



# A dynamic model of growth phases and survival in international business-to-business new ventures: The moderating effect of decision-making logic



Peter Gabrielsson <sup>a,c,1</sup>, Mika Gabrielsson <sup>b,c,\*</sup>

<sup>a</sup> Department of Marketing, University of Vaasa, P.O. Box 700, FI-65101 Vaasa, Finland

<sup>b</sup> Department of Business, University of Eastern Finland, P.O. Box 1627, FI-70211 Kuopio, Finland

<sup>c</sup> Department of Management and International Business, Aalto University School of Business, Helsinki, Finland

## ARTICLE INFO

### Article history:

Received 29 October 2012

Received in revised form 28 June 2013

Accepted 4 July 2013

Available online 12 August 2013

### Keywords:

International new ventures

Born globals

Growth

Survival

Effectuation

## ABSTRACT

The growth and survival of international new ventures (INVs) has not been the subject of extensive in-depth qualitative study and our understanding of their decision-making is deficient. On the basis of empirical analyses in a small and open economy, a dynamic model was developed that explains the growth phases through which INVs pass as they mature in the high-technology business-to-business field. The model also recognizes rapid advancement, survival crises, and retrenchment. Propositions were devised regarding the impact of opportunities, resources and capabilities, entrepreneurial orientation, and learning on growth phases and survival. A novel finding is that the decision-making logic moderates the impact of these factors. These findings have important implications for industrial marketing scholars and practitioners.

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## 1. Introduction

International new ventures (INVs) have received increasing attention from a number of researchers. Much of this research has focused on the early years of INVs (see e.g. Chetty & Campbell-Hunt, 2004; Knight & Cavusgil, 1996; Madsen & Servais, 1997). Nevertheless, its contribution to our understanding of the global growth and survival of INVs (Mudambi & Zahra, 2007; Sapienza, Autio, George, & Zahra, 2006) and their decision-making has been limited (Saravathy, 2001). INVs are an especially interesting group of firms as they have been able to internationalize rapidly and market their offering globally. This is challenging and thus this knowledge is expected to be valuable for industrial marketing researchers and firm managers.

In the management literature a number of multistage models have been proposed in which predictable patterns in the growth of organizations are assumed to exist (Greiner, 1972; Kazanjian & Drazin, 1989; Massey et al., 2006; McMahon, 2001). These earlier models have been criticized for being too sequential and linear (Levie & Lichtenstein, 2010; Phelps, Adams, & Bessant, 2007) and it has been proposed that development should be seen as changes in dynamic states, i.e. as a series of

configurations. Earlier research on the internationalization of firms found patterns in the stage-wise progression of companies towards greater foreign market involvement (Johanson & Vahlne, 1977; Luostarinen, 1979). However, it has been argued that these models are not applicable in today's global environment, that small companies proceed more rapidly to international markets (Oviatt & McDougall, 1994), and that this is particularly true of business-to-business firms (Laanti, Gabrielsson, & Gabrielsson, 2007). Recent research has suggested that international growth is pursued within business networks and that the process is driven by knowledge of opportunities abroad instead of by efforts to overcome uncertainties concerning institutional conditions in foreign markets (Johanson & Vahlne, 2009).

International new venture theory emphasizes the importance of unique entrepreneurial characteristics such as innovativeness, proactiveness, and risk-taking, all of which allow firms to identify and address foreign growth opportunities and leverage the network resources necessary for rapid growth (McDougall, Shane, & Oviatt, 1994). They do not, however, adequately explain the decision-making of INVs. Some researchers have argued that we need to go beyond theories of the firm and include the entrepreneurs in the investigation (Saravathy, 2004). We expect that inclusion of considerations related to entrepreneurial decision-making may be especially fruitful as it has been argued that INVs often operate in a three dimensional problem space (Andersson, 2011; Saravathy, 2004) consisting of Knightian uncertainty (Knight, 1921), Marchian goal ambiguity (March, 1976), and Weickian enactment (Weick, 1979). This means that the future is unpredictable, goals are unspecified or unknown, and decisions made by INVs may affect the environment. All three of these considerations

\* Corresponding author. Tel.: +358 50 568 7626.

