding of the sample companies. This variable distinguishes the companies that accrued funding from independent venture capital organizations from the firms that solely attained funding from investor types not

identified as venture capital firms, which included angel, corporate and quasi-governmental investor, as well as, all the firms that did not attain any external financing as determined in the *External Funding* section above. However, as the distinction between independent venture capital and other forms of private-equity funding is not always straightforward (Gompers and Lerner, 2000), the placement of each funding party into the ascribed investor types was determined using Technopolis Online and Crunchbase investor profiles, investors websites, organizational structures, investment strategies, and prior investment behavior on a case-by-case basis. Due to the lack of verifiable and comprehensive information regarding the timing and value of the recorded rounds, such measures were omitted from the analysis.

#### *Type of external funding*

A categorical nominal variable was used to group the sample firms into three categories based on the type funding they had raised, namely: No External Investment, Other PE Investment and Venture Capital. These categories separated the companies into three distinct groupings that were determined on the above-mentioned merits discussed in the *External Funding* and the *Venture Capital Funding* sections.

#### *International Social Capital*

International involvement in the top governance of a start-up was instituted to differentiate between varying degrees of international social capital possessed by the sample firms. A dummy variable was used to discern companies that had one or more foreign national, as in a citizen of non-Finnish decent, in their Board of Directors, acting as CEO, or the involvement of a non-Finnish entity as an equity investor the company.

### **3.4 Statistical methods of analysis**

To infer relationships from the sample to the population, statistical analysis is required. In this research three non-parametric tests, namely the Mann-Whitney test, the Kruskal-Wallis test and the Spearman correlation coefficient, were utilized because the assumption of normal distribution in the dependent variable was not appropriately supported. The Mann-Whitney test determines whether a significant difference exists



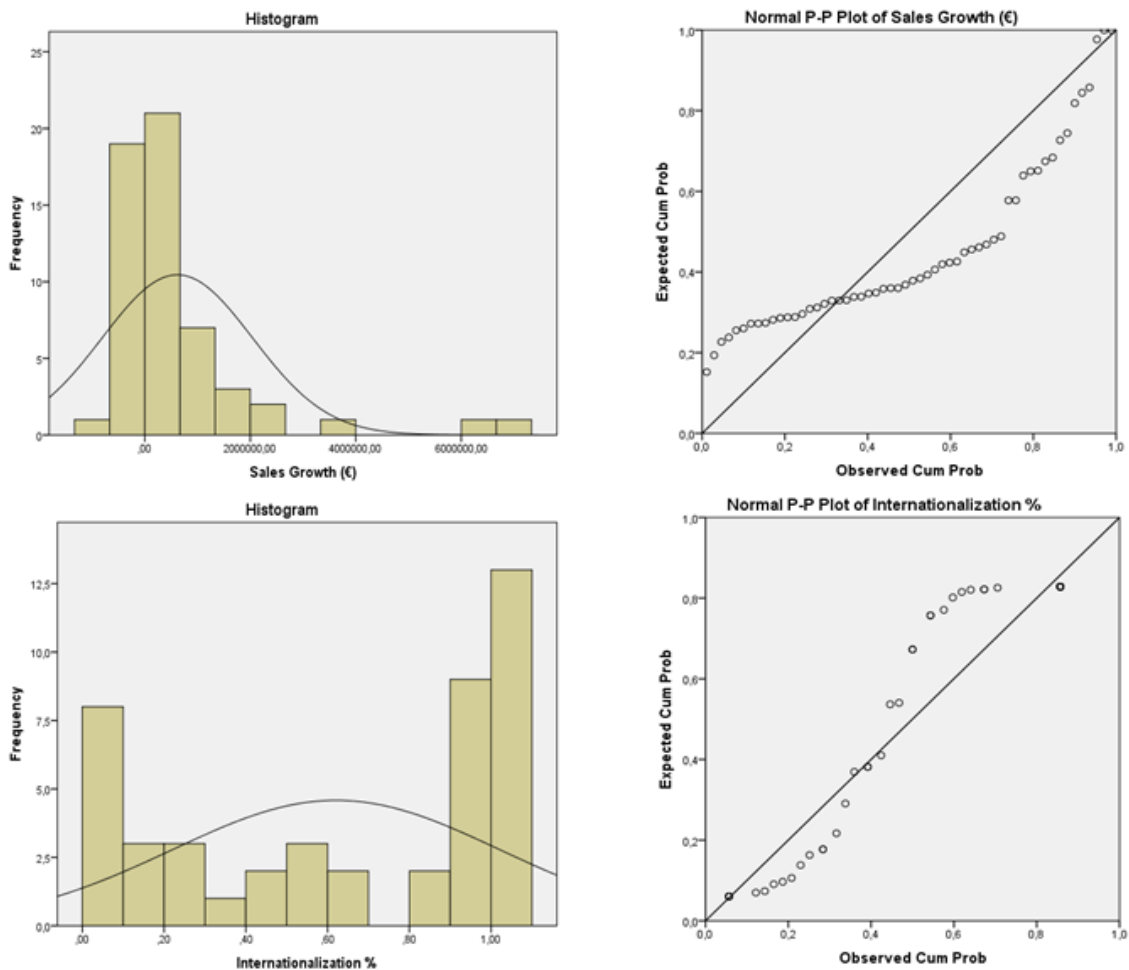
between the means of two independent groups in relation to a continuous variable, the Kruskal-Wallis test differentiates between the means of several independent groups and a continuous variable, while the Spearman correlation coefficient,  $r_s$ , examines the relationship of two continuous variables. These three tests are the non-parametric equivalents of the independent t-test, the one-way independent ANOVA, and the Pearson's correlation coefficient,  $r$ . All three of the selected tests operate on the principle of ranking the whole dataset from the lowest score to the highest (Field, 2009). Furthermore, cross-tabulation is used to determine the relationship between two categorical sets of data using the Pearson's Chi-squared test statistic  $X^2$ .

Although most statistical models are in the form of parametric test, they rely on certain assumptions to be fulfilled in order for them to be accurate. As parametric tests are based on the normal distribution of data, a basic assumption for conducting them is that the sample data is derived on random from normal distributions. With distributions that are significantly skewed, have hefty tails, or when influential outliers exist, the standard error of the sample mean becomes inflated, effectively distorting the assumptions behind the parametric tests and potentially impairing them (Field, 2009). From looking at the frequency distributions and the P-P Plots of the two dependent variables, the absolute sales growth over 5-years and the internationalization ratio, it is evident that neither one substantially fulfills the condition of normal distribution (**Figure 3**). For absolute sales growth this visual representation is also supported by the distribution of Z-scores, which shows three Z-scores (5, 4%) having values greater than 1.96, of which two are above the 3.29 threshold as significant outliers. Even though the Z-score distribution for internationalization indicates that there are no outliers in the data, as it is in the form of interval data, the visual representation in the histogram shows a U-shaped dispersion inconsistent with the normal distribution.

In instances of non-normal distributions data various options are feasible for correcting the data. Principally these means involve either removing or changing the outlier scores, or transforming the data to reduce the effects of outliers, skewness, or kurtosis. However, these options are not necessarily able to sufficiently correct the data and can subsequently lead to further erroneous estimations. Moreover, the positive outcomes of

transformations have been contested in statistics literature, as the evidence supporting the benefits of transformations have been found to be far from definite (Grayson, 2004).

**Figure 3: Frequency distributions and P-P Plots of dependent variables**



Another exercisable option is using non-parametric tests, which are less frequent than their parametric counterparts, but are considered more robust for irregularly distributed data. This perceived robustness is because of the fewer assumptions made by non-parametric tests regarding the distribution of the variables, one of them being that normally distributed data is no longer required (Wilcox, 2012). Although, some explanatory value is lost from ranking the data, because of the aforementioned issues with the normality of the dependent variables non-parametric equivalents to the more frequently used parametric tests were consequently selected for testing the hypotheses

of this research. The four non-parametric methods of statistical analysis used in this research are described as follows.

### **3.4.1 Cross tabulation: Pearson's Chi-square test of independence**

Cross tabulation, also referred to as contingency table analysis, is a statistical method for the examination of the relationship between the distributions of two categorical variables (Lewis-Beck, 2004). In Cross tabulation the frequency distributions of the categorical variables are slotted into a two dimensional table, so that the distribution of one variable is allotted against the results of the other variable, thus providing a basic display of the variables statistic association with one another. For statistical inference a Chi-square test statistic is calculated (Williams, 2007). A Chi-squared test is a non-parametric test for assessing statistical significance between two categorical variables, where the sampling distribution of the test statistic is in the form of a chi-squared distribution when the null ( $H_0$ ) hypothesis is upheld (Connor-Linton, 2010). The chi-square distribution is derived “from the sums of squared standard normal variables (Platt, 2004, p. 122)”. A variety of chi-square tests are available to infer relationships from categorical data, of which the Pearson's Chi-squared test statistic,  $X^2$ , is the most often employed.

The Pearson's Chi-squared test ( $X^2$ ) investigates for the independence between the two variables by determining whether the difference between the observed distributions and the expected results are statistically significant (Vogt, 2005). In the Chi-test, “The larger the observed frequency is in comparison with the expected frequency, the larger the chi-squared statistic. The larger the chi-squared statistic, the less likely the difference is due to chance, that is, the more statistically significant it is (Vogt, 2005, p.44).” The Pearson's Chi-squared test is also used to assess goodness-of-fit between the observed distribution and a theoretical distribution (Williams, 2007). The chi-square test statistic,  $X^2$ , is calculated with the following equation, where  $O$  is the observed value and  $E$  is the expected value (Lane, 2007, p. 137).

$$X^2 = \sum \frac{(O - E)^2}{E}$$

### 3.4.2 Mann-Whitney test

The Mann-Whitney test is the non-parametric equivalent of the independent t-test and is used to determine whether the means of two independent groups of data significantly differ from one another. The Mann-Whitney test entails calculating the test statistic  $U$  with the following equation where  $N_1$  and  $N_2$  are the samples sizes of the two groups and  $R_1$  is the sum of ranks for group one (Field, 2009, p. 544).

$$U = N_1N_2 + \frac{N_1(N_1 + 1)}{2} - R_1$$

If the sum of the ranks in the second group ( $R_2$ ) is greater than the sum of ranks in the first group,  $R_2$  and  $N_2$  replace  $R_1$  and  $N_1$  in the equation respectively. Alternatively, the test statistic for group two,  $U'$ , can be calculated from  $N_1N_2 - U$ , with the lower value between  $U'$  and  $U$  being the conclusive test statistic for determining the statistical significance (Hinton, 2010).

### 3.4.3 Kruskal-Wallis test

The Kruskal-Wallis test is the non-parametric equivalent of the one-way ANOVA. The test adds together the ranked values of each variable to determine whether the means of three or more independent variables are equivalent. The equation from Field (2009, p.560) is as follows, with  $N_i$  as the sample size of a particular group,  $N$  the total sample size, and  $R_i$  is the sum of the ranks for a each group.

$$H = \frac{12}{N(N + 1)} \sum \frac{R_i^2}{N_i} - 3(N + 1)$$

If the result of the test is significant ( $p < .05$ ), it is projected that at least one group is significantly different from the other groups in the sample based on the central-tendency theorem. “Like a one-way ANOVA, though, this test tells us only that a difference exists; it doesn’t tell us exactly where the differences lie (Field, 2009, p.564).” To identify between which groups the differences exist, post hoc procedures, such as

conducting Mann-Whitney tests for each of the possible pairs or analyzing the trends using the Jonckheere-Terpstra test, are needed (ibid).

#### **3.4.4 Spearman's correlation coefficient**

The Spearman's correlation coefficient is a non-parametric equivalent of the Pearson correlation coefficient. In calculation the Spearman's  $r_s$  the following equation (also used to calculate Pearson's  $r$ ) is employed on the ranked scores of two sets of interval data (Field, 2009, p. 170).

$$r_s = \frac{cov_{xy}}{s_x s_y} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{(N-1)s_x s_y}$$

In this equation  $cov_{xy}$  is the covariance of the x and y variables,  $s_x$  and  $s_y$  are the standard deviations of the variables,  $\bar{x}$  and  $\bar{y}$  represent the mean ranks of the two variables,  $x_i$  and  $y_i$  are data points of the ranked scores, and  $n$  is the number of observations (Field, 2009). The resulting correlation coefficient,  $r_s$ , indicates the direction and effect size of the correlation, with  $r_s$  only receiving values in between  $\pm 1$ . The  $\pm$  indicates the direction of the correlation and the correlation score indicates the size of the relationship between the variables. The larger the coefficient score the greater the effect, with  $\pm 1$  representative of a small effect size,  $\pm 3$  indicative of a medium effect size and  $\pm 5$  denominating a large effect size (Cohen, 1992).

#### **3.5 Validity, reliability and generalization of the findings**

The validity and reliability of the selected variables as proxies for growth, internationalization, types of external funding and social capital is discussed in their respective segments in section 3.3. Likewise, the validity and reliability of the chosen non-parametric statistical tests is partly covered in the sub-sections of section 3.4. The decision to use non-parametric tests instead of their more common parametric counterparts was determined based on the supposed non-normality in the distributions of the samples. When working with non-normal distributions non-parametric tests are favoured as the accuracy of parametric tests deteriorates when the standard error of the

sample means become inflated (Field, 2009). Because the selected non-parametric tests make fewer assumptions, these tests are in general considered to be highly robust. Despite producing low measurement errors, some explanatory value is acknowledged to be lost when ranking the data instead of using the absolute values (ibid). However, the extent of this loss in explanatory power has been debated in prior statistics research (Wilcox, 2012). The most prevalent limitation regarding the validity, reliability and generalization of the research in question comes from the relatively small sample size of 61 companies and the amplified effect that any missing data subsequently has on it.

Using quantitative methods often entails making inferences from a sample to the population (Muijs, 2011). As the relationships identified from a sample are never truly representative of the population, generalizing the findings requires calculating the probability of the recognized associations being true also in the population. In this research, the probability value of .05 (95% confidence) is used to assess whether or not the identified relationships are of statistical significance. When the probability of the hypothesised relationship is below .05 the alternative hypothesis ( $H_1$ ) is supported and the null hypothesis ( $H_0$ ) is consequently rejected. Inversely, when the probability exceeds .05 it is concluded that no verifiable relationship exists, and the null hypothesis is therefore accepted. Although there is very little justification for the used probability value of .05, it is considered the most common margin for determining significance in modern statistical research (Field, 2009).

## **4 EMPIRICAL ANALYSIS**

The subsequent segment details the basic criteria used in the analysis of the hypothesis, displays the descriptive statistics of the sample, and presents the results of conducted statistical analysis for each of the 11 hypotheses.

### **4.1 Basic criteria**

The presented non-parametric statistical methods; the Pearson's Chi-Square Test of Independence, the Mann-Whitney test, the Kruskal-Wallis test, and the Spearman Correlation Coefficient, were used to analyze the set hypotheses. In addition, post-hoc analyses in the form of Mann-Whitney and Jonckheere-Terpstra tests were employed to identify the location of the difference and the direction of the trend in the Kruskal-Wallis tests. A probability value of  $p < .05$  (95%) was implemented to determine whether the attained results are considered to statistically significant. This  $p < .05$  distinction fits in well with prior academic research, which predominantly has used one of  $p < .1$ ,  $p < .05$ , or  $p < .01$  to assign statistical significance (Field, 2009). However, as none of these used probability values has any scientific backing in delegating importance, the preferred level is based on the discretion of the researcher and the generic norms of statistical research.

Furthermore, as all the hypotheses generated in the present research are directional, the 1-tailed significance levels are reported and evaluated instead of the 2-tailed significance values. Graphs and tables are utilized to feature the attained results from the conducted statistical analysis in further detail. The Pearson's  $r$  statistic is used to assess the effect size of the relationships. Though, slightly ad hoc, the classifications by Fisher for evaluating the effect size are employed, with  $\pm .1$  indicating a small effect size,  $\pm .3$  a medium effect size, and  $\pm .5$  a large effect size (Field, 2009).

### **4.2 Descriptive statistics**

At the projects conclusion in 2008, 93 of the 101 start-ups that applied were still in operation and had a combined turnover of € 57, 9 million and average revenue of €623,000. Before applying for the project 27 of the 101 companies had foreign sales,

totalling €6,29 million and € 233,000 on average in international sales. Altogether 23% of all sales came from international markets in advance of the project. 65 of the applicant companies accrued external equity-based funding at one point or another, from which 37 included independent venture capitalist participation and 17 had an international independent venture capital firm involved. Of the entire applicant pool, 61 were in operation independently through the 2012 accounting year. Of the remaining non-independently operating firms, seven were acquired in full by other business entities, whilst 33 of the 101 initial companies have ceased operations.

The average age of the 61 independently operating Finnish technology-based ventures that formed the sample of the analysis was 7.3 years old at the end of 2012, with the youngest company being only 4 years of age and the oldest 14 years. In 2008, the year the project was concluded, the 61 sample companies had combined sales of €30, 2 million and average sales of € 495,000, with company sales ranging from only € 4,000 up to €5, 06 million. Five years later, the combined sales figure for 56 of the 61 companies that data was obtained for was €64 million in total and € 1,14 million on average, with firm sales in the range of nil to €7,9 million. Overall these companies (56) registered on average absolute sales growths of €616,000, corresponding to an average relative sales growth of 352% over the 5-year observation period. The highest recorded absolute growth was €7, 21 million (Case 22), whilst the poorest performance was a negative change in sales of € -848,000.