E-mail addresses: peter.gabrielsson@uva.fi (P. Gabrielsson),

mika.gabrielsson@uef.fi (M. Gabrielsson).

<sup>1</sup> Tel.: +358 29 449 8434.

can be expected to influence how entrepreneurs decide about issues related to growth and survival (Saravathy, 2004). The ability of INVs to make decisions is limited by their imperfect knowledge and their goal-setting, which is at best satisfactory (Simon, 1947). Hence, new theory development would benefit from capturing the decision-making logic used in INVs that operate in an uncertain environment (Saravathy, 2001). Effectuation theory, an approach to entrepreneurial expertise based on cognitive science that can be placed under the larger umbrella of decision-making under uncertainty, has the potential to address this gap (Jones, Coviello, & Tang, 2011; Read, Dew, Saravathy, Song, & Wiltbank, 2009). We expect that understanding of the decision-making logic may reveal how INVs are able to meet the huge challenge of global growth problems and survival crises despite their liabilities regarding newness, size, and foreignness (Zahra, 2005). Effectuation logic, which emphasizes improvisation, exploitation of contingencies and market creation through alliances and partnerships, offers great hopes in this respect (Saravathy, 2001) due to its potential to mitigate resource requirements. Recent research has also emphasized the importance of understanding decision-making in business-to-business contexts (Forkmann, Wang, Henneberg, Naudé, & Sutcliffe, 2012). Due to small home markets and limited trade barriers that force rapid internationalization, INVs are more likely to originate in small and open economies (SMOPEC) than in larger countries (Fan & Phan, 2007). Moreover, as INVs have been found more often in the high-tech (Autio, George, & Alexy, 2011) and business-to-business field (Laanti et al., 2007), we decided to develop initial insights in this context. Hence, the research objective is to develop a dynamic model explaining the growth and survival of high-tech business-to-business INVs originating in small and open economies from the perspective of decision-making logic.

This research defines INVs in keeping with Oviatt and McDougall (1994, p.49), who originally defined them 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.” Other researchers have operationalized this by setting criteria for the rapidity of foreign market entrance and the degree of exports. A cut-off of 25% (Knight & Cavusgil, 1996, 2004) and three years (Zhou, Barnes, & Lu, 2010) has commonly been used. Hence, to qualify as an INV in this research, foreign sales had to account for 25% of total sales within three years of foundation. Moreover, it is important to note that few researchers have measured the extent to which international new venture firms grow beyond the initial export phase to become global firms (Chetty & Campbell-Hunt, 2004; Lopez, Kundu, & Ciravegna, 2009).

The article addresses the debate around whether a model can be developed for international new venture growth (Oviatt & McDougall, 1994) and survival (Mudambi & Zahra, 2007). The contribution of our study to business-to-business marketing and entrepreneurship research is two-fold; we provide an explanation of the phases through which business-to-business INVs evolve as they mature and then develop a dynamic model explaining this process, including the effects of decision-making logic. The model advances our understanding of the impact of resources and capabilities on growth and survival (Sapienza et al., 2006). It highlights the crucial role of opportunities in driving growth (Alvarez & Barney, 2007) and the importance of learning for survival (March, 1991). It also contradicts much of the existing wisdom according to which an entrepreneurial orientation is mainly beneficial (Lisboa, Skarmeas, & Lages, 2011). Earlier research results have shown that a stronger international entrepreneurial orientation drives INVs to develop the high-quality goods that are associated with international success (Knight & Cavusgil, 2004). In contrast, our research suggests that it is not always beneficial to have a strong international entrepreneurial orientation. A novel finding is the importance of effectuation logic as a moderator that either accelerates or mitigates the influence of antecedent factors on the growth and survival of INVs in the high-technology business-to-business field.