The average international sales ratio for the 46 ventures that disclosed information on their international sales figures was 62% in 2012, with international sales varying from no international sales to 100% of the sales coming from outside of Finland. These international sales percentages corresponded to average international sales of €837,000 and totalled €39, 3 million combined. Of the 61 sample start-ups, 39 had received external equity-based investments of which 23 included a independent venture capitalist as an investor, whilst 11 had raised capital from an international venture capital firms. In regards to the international social capital of the sample companies, 22 of the sample ventures had non-Finnish involvement in their top governance.



### 4.3 Statistical analysis

Hypothesis 1 (H1) proposed that the companies that participated in the project should on average display greater absolute sales growths in comparison to the firms that applied but did not gain admission. From the independently existing 61 sample start-ups, sales revenue data for 2012 was obtained for 56 companies, of which 36 were project participants and 20 were not. The start-ups that participated in the project averaged sales revenues of € 606,000 in 2008 and € 1,325,000 in 2012, with absolute sales growths of € 719,000 on average. The 20 rejected applicant companies averaged sales of € 385,600 in 2008 and € 817,000 in 2012, with an average absolute sales growth of €431,400. Average relative sales growths for the companies were closer, as participant firms grew 376% on average, while non-participants averaged a 309% increase in their sales. The worst performer in terms of revenue growth had its sales decrease € 848,000 over the five year span, whilst the best performer increased its sales by € 7,212,000 during the same time frame. In raw numbers the average sales of participant companies was higher than the revenues of rejected applicants both at the start and the end of the project.

**Table 2: Mann-Whitney test – Hypothesis 1**

		Ranks		
	BG Participant	N	Mean Rank	Sum of Ranks
Sales Growth (€)	No	20	26,80	536,00
	Yes	36	29,44	1060,00
	Total	56		

Test Statistics <sup>a</sup>	
	Sales Growth (€)
Mann-Whitney U	326,000
Wilcoxon W	536,000
Z	-,581
Asymp. Sig. (2-tailed)	,561
Exact Sig. (2-tailed)	,570
Exact Sig. (1-tailed)	,285
Point Probability	,006

a. Grouping Variable: BG Participant

However, based on the conducted Mann-Whitney test shown in **Table 2**,  $U=326.00$ ,  $z= -0.581$ , ns,  $r =-.078$ , no statistically significant difference was perceived between the absolute sales growths of the participant companies and the rejected applicants. As the alternative hypothesis  $H_1$  did not receive statistical support, the null hypothesis  $H_0$  could not be rejected.

Likewise, Hypothesis 2 ( $H_2$ ) designated that project participants ought to average higher internationalization ratios than their rejected counterparts. The 2012 international sales revenues were acquired from 46 of the 61 sample companies, of which 29 were participants and 17 were not. The firms that participated in the project had an average internationalization ratio of 68%, while the average ratio of foreign sales from total sales for the rejected applicants was 52%. The results of the Mann-Whitney test (**Table 3**),  $U=203,50$ ,  $z = -0,991$ , ns,  $r =-.146$ , indicate that despite a seemingly notable 16% difference, no statistical significance in the internationalization ratios was perceived between the two groups. Consequently, the experimental hypothesis  $H_2$  did not receive support and the null hypothesis  $H_0$  could not be discarded.

**Table 3: Mann-Whitney test – Hypothesis 2**

Ranks				
	BG Participant	N	Mean Rank	Sum of Ranks
Internationalization %	No	17	20,97	356,50
	Yes	29	24,98	724,50
	Total	46		

Test Statistics <sup>a</sup>	
	Internationalizati on %
Mann-Whitney U	203,500
Wilcoxon W	356,500
Z	-,991
Asymp. Sig. (2-tailed)	,322
Exact Sig. (2-tailed)	,328
Exact Sig. (1-tailed)	,164
Point Probability	,003

a. Grouping Variable: BG Participant

Hypothesis 3 (H3) deemed that participant companies should on average have attracted external equity-based funding, venture capital and international social capital more frequently than the non-participant ventures. Data on the external private equity, venture capital funding and international top management team participation was retained for each of the sample's 61 remaining start-ups. Of the 61 start-ups 40 (65,5%) had attained external equity-based funding, with 27 of the 37 (73%) participants and 13 of 24 (54%) rejected applicants getting external funding. In spite of the rather clear distribution in favour of the project participants, the performed Pearson's Chi-Square Test of Independence, **Table 4**, indicated that no significant relationship was found between project participation and attracting external private equity investments,  $X^2(1) = 2.28$ ,  $N = 61$ ,  $p > .05$ ,  $r = .19$ .

**Table 4: Pearson's Chi-Square test of independence – Hypothesis 3 - 1**

**Crosstab**

Count

		BG Participant		Total
		No	Yes	
External PE Investment	No	11	10	21
	Yes	13	27	40
Total		24	37	61

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2,281 <sup>a</sup>	1	,131		
Continuity Correction <sup>b</sup>	1,524	1	,217		
Likelihood Ratio	2,261	1	,133		
Fisher's Exact Test				,171	,109
Linear-by-Linear Association	2,243	1	,134		
N of Valid Cases	61				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 8,26.

b. Computed only for a 2x2 table

Moreover, out of the 61 sample firms 23 (38%) were able to attract professional venture capital funding, with participant companies securing VC funding in 17 of the 37 (46%) cases and rejected applicants registering 6 VC funded ventures out of 24 (25%). The conducted Pearson Chi-Square Test of Independence provided a  $p < .1$  result, indicating a quite significant relationship between the two variables, but not adequate enough to exceed the set  $p < .05$  limit. Thus, the relationship between project participation and independent VC funding was deemed to not be statistically significant, with  $X^2(1) = 2.72$ ,  $N=61$ ,  $p>.05$ ,  $r =.21$  (**Table 5**).

**Table 5: Pearson’s Chi-Square test of independence – Hypothesis 3 - 2**

**Crosstab**

Count

		BG Participant		Total
		No	Yes	
VC (Non-Governmental)	No	18	20	38
	Yes	6	17	23
Total		24	37	61

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2,719 <sup>a</sup>	1	,099		
Continuity Correction <sup>b</sup>	1,900	1	,168		
Likelihood Ratio	2,796	1	,095		
Fisher's Exact Test				,114	,083
Linear-by-Linear Association	2,675	1	,102		
N of Valid Cases	61				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 9,05.

b. Computed only for a 2x2 table

In relation to international top management participation, 16 (43%) participants and 6 (25%) non-participants had foreign top managerial input. However, once more the Pearson Chi-Square Test of Independence (**Table 6**) could not validate a statistically significant relationship between project participation and attracting international top managerial participation,  $X^2(1) = 2.10$ ,  $N=61$ ,  $p>.05$ ,  $r =.19$  As none of the examined

relationships were statistically significant, the alternative hypothesis  $H_3$  did not receive any support and consequently  $H_0$  could not be rejected.

**Table 6: Pearson's Chi-Square test of independence – Hypothesis 3 - 3**

**Crosstab**

Count

		BG Participant		Total
		No	Yes	
International Top Management Team	No	18	21	39
	Yes	6	16	22
Total		24	37	61

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2,101 <sup>a</sup>	1	,147		
Continuity Correction <sup>b</sup>	1,384	1	,239		
Likelihood Ratio	2,156	1	,142		
Fisher's Exact Test				,180	,119
Linear-by-Linear Association	2,067	1	,151		
N of Valid Cases	61				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 8,66.

b. Computed only for a 2x2 table

Hypothesis 4 posited that companies that acquired some form of external PE financing would have superior sales growths (€) than their non-equity financed counterparts. Of the 56 companies that sales growth data was accrued on, 38 had attained external PE funding and averaged growths of €738,000 over the five year period. For the 18 companies that did not gain equity funding, the average sales growth was €358,000. Nevertheless, based on the Mann-Whitney test the absolute sales growth of companies that had accrued PE financing did not significantly differ from firms that had not received PE funding,  $U=272.00$ ,  $z = -1.23$ , ns,  $r = -.16$  (**Table 7**). Thus, in the case of  $H_4$  the alternative hypothesis  $H_4$  is not supported and the null hypothesis  $H_0$  could not be rejected.

**Table 7: Mann-Whitney test – Hypothesis 4**

Ranks				
	External PE Investment	N	Mean Rank	Sum of Ranks
Sales Growth (€)	No	18	24,61	443,00
	Yes	38	30,34	1153,00
	Total	56		

Test Statistics <sup>a</sup>	
	Sales Growth (€)
Mann-Whitney U	272,000
Wilcoxon W	443,000
Z	-1,228
Asymp. Sig. (2-tailed)	,219
Exact Sig. (2-tailed)	,225
Exact Sig. (1-tailed)	,113
Point Probability	,003

a. Grouping Variable: External PE Investment

Hypotheses 5 and 6 investigated the effect of independent venture capital financing on absolute sales growth (€). Hypothesis 5 examined the difference in absolute sales growth over the five-year assessment period between the 22 companies that had received funding from professional venture capital investors and the 34 firms that had not. In descriptive figures the averaged absolute sales growth for non-VC financed companies was €307,000, less than a third of the €1,09 million sales growth averaged by VC funded firms. The conducted Mann-Whitney test revealed that the absolute sales growth of VC funded companies was significantly greater than the revenue growth of the non-VC funded firms,  $U=262.00$ ,  $z=-1.88$ ,  $p < .05$ ,  $r = -.25$  (**Table 8**). Hence, for H5 the alternative hypothesis  $H_5$  is supported and the null hypothesis  $H_0$  is conversely rejected.

**Table 8: Mann-Whitney test – Hypothesis 5**

		Ranks		
	VC (Non-Governmental)	N	Mean Rank	Sum of Ranks
Sales Growth (€)	No	34	25,21	857,00
	Yes	22	33,59	739,00
	Total	56		

**Test Statistics<sup>a</sup>**

	Sales Growth (€)
Mann-Whitney U	262,000
Wilcoxon W	857,000
Z	-1,879
Asymp. Sig. (2-tailed)	,060
Exact Sig. (2-tailed)	,061
Exact Sig. (1-tailed)	,031
Point Probability	,001

a. Grouping Variable: VC (Non-Governmental)

Hypothesis 6 introduced a third group as a categorical variable, with the investor type being further distinguished between companies that had acquired VC funding (22), non-VC equity funding (16), and no equity-based external funding (18). The Kruskal-Wallis test was utilized to test between these three categorical variables. The results of the test and a combined boxplot of the variables are found in **Table 9** and **Figure 3** respectively. Despite the significant positive relationship attained in H5 between VC funding and sales growth, the outcome of the Kruskal-Wallis test for H6,  $H(2) = 3,58$ , ns, produced a non significant result. However, the post-hoc Jonckheere-Terpstra test did show a significant ( $p < .05$ ) positive trend,  $J=634$ ,  $z = 1,75$ ,  $r=.23$ . Although, the results for H6 are rather contradictory, the  $H_0$  for H6 is upheld and the alternative hypothesis  $H_6$  is subsequently rejected as the results of the elected Kruskal-Wallis test did not produce definitive evidence to support the claim. However, based on H5 and the Jonckheere-Terpstra test, the proposition that VC financing is positively related to growth is still maintained, but the alleged greater impact of VC financing on growth as opposed to the influence of other external equity funding options is uncertain and thus invalid.

**Table 9: Kruskal-Wallis test – Hypothesis 6**

Ranks			
	Investor Type	N	Mean Rank
Sales Growth (€)	None	18	24,61
	Other (PE/Gov)	16	25,88
	VC	22	33,59
	Total	56	

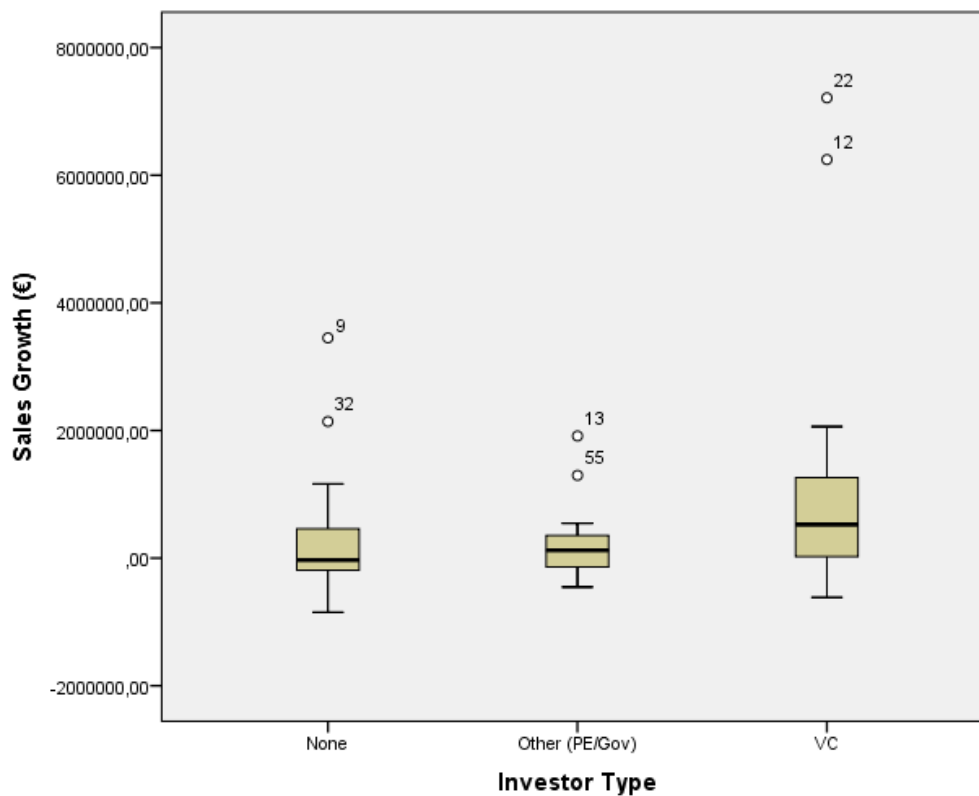
Test Statistics <sup>a,b</sup>	
	Sales Growth (€)
Chi-Square	3,581
df	2
Asymp. Sig.	,167

a. Kruskal Wallis Test

b. Grouping Variable: Investor

Type

**Figure 4: Investor type boxplot – Hypothesis 6**





Hypotheses 7 and 8 addressed the relationship between VC financing and internationalization. The Mann-Whitney test was used to examine the relationship between VC funding and superior internationalization. For H7, the results (**Table 10**) of the analysis show that the achieved internationalization ratios of the VC funded companies (Mn=84%) were significantly different from the internationalization ratios of the non-VC funded ventures (Mn=47%) in 2012,  $U=116.50$ ,  $z = -3.16$ ,  $p < .001$ ,  $r = -.47$ . Subsequently, the null hypothesis  $H_0$  is soundly rejected as the alternative hypothesis  $H_7$  received statistical support.

**Table 10: Mann-Whitney test – Hypothesis 7**

		Ranks		
	VC (Non-Governmental)	N	Mean Rank	Sum of Ranks
Internationalization %	No	27	18,31	494,50
	Yes	19	30,87	586,50
	Total	46		

**Test Statistics<sup>a</sup>**

	Internationalization %
Mann-Whitney U	116,500
Wilcoxon W	494,500
Z	-3,161
Asymp. Sig. (2-tailed)	,002
Exact Sig. (2-tailed)	,001
Exact Sig. (1-tailed)	,001
Point Probability	,000

a. Grouping Variable: VC (Non-Governmental)

For H8, the Kruskal-Wallis test was used to determine whether significant differences existed amongst the three identified investor categories. The conducted test identified that there was a significant difference between the internationalization ratios of the different investor types,  $H(2) = 10,72$ ,  $p < .01$  (**Table 11**). To follow up the findings, Mann-Whitney tests were conducted and an associative Bonferroni correction with a .0167 critical value for the level of significance was instituted. Based on these

additional analyses, the internationalization ratio was found not to vary significantly between PE-funded firms and firms with no funding ( $U= 94.00$ , ns,  $r=-.25$ ), however, for both pairs, VC funding and no equity funding ( $U=59.00$ ,  $p < .001$ ,  $r=-.6$ ) and VC funding and external equity-based funding ( $U=76.50$ ,  $p < .01$ ,  $r=-.39$ ), statistically significant relationships in favor of the impact of independent venture capital on internationalization were attained. Moreover, the Jonckheere-Terpstra test revealed an analogous positive trend in the data that showed a positive relationship between the perceived potency of the different investor classes and a higher median internationalization ratio,  $J=503$ ,  $Z=3,22$ ,  $p< .05$ ,  $r=. 47$ , which provided further support for the hypothesized impact of VC funding on internationalization. As the post-hoc Mann-Whitney and Jonckheere-Terpstra tests supported the significant relationship perceived between investor type and internationalization in the Kruskal-Wallis test, the alternative hypothesis  $H_8$  was supported and  $H_0$  was conversely rejected.