## 2. Conceptual foundation

### 2.1. Growth phases and survival of INVs

INVs grow and internationalize rapidly by focusing on a few unique resources leveraged on foreign markets with alternative governance methods (Oviatt & McDougall, 1994) such as strategic alliances and networks (Coviello, 2006; Coviello & Munro, 1995). Enabled by faster learning capabilities (Autio, Sapienza, & Almeida, 2000), INVs have been found to grow rapidly into foreign markets. In this context an innovative culture and also knowledge and capabilities have proved important for growing into diversified foreign markets (Knight & Cavusgil, 2004). Knowledge drives firms to enter foreign networks and identify and exploit opportunities abroad (Johanson & Vahlne, 2009), whereas capabilities are required to solve growth-related problems and overcome survival crises. Hence, the growth of INVs is best understood as a process of the entrepreneurial internationalization behavior of decisions, processes, and activities (Jones & Coviello, 2005).

Recent international new venture literature has called for examination of the fingerprints and patterns over time (Jones & Coviello, 2005). The growth of organizations over time has been examined in the management literature by a number of authors who have proposed that organizations grow in stages. These models share some common features and an underlying logic in which stages emerge in a well defined sequence so that the organization evolves on the basis of solutions to sets of problems or tasks (Kazanjian & Drazin, 1989; Scott & Bruce, 1987) or through periods of steady growth and evolution to the next stage (Greiner, 1972). There is increasing criticism regarding the number of stages, linearity, and characteristics of these earlier models (Levie & Lichtenstein, 2010). These models have also been highly descriptive rather than analytical with respect to the factors driving growth. An important finding illustrated in some earlier models is that survival is at stake in all phases and that companies can fail at any point during their growth if they do not manage crises successfully (Churchill & Lewis, 1983). Although earlier models have increased our knowledge about this growth, they have failed to consider that companies not only grow in size, but increasingly in the global direction as well.

Recent international new venture research has also argued that these firms evolve in phases (Coviello, 2006; Park & Bae, 2004; Rialp-Criado, Galván-sanchez, & Suárez-Ortega, 2010). For instance Coviello (2006) applied the life-cycle model developed by Kazanjian and Drazin (1989) in investigating network development and dynamism in INVs originating from New Zealand. The development can also be seen as an entrepreneurial process that extends across national boundaries including (1) the discovery of new opportunities, (2) the deployment of resources in the exploitation of these opportunities, and (3) engagement with competitors (Mathews & Zander, 2007). Also, an interesting recent study has suggested that born globals develop in three distinct phases: opportunity recognition and INV creation, growth and resource accumulation, and break-out (Gabrielsson, Kirpalani, Dimitratos, Solberg, & Zucchella, 2008). Furthermore, a configuration-holistic approach to born global development has been proposed in which firms evolve through distinctive phases (Rialp-Criado et al., 2010): pre-start-up/venture creation, pre-internationalization, and post-internationalization. Earlier research has found that INVs may face de-internationalization and re-internationalization (Benito & Welch, 1997). In light of earlier criticism of lifecycle models, more dynamic models should be developed to depict the behavior of INVs over time; these models should take into account problems associated with growth and survival and also allow for retrenchment.

As earlier research has noted, it is not only important to study the growth of INVs, but also their survival (Mudambi & Zahra, 2007; Sapienza et al., 2006). According to Zahra (2005), there is little research in particular regarding how INVs grow to become established

and survive. This is important because we know that INVs have a number of liabilities that affect their survival. First, they experience the liability of foreignness with regard to their foreign local competitors (Zaheer & Mosakowski, 1997) and second, they experience the liability of newness with regard to already established firms (Stinchcombe, 1965), and finally their small size has an adverse effect (Zahra, 2005).