**Table 11: Kruskal-Wallis test – Hypothesis 8**

Ranks			
	Investor Type	N	Mean Rank
Internationalization %	None	15	16,37
	Other (PE/Gov)	12	20,75
	VC	19	30,87
	Total	46	

Test Statistics <sup>a,b</sup>	
	Internationalization %
Chi-Square	10,723
df	2
Asymp. Sig.	,005

a. Kruskal Wallis Test  
b. Grouping Variable: Investor Type

Hypotheses 9 and 10 examined the connection between greater amounts of international social capital in the top management of start-ups and improved sales growth and internationalization ratios. The international social capital variable differentiated companies that had foreign nationals in the governance of the firm or international

equity-based investors as shareholders from the ventures that comprised of solely domestic management and Finnish capitalization tables. On average companies with international top governance participation had internationalization ratios of 77% and an average absolute sales growth of € 1,136,000, whereas firms with fully domestic governance displayed an average internationalization ratio of 51% and mean sales growths of € 304,600.

Hypotheses 9 received backing from the Mann-Whitney test (**Table 12**),  $U=161,50$ ,  $z=-2,15$ ,  $p<.05$ ,  $r=-.27$ , as the internationalization ratios of firms with international top management were significantly greater than those of the purely domestically governed firms. Hence, the alternative hypothesis  $H_0$  received support and the null hypothesis  $H_0$  was duly rejected.

**Table 12: Mann-Whitney tests – Hypotheses 9 & 10**

	International Top Management Team	N	Mean Rank	Sum of Ranks
Sales Growth (€)	No	35	25,11	879,00
	Yes	21	34,14	717,00
	Total	56		
Internationalization %	No	27	19,98	539,50
	Yes	19	28,50	541,50
	Total	46		

**Test Statistics<sup>a</sup>**

	Sales Growth (€)	Internationalization %
Mann-Whitney U	249,000	161,500
Wilcoxon W	879,000	539,500
Z	-2,006	-2,145
Asymp. Sig. (2-tailed)	,045	,032
Exact Sig. (2-tailed)	,045	,031
Exact Sig. (1-tailed)	,023	,016
Point Probability	,001	,000

a. Grouping Variable: International Top Management Team

Likewise, the conducted Mann-Whitney test for H10 (**Table 12**) showed that having an international participant in the governance of a start-up resulted in greater on average sales growth returns in comparison to start-ups with an entirely domestic management team,  $U=249$ ,  $z=-2,01$ ,  $r= -.27$ ,  $p<. 05$ . This result gave support for the alternative hypothesis  $H_7$  leading to the rejection of the null hypothesis.

The final hypothesis, H11, was derived on the assumptions of the prior hypotheses and subsequently examined the relationship between the two dependent variables of internationalization and sales growth. For this specific type of internationally oriented start-ups, the underlying assumption was that successful internationalization would positively contribute to greater sales performance, as the Finnish domestic market on its own would not be sufficient for supporting the desired growth and for accomplishing the selected growth strategies. To determine the significance of the relationship between the two continuous variables, Spearman's Correlation Coefficient  $r_s$ , was calculated. The correlations of the test are displayed in **Table 13**. Based on the analysis, no significant relationship between internationalization and sales growth could be verified,  $r_s = .08$ , ns. As such, the  $H_0$  for H11 could not be rejected and  $H_{11}$  was successively discarded.

Table 13: Spearman's correlation coefficient – Hypothesis 11

Correlations		Internationalization %	Sales Growth (€)
Spearman's rho	Correlation Coefficient	1,000	,080
	Internationalization % Sig. (1-tailed)	.	,300
	N	46	45
	Correlation Coefficient	,080	1,000
Sales Growth (€)	Sig. (1-tailed)	,300	.
	N	45	56

## 5 DISCUSSION

In the following section the results and implications of each of the analyzed hypotheses are discussed. **Table 14** contains a summary of the postulations and the results for the 11 hypotheses.

**Table 14: Summary of hypotheses**

<b>Hypothesis:</b>	<b>Postulation:</b>	<b>H<sub>n</sub></b>	<b>H<sub>0</sub></b>
<b>H1</b>	Companies that participated in the project should on average exhibit higher absolute sales growths than the rejected applicants.	X	✓
<b>H2</b>	Companies that participated in the project should on average exhibit greater internationalization ratios than the rejected applicants.	X	✓
<b>H3</b>	Project participants should on average have attracted external equity-based funding, venture capital and international social capital more often than the rejected applicants.	X	✓
<b>H4</b>	Start-ups that accrued equity-based investments from external actors should on average exhibit higher absolute sales growth figures than the start-ups that did not accrue any external equity-based capital over the period of examination.	X	✓
<b>H5</b>	The start-ups that accrued external funding from independent venture capital organizations should exhibit higher absolute sales growth on average than their non-VC backed counterparts over the 5-year period of study.	✓	X
<b>H6</b>	Companies that received financing from independent venture capital organizations ought to display higher absolute growth than start-ups that accrued capital from other equity-based investors over the 5-year period of study.	X	✓
<b>H7</b>	Start-ups that accrued external funding from professional venture capital investors have higher internationalization ratios than their non-venture capital funded counterparts.	✓	X
<b>H8</b>	Start-ups that accrued external funding from professional venture capital investors have higher internationalization ratios than start-ups that accrued capital from other equity-based investors over the 5-year period of study.	✓	X
<b>H9</b>	Start-ups with international presence in their top management should on average display greater absolute growth in comparison to companies with solely Finnish governance.	✓	X
<b>H10</b>	The internationalization ratio of start-ups with international presence in their top management is higher on average than of companies with solely Finnish governance.	✓	X
<b>H11</b>	Born Global firms that achieved higher internationalization ratios should also have attained greater absolute sales growths over the 5-year period of study.	X	✓

In this section, the above-summarized findings are compared with the covered results of the prior academic literature. Inferences from the sample to the population are made and presented in accordance with the attained significance levels and effect sizes for each hypothesis. Finally, the limitations potentially impacting the results of the analyses are discussed.

### **5.1 Public internationalization support (H1, H2 & H3)**

The first set of hypotheses were intended to examine the success of the project and its configuration in supporting the growth and internationalization of Finnish Born Global ventures during their formative stages of development. Moreover, the impact of the project on the acquisition of external equity funding, professional venture capital and international social capital in the form of non-Finnish top managerial participation is evaluated. The hypotheses were derived from the existing literature on the innate challenges faced by Born Globals as start-ups, their specific challenges as Finnish high-technology firms, and the related literature on the benefits of external funding and social capital in supporting start-up growth and internationalization during the formative stages of Born Global expansion.

The descriptive statistics related to firm growth and internationalization showed that the performance of the participant companies exceeded the performance of the rejected applicants in both sales growth and internationalization. Of the 61 remaining applicant companies, the participant ventures averaged an absolute sales growth of €719,000 over the five-year period and a mean internationalization ratio of 68%, while their non-participant counterparts registered an average of €431,400 in absolute sales growth and a 52% internationalization ratio on average. The participant firms were also more successful in accruing capital from equity and ventures investors. Of the participant start-ups 73% were able to attain external equity funding and 43% managed to attract venture capital, whereas 54% of the non-participant firms received external equity funding and only 25% obtained professional venture capital. Similarly, international top managerial contribution was higher amongst the project participants than between the

rejected applicants, as 43% of the participant companies and 25% of the rejected applicants had international input in their top management team.

Despite receiving clear backing from the descriptive statistics, no statistical significance to support any of the postulations concerning the projects organization and benefits could be perceived of three hypotheses (H1, H2 and H3). The performed Mann-Whitney test for H1 produced a test statistic of  $U=326.00$ , a z-score of  $-0.581$ , a 1-tailed significance value of  $p = .285$  and an effect size of  $r=-.078$ . Not only was the attained significance value clearly over the set  $p<.05$  threshold of statistical significance the attained effect size was also small ( $<\pm.10$ ). For H2 the corresponding values were  $U=203,50$ ,  $z = -0,991$ , 1-tailed sig.  $p = .164$ , and  $r = -.146$ , which evidently indicated a non-significant relationship between project participation and internationalization. The Pearson Chi-Square  $X^2$  test statistics, 1-tailed significances, and effect sizes for H3 from the conducted cross tabulations resulted in  $X^2 (1) = 2.28$ ,  $N = 61$ , 1-tailed significance value  $p = .11$  and effect size  $r = .193$  for accruing external equity-based financing,  $X^2 (1) = 2.72$ ,  $N=61$ ,  $p = .08$ , and  $r = .211$  for attracting professional VC funding and  $X^2 (1) = 2.10$ ,  $N=61$ ,  $p = .12$ , and  $r = .186$  for acquiring international top management involvement. The above results indicated that no statistical significance could be inferred from the sample data to support the postulations of H3. However, based on the descriptive statistics alone, this particular project did in fact succeed in enhancing the prospects of its participant companies in comparison to the rejected applicants in all of the analyzed variables. Hence, despite receiving no significant statistical support to corroborate the hypothesized notions, the results only indicate that the ability of such projects in fostering growth, internationalization, and resource acquisition is indefinite. In other words similar positive results cannot be expected with certainty, but with good confidence it can be assumed that future projects would not deviate towards negative outcomes either.

## **5.2 External funding (H4)**

The fourth hypothesis put forth that start-ups that attracted external equity-based funding should fare better on average than the new ventures that relied solely on their

own resources and debt funding options. This hypothesis was devised based on the covered literature on start-up resource scarcity, especially of the extraordinary financial burden imparted by the early internationalization of Born Global ventures. This hypothesis was meant to differentiate between the effects of the financial contributions and the non-financial inputs provided by different investor types. The raw data indicated that the sample companies that had attained external funding, irrespective of the investor type, did have greater absolute growth figures on average. The 40 companies that had attracted equity-based investments averaged a sales growth of € 738,000, while the 21 firms without any equity-based funding on average grew by € 358,000 over the same five-year examination period.

However, based on the results of the conducted Mann-Whitney test,  $U=272.00$ ,  $z = -1.23$ , 1-tailed sig.  $p = .11$ ,  $r = -.16$ , no statistical significance was found to support the assertion of H4. Despite showing a probability value of almost 90%, the result was not sufficiently significant to support the hypothesis. Moreover, the attained result provided further backing supporting the importance of the investor type over the capital itself in the already debated topic between the relative significance of the hard and soft support imparted by external investors. In addition, the descriptive numbers yet again were clearly in favor of the hypothesized outcome. Thus, when limited to this specific sample, the notion that external capital has a positive effect on sales growth was upheld, but not in a large enough scale to be able to infer hypothesized effect to the population of similar Finnish technology start-ups.

### **5.3 Venture Capital funding (H5, H6, H7 & H8)**

Hypotheses five through eight concerned the impact of independent venture capital funding on Born Global growth and internationalization. These four hypotheses were derived from the abundant literature on the venture capital model and its ability in supporting and expediting start-up growth. While H4 focused on the financial contribution of all equity investors combined, the ensuing hypotheses on venture capital centered on the notion of so-called smart money or the superior soft support provided by this investor type. Hence, companies that had accrued VC funding were considered



to receive better support and more effective performance incentives than the firms that had other investors or no external backers involved. Moreover, professional venture capital investors were also considered to be more qualified in spotting scalable investment opportunities on average than the other types of available investors. Additionally, the presumed financial clout, vast experience and international networks of professional venture capital investors were deemed to expedite and assist in the early internationalization of start-ups. Furthermore, the prior venture capital literature also provided ample, yet rather inconclusive, findings on the advantages wrought by venture capital financing, which indicated that venture capitalist funded companies did in fact perform better across a multitude of performance indicators than non-VC funded ventures.

The descriptive statistics for H5, H6, H7 and H8 were strongly in accord with the hypothesized beneficial impact of venture capital on the growth and internationalization of Born Globals. H5 examined the relative impact of venture capital financing on firms in comparison to non-VC backed entities. The average absolute sales growth of €1,09 million for VC funded firms more than tripled the sales growth averaged by their non-VC financed counterparts. This clear difference was also substantiated by the results of the conducted Mann-Whitney test,  $U=262.00$ ,  $z=-1.88$ ,  $p = .031$ ,  $r = -.25$ . The significant result and the slightly below medium effect size indicate that a rather meaningful positive impact regarding the ability of VC funding in facilitating start-up growth could be inferred to the population of Finnish new technology-based ventures with over 95% certainty.

H6 investigated the effect of the three identified investment categories of venture capital, private equity and no external funding. However, the results of the Kruskal-Wallis test,  $H(2) = 3,58$  and the 1-tailed sig.  $p = .167$ , did not provide additional support in favor of VC funding, as no significant differences could be perceived between VC funding and the two other categories. Although, the alternative hypothesis for H6 was not supported, the post-hoc Jonckheere-Terpstra test did display a positive trend in support of the hypothesized claim,  $J=634$ ,  $z = 1,75$ , 1-tailed sig.  $p = .041$ ,  $r = .23$ . Despite the lack of support from the Kruskal-Wallis test, the results of H4 and H5

together with the positive trend of the post-hoc Jonckheere-Terpstra test indicate rather clearly that VC financing is more advantageous in prompting start-up growth than the available angel and corporate funding options or the alternative of not raising any external capital at all.

H7 and H8 provided a similar look into the effect of venture capital on the internationalization ratio of the sample start-ups. As indicated in the analysis section, both H7 and H8 received statistically significant support that validated the apparent and relationship between venture capital funding and higher internationalization ratios. The test statistics for H7,  $U=116.50$ ,  $z = -3.16$ , 1-tailed sig.  $p = .001$ ,  $r = -.47$ , indicated a very definite association between independent venture capital and internationalization performance, having a probability value exceeding 99% confidence. Moreover, the effect size  $r = -.47$  indicated a rather large effect size, signifying that attained VC funding not only has a greater impact on internationalization than its non-VC funded counterparts, but that the overall effect size of VC funding on the internationalization of the Finnish start-ups is noteworthy as well.

The Kruskal-Wallis test for H8 further substantiated the claim of venture capital funding leading to larger internationalization percentages,  $H(2) = 10.72$  and 1-tailed sig.  $p = .005$ . Additionally, the post-hoc Mann-Whitney tests identified that the significant differences persisted between the VC funding and external equity-based funding and the VC funding and no funding categories, whilst external equity investments and no external capital did not significantly differ statistically. Hence, the claim that venture capital enhances the internationalization of Finnish start-up ventures can be inferred to the entire population with a less than 1% probability of the identified divergence being erroneous in comparable firms.

Altogether the results of the four hypotheses on the advantage of accruing independent venture capital funding were rather conclusive in spite of the rejected alternative hypothesis in H<sub>6</sub>. These results align well with the findings of the covered literature on the benefits of VC funding and provide new insights by combining the selected performance indicators with a very recent sample of Finnish high-technology start-up

firms. Thus, it can be inferred to the population of similar Finnish and SMOPEC new ventures with certainty, that on average raising venture capital funding has a greater positive impact on both start-up growth and internationalization than the other presented investment alternatives or self-financed operation.

#### **5.4 International Social Capital (H9 & H10)**

Hypotheses 9 and 10 investigated the effect of increased international social capital on the growth and internationalization of Finnish technology start-ups. The notion of enhanced international social capital in the form of formal or informal foreign involvement in the top governance of the firm was derived from a combination of literature streams, including social capital theory, the networking theory of internationalization, and Born Global research on the advantages of prior international experiences and relationships of the entrepreneurs. Jointly this body of work suggested that social capital, external networks, and international working and living backgrounds all contributed positively to new venture internationalization through improved knowledge and sensitivity towards foreign cultures. Especially, the encompassing concept of international social capital was effusively identified to advance the international expansion of start-ups.

The descriptive statistics for international social capital indicated that the ventures with a multicultural top management team clearly outpaced the start-ups with solely Finnish governance. Companies with increased international social capital averaged internationalization ratios of 77% and grew their sales on average by € 1,136,000 over the five-year period. The firms governed by domestic top management teams attained corresponding figures of 51% for the mean internationalization ratio and € 304,600 for average sales growth. In line with the hypotheses and the descriptive figures, the conducted analyses for H9 and H10 produced positive results, with the Mann-Whitney tests resulting in  $U=161,50$ ,  $z=-2,15$ , 1-tailed sig.  $p=.023$  and  $r=-.32$  for H9 and  $U=249$ ,  $z=-2,01$ , 1-tailed sig.  $p=.016$  and  $r=-.27$  for H10. Based on the significance values, the alternative hypotheses of both H9 and H10 were statistically supported, indicating positive relationships between increased international social capital and sales

growth, as well as, improved international social capital and internationalization in Finnish technology start-ups with over 95% confidence. Using Fisher's effect size classifications, the  $r = -.32$  and  $r = -.27$  values for sales growth and internationalization respectively denoted that having international top management participation has a medium sized effect on both of the chosen performance indicators. From these results it can be inferred with good confidence that having international involvement in the top governance of a Finnish technology start-up produces greater sales growth and internationalization ratios than solely domestic management teams and has a rather meaningful effect on it.

### **5.5 Relationship between internationalization and growth (H11)**

H11 was formulated from various underlying assumptions and assertions from the covered literature that were used in forming the first ten hypotheses. Hypothesis 11 argued that Finnish Born Global firms, as ambitious start-ups from small and domestic economies, would need to internationalize extensively in order to achieve the required scale to survive and eventually succeed. This relationship between internationalization and growth was derived on various rationales. First, as Finnish firms, the companies were considered to operate in a too small of a domestic market to sustain and grow the business sufficiently. Secondly, as Born Globals often operate in niche market segments, the sample companies would need to gain sufficient traction and market share abroad to stave off competitors and imitators. Moreover, as aspiring Born Global firms, the aggressive pursuit of extensive international expansion is considered to be at the very core of their existence. Because of these pressures, inclinations and strategies, successful internationalization was considered to be critical to the overall success of the sample companies, as well as, the population of similar Finnish Born Global firms.

In spite of the above-mentioned justification, the postulation of H11 gained no statistical support from the performed Spearman's Correlation Coefficient test,  $r_s = .08$  and a 1-tailed significance value of  $p = .3$ . Hence, as the attained significance value was far from the required 95% probability, the result clearly indicates that no statistically verifiable relationship between extensive internationalization and higher sales growth could be

corroborated from the sample. Thus, it can be presumed that the underlying assumptions regarding the sample firms' collective necessity or desire to internationalize could have been flawed.

## **5.6 Limitations of the analysis**

As a quantitative analysis, the present research attempts to infer relationships from a sample to the entire population of comparable start-ups. However, because no sample can truly be an exact representation of any population, all of the attained results can be false due to measurement errors in spite of stringent probability value requirements. Hence, the used  $p < .05$  significance thresholds are considered to provide an approximation from the sample that would be true in a matching population with at least 95% certainty. This means that the hypotheses that were rejected with significance levels exceeding the  $p < .05$  limits can actually be accurate for the population, but the association could not be validated with sufficient statistical certainty from this particular sample. Likewise, results that indicate a probability of over 95% for the hypotheses to be correct can also be erroneous in the population.

Other limitations that could have potentially led to inaccurate findings include the relatively small sample size of 61 start-ups, the augmented effect of missing data for such a small sample, as well as, possible issues related to accuracy of the variables as truthful measurements of the factors they were instituted for. Moreover, the  $\pm .1$ ,  $\pm .3$  and  $\pm .5$  thresholds that were used to determine the effect size  $r$  do not have robust scientific backing and as such are considered as rather tentative and crude estimations of the actual effect sizes.

## 6 CONCLUSIONS

As Born Global firms have become important drivers of new economic growth over the past two decades, the topic of early and rapid growth and internationalization has gained significant traction and attention from academics, policy makers and business executives around the world. Aptly, ensuing research on the topic has sought to identify how and why an increasing number of start-ups are able to grow and internationalize at such an early stage and rapid pace despite being hamstrung by their lack of size, experience, and prior international presence (Zahra, 2005). Of the various challenges identified from the abundant research, the copious lack of financial and knowledge resources are often cited (Freeman et. al., 2006). Although notable strides have since been made in understanding the determinants behind Born Global success, still numerous factors remain largely unproven or sufficiently tested. In particular, the amount of quantitative studies testing and validating the assumptions and theorems generated by the ample qualitative research in the field of Born Global research remains rather limited. Thus, to partially cover this perceived research gap and problem regarding the factors contributing to Born Global growth and internationalization, the following overarching research question was formed and answered.

*What is the impact of the external factors of equity-based funding, venture capital, international social capital and public internationalization support on the growth and internationalization of Finnish technology-based start-ups with global aspirations?*

Accordingly, the conducted research quantitatively examined and tested the impact of four external factors on the performance of recently established Finnish technology start-ups. The chosen external factors were equity-based funding, independent venture capital, international social capital and public internationalization support. First, in order to gain a better understanding of the aspects contributing to the early and rapid growth and internationalization of start-up firms, literature on the Born Global firm, external funding, venture capital, and social capital was covered. From this reviewed literature, 11 hypotheses regarding the identified factors were contrived and

subsequently tested on a sample of 61 Finnish technology start-ups using quantitative methods of non-parametric design. The results of the hypothesis testing substantiated the hypothesized positive impact for venture capital and international social capital, whereas equity-based funding and public internationalization support did not receive sufficient statistical support.

### **6.1 Theoretical contribution**

The theoretical contribution of this study to Born Global research is manifold. First off, this present research adds to the plentiful knowledge on the external factors and their impact on Born Global growth and internationalization. Secondly, the research extends the Born Global growth and internationalization literature by adjoining the existing work in the discipline with associated private equity, venture capital, and social capital research. Finally, this work also extends the contemporary research on the effects of external equity-based funding, venture capital, international social capital, and internationalization assistance to the particular business setting of Finland.

Eleven hypotheses were contrived from various assumptions and theorizations of prior research relating to each of the identified factors. These hypotheses were then tested using non-parametric methods of quantitative analysis on the sample of 61 Finnish technology start-ups. The first three hypotheses (H1, H2, & H3) dealt with the impact of public internationalization support, which was represented by the project, on start-up performance. H1 and H2 investigated whether project participation was connected with improved sales growth and internationalization ratios. On both accounts, no statistical support was obtained to corroborate hypothesized notions. In similar fashion H3 addressed the effect of the project on the participant firms' ability to attract external resources in the form of equity funding, venture capital, and international top management involvement. For all of the above-mentioned hypotheses, the quantitative testing could not validate the projects hypothesized advantage in comparison to the firms that were rejected during the application process. Hence, for the first set of hypotheses, no inferences on the capacity of public internationalization support in expediting sales growth, internationalization, or resource acquisition were made.

H4 explored the effect imparted by external equity funding irrespective of investor type on the sales growth of the sample start-ups. As was the case with the first three hypotheses, H4 gained no statistical support and consequently no inference regarding the positive impact of having accrued equity-based capital from external investors was made. This negative outcome for the hypotheses, however, corroborated the notion that capital on its own is not a significant enough factor to adequately explain performance differences amongst otherwise similar start-ups.

Hypotheses 5, 6, 7 and 8 examined the impact of independent venture capital funding on the growth and internationalization of Finnish technology start-ups. Of these four hypotheses, three received explicit statistical support, which largely validated the hypothesized claims that attracting external funding from professional venture capitalists enhances both the sales growth and the internationalization of new ventures. H6 was the only hypotheses of the four that did not gain statistical backing, as the attained significance value was short of the required threshold. However, although the impact of independent venture capital on sales growth was not identified to sufficiently differ from other forms of equity funding, the overall statement regarding the advantages of venture capital funding on the growth and internationalization of Finnish Born Globals received enough support to be comfortably upheld.

The subsequent hypotheses (H9 & H10) concerned the influence of having international participation in the top management of a start-up on subsequent sales growth and internationalization outcomes. These hypotheses were developed on notions from prior social capital research, which argued that foreign top managerial participation would increase the overall knowledge and total social capital of a firm through the non-overlapping and predominantly international networks of connections they supposedly would have. The advantageous effect of international social capital received statistical support in both cases, thus, validating the benefits of having non-overlapping and international networks of connections, as well as, diverse management teams on Born Global sales growth and internationalization.



The last hypotheses addressed the conceived notion that increased sales growth would be positively associated with greater internationalization ratios and vice versa for Born Global start-ups. However, this final claim did not receive statistical backing and no connection between improved sales growth and advanced internationalization could be inferred. It needs to be kept in mind that even though some of the hypotheses were not statistically supported, these negative outcomes do not necessarily mean that the hypothesized relationships do not exist, only that with this data sample no such affiliation can be statistically confirmed.

In addition to the conclusion that were reached from the performed statistical analysis, this research extends the existing literature on the impact of equity funding, venture capital and social capital on the performance of SMEs to the specific domain of Born Global research. Hence, adjoining these normally distinct streams of research into the study of Born Globals and testing the formed hypotheses, new insights and knowledge on the impact of the external factors is gained. Furthermore, the present research extends the current literature and knowledge base on the contributory factors of Born Global growth and internationalization by carrying out the statistical analyses on technology start-ups originating from Finland. Altogether, new knowledge on the role of external funding, venture capital, international social capital, and public internationalization support on the growth and internationalization of start-ups was produced and inferred from the sample to the population of similar Finnish and SMOPEC technology-based new ventures.

## **6.2 Managerial implications**

From the present research, the following managerial implications are concluded. The findings demonstrated with statistical weight that on average accruing independent venture capitalist funding and international top management participation in start-ups produces greater sales growth and internationalization results. Hence, it can be advocated that in order to grow a business both domestically and globally, start-ups should look to attain funding from independent venture capitalists, as well as, have multinational top management teams in order to maximize their sales growth and

internationalization performances.

However, due to the exploratory form of this study, these inferences are only applicable at an aggregate level and consequently cannot be considered as certainties for individual start-ups. Hence, for managers the accrual of venture capital or having international participation in the top management team should not be goals as such nor do they implicitly result in better performance, but on average both factors should ultimately produce greater sales growth and internationalization performance in Finnish technology-based startups. Moreover, causal relationship between capital investments or specific network connections on start-up performance cannot be proven, however, on average the positive effects and benefits of venture capital and international social capital on the growth and internationalization of Born Globals are substantiated. Thus, when sales growth and internationalization are key management objectives, gaining investments from independent venture capitalists and involving multicultural participants in top management teams are strongly advocated. Nevertheless, other considerations, such as the retention of control and the allocation of ownership, can abstain founders or top management in their desire to seek or add such contribution from external parties in spite of their authenticated advantageous effect.

Although, the hypothesized connections between public internationalization support and external equity funding irrespective of source on the sales growth and internationalization performance of start-ups did not receive robust statistical backing, managers should not withhold from pursuing or taking advantage of either factor because of the outcome. For both variables, the attained descriptive statistics positively favored the benefits of accruing external funding or receiving public internationalization support. Hence, despite not being able to prove a significant impact from the sample, with the support of both the descriptive figures and the prior academic literature it can be gathered that the effect of external funding and public internationalization assistance on the growth and internationalization of start-ups, though not large or uniform, is definitely not negative nor entirely inconsequential.

On a broader level, the descriptive statistics and the quantitative analyses of the factors jointly endorse the overall perspective of international business and entrepreneurship research, wherein the more financial, knowledge, and network resources a company has at its disposal, the more likely it is to succeed in its early and rapid growth and internationalization. Accordingly, it can also be identified that each of the selected factors brings or grants access to different amounts of the beneficial capital, knowledge, and social assets, which explains the differences in the impact and advantages that these factors provide Born Global firms with.

### **6.3 Suggestions for future research**

By extending the concepts of equity and venture funding, social capital, and public internationalization assistance to the study of start-up growth and internationalization, this research in part helps to cover the research gap relating to the various external influences and aspects that factor into Born Global growth and internationalization performance. Albeit, the literature on and around this topic has expanded significantly over the past decades, numerous theoretical and empirical streams for further research still persist. For one, the selected factors of growth and internationalization, namely public internationalization support, equity-based funding, venture capital and international social capital only represent a share of the numerous internal and external dynamics that can enhance start-up growth and internationalization. Although, the various influences to organizational growth have been well identified and discussed in prior research, many of them have not been tested nor validated in relation to their impact on the early and rapid growth and internationalization of Born Global ventures.

Hence, to further improve our understanding of the factors influencing growth and internationalization performance and the extent of their effect on Born Globals, more quantitative analysis and longitudinal studies are required to verify the prior theoretical propositions and conceptualizations. In addition, paired studies combining both quantitative and qualitative methods should be conducted, as these methods can combine to produce both qualitative individual level findings, as well as, aggregate effects to support the perceived notions. Such results that combine both the qualitative

and quantitative can help in providing more focused and in-depth managerial insights. Moreover, employing both research methods in the form of multiple case studies could provide a more holistic view of the extent of the impact that the various factors have.

Another interesting stream of enquiry could be to examine the interaction between various factors of growth and internationalization. For instance, investigating the respective impact of equity-based investments and venture capital in cultivating additional international ties and contacts, as well as, inversely analyzing the potency of international social capital in attracting external funding to the start-ups could provide further knowledge on the relative impact of one factor in attaining another. Furthermore, studying individual factors of start-up growth and internationalization in more detail could strengthen our understanding of how each external and internal variant actually supports new venture growth and international expansion. In practice, this would entail analyzing various subdivisions for each factor. For example, in the case of external funding the analysis would involve investigating the effects of the amount invested, the added network connection, as well as, the received value-adding support from the funding on the growth and internationalization of the start-ups.

Furthermore, to validate the present study and to expand our current knowledge on Born Globals and their development, further research using the same or similar variables is encouraged. Replicating the present research with different samples, in other national or regional business settings, as well as, within specific industry or technology parameters could further validate and generalize the impact of the factors or present contrary information in relation to Born Global growth and internationalization. Likewise, extending the time frame of the study to encompass the later stages of start-up development could aid in developing our understanding of the long-term effects of the factors and whether their ability to facilitate growth and internationalization changes as companies advance past their early stages. Furthermore, supplemental theoretical work on the variables used to adjudge Born Global growth and internationalization is needed. Despite their widespread use, absolute sales growth and internationalization ratio cover only two facets of organizational performance. Thus, due to the heterogeneous nature and divergent growth strategies of Born Global firms, the analysis of Born Global

performance should incorporate other performance indicators as well. By discussing and applying other measures of organizational performance into the analysis of Born Global growth and internationalization, a more comprehensive understanding of what constitutes as Born Global growth and how it should be measured can be attained.

Finally, this research should in part prompt further discussion and research on the topic of early and rapid internationalization in Born Globals. With Born Global start-ups continuing to increase their foothold in the global economy and with the global business environment in constant state of change, continued research on the determinants of Born Global and new ventures performance is required to support managerial decision making, shape economic policy and public initiatives, as well as, broaden and update our understanding of the entrepreneurial firms that will drive economic growth over the coming decades.

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## APPENDICES

### APPENDIX 1: List of companies accepted into the BornGlobal™ project

<b>Panel date</b>	<b>Company</b>	<b>Panel date</b>	<b>Company</b>
12.10.2006	<b>Movial Oy</b>	14.06.2007	<b>Imbera Electronics Oy</b>
12.10.2006	<b>Wireless Technologies Oy</b>	14.06.2007	<b>Biozone Scientific International Oy</b>
12.10.2006	<b>Netseal Mobility Technologies Oy</b>	19.06.2007	<b>Innohome Oy</b>
15.11.2006	<b>Pintavision Oy</b>	19.06.2007	<b>WinfoMedia Oy</b>
15.11.2006	<b>ReachWay Oy</b>	22.08.2007	<b>Beddit Oy (ex. Finsor Oy)</b>
04.12.2006	<b>FogScreen Oy</b>	04.09.2007	<b>Senseg Oy</b>
04.12.2006	<b>Flowman Oy</b>	04.09.2007	<b>7signal Oy</b>
19.12.2006	<b>Voyantic Oy</b>	04.09.2007	<b>Lekane Oy</b>
19.12.2006	<b>Optomed Oy</b>	04.09.2007	<b>Voimaradio Oy</b>
04.01.2007	<b>Relex Oy</b>	19.09.2007	<b>WOT Services Oy (ex. Against Intuition Oy)</b>
04.01.2007	<b>Icareus Oy</b>	19.09.2007	<b>EpiCrystals Oy</b>
24.01.2007	<b>Ironstar Helsinki Oy</b>	19.09.2007	<b>Aito Technologies Oy</b>
13.02.2007	<b>Kennotech Oy</b>	02.10.2007	<b>Floobs Oy</b>
13.02.2007	<b>Footbalance Systems Oy</b>	02.10.2007	<b>Openbit Oy</b>
13.02.2007	<b>Helmi Technologies Oy</b>	02.10.2007	<b>Golf Island Oy</b>
28.02.2007	<b>Virtual Air Guitar Company Oy</b>	17.10.2007	<b>Magnasense Oy</b>
28.02.2007	<b>Innosonic Oy</b>	21.11.2007	<b>Spinmade Oy</b>
28.02.2007	<b>Enfucell Oy</b>	21.11.2007	<b>Comeks Oy</b>
21.03.2007	<b>Iqua Oy</b>	21.11.2007	<b>DynaRoad Oy</b>
21.03.2007	<b>Targetor Oy</b>	21.11.2007	<b>White Vector Oy</b>
26.04.2007	<b>Eniram Oy</b>	19.12.2007	<b>Meshcom Technologies Oy</b>
26.04.2007	<b>Oy Core Handling Ltd</b>	19.12.2007	<b>Aspida Oy</b>
26.04.2007	<b>Supponor Systems Oy</b>	19.12.2007	<b>Severa Oy</b>
26.04.2007	<b>Evalua International Ltd Oy</b>	16.01.2008	<b>Mobile SafeTrack Oy</b>
02.05.2007	<b>Xtract Oy</b>	27.02.2008	<b>Whatamap Oy</b>
02.05.2007	<b>JM Tieto Oy</b>	27.02.2008	<b>Softconnection Oy</b>
02.05.2007	<b>Ipsat Therapies Oy</b>	27.02.2008	<b>Ball-IT Oy</b>
22.05.2007	<b>PlexPress Oy</b>	12.03.2008	<b>VividWorks Oy</b>
22.05.2007	<b>Miradore Oy (ex. DCM Global Oy)</b>	16.04.2008	<b>TVKaista Oy</b>
14.06.2007	<b>Envault Oy (ex. Splitstream Oy)</b>	16.04.2008	<b>Enercomp Oy</b>