## 2.2. Theoretical approaches explaining the growth and survival of INVs and their decision-making

To understand what INVs become when they grow up, we need to examine the theoretical approaches related to their growth and survival (c.f. Sapienza et al., 2006). Oviatt and McDougall (1994) contend in their ground-breaking work that entrepreneurship theory and a resource-based view explain INV development to some extent. Moreover, learning (Johanson & Vahlne, 1977) and knowledge of opportunities (Johanson & Vahlne, 2009) explain international expansion. While this is a useful starting point, we also need to consider the decision-making of the entrepreneurs (Cyert & March, 1963; Sarasvathy, 2001; Simon, 1947) to fully understand growth and survival of INVs.

### 2.2.1. Resources and entrepreneurial orientation affect the growth and survival of INVs

The resource-based view (Barney, 1991; Grant, 1991; Penrose, 1959; Wernerfelt, 1984) guides us to suggest that resources play a critical role in the growth and survival of INVs. The existence of sufficient resources for entrepreneurial and managerial services related to planning of expansion is particularly important (Penrose, 1959). Since INVs often suffer from resource limitations (Oviatt & McDougall, 1994), the amount of resources (Hannan, 1998) and the dynamic capabilities (Autio et al., 2011; Sapienza et al., 2006) become central in understanding growth and survival. Resources do not provide growth for INV firms if they lack the capability to deploy and co-coordinate them (Verona, 1999). We distinguish between substantive capabilities that can be seen as a set of abilities and resources which go into solving a problem or achieving an outcome and dynamic capabilities that refer to a dynamic ability to change or reconfigure existing substantive capabilities (Zahra, Sapienza, & Davidsson, 2006). Firms can achieve long-term growth only if their capabilities are both substantive (technology, marketing) and dynamic (Zahra et al., 2006). Internal development of these capabilities is not necessary, as networks are increasingly important sources of resources; firms may learn about new opportunities and access their partners' capabilities by entering foreign networks (Johanson & Vahlne, 2009). Hence, earlier INV literature has also found that the capabilities of network actors are important for the growth of INVs (Park & Bae, 2004; Sepulveda & Gabrielsson, 2013; Zhou et al., 2010).

When INVs enter foreign markets they need to create routines and adapt to them (Sapienza et al., 2006). Due to the liabilities of foreignness (Zaheer & Mosakowski, 1997) and newness (Stinchcombe, 1965), this may require substantial investment (Zott, 2003). Hence, Sapienza et al. (2006) propose that internationalization decreases the potential of INVs to survive. They can secure survival if they are able to obtain venture capital or other endowments from their founders (Hannan 1998) or government (Mudambi & Zahra, 2007). They may also use network resources to enhance their competitive advantage and prospects for long-term survival (Lavie, 2006; Sepulveda & Gabrielsson, 2013). The costs associated with creation of new routines are likely to decrease over subsequent entries as organizations learn from experience. We can conclude that accelerated internationalization involves significant risks (Shrader, Oviatt, & McDougall, 2000). This is in fact the gist of the stage-wise internationalization model (Johanson & Vahlne, 1977; Luostarinen, 1979). It is less risky to follow the stages model by gradually accumulating knowledge than to proceed more rapidly to foreign markets.

Moreover, the entrepreneurial orientation is expected to affect firm growth and survival. Here the concept refers to proactive, innovative,

and risk-taking firm behavior that contributes to successful entry (Knight & Cavusgil, 2004; Lumpkin & Dess, 1996; Miller, 1983). Proactiveness can be defined as processes aimed at anticipating or acting on future needs, while innovativeness is reflected in a tendency to engage and support new ideas, novelty, and creative processes that may result in new products or services. Risk-taking is seen in the proclivity to engage in risky projects and bold acts to achieve its objectives (Lumpkin & Dess, 1996). International entrepreneurship research emphasizes that a strong entrepreneurial orientation is essential for sales growth (Zhou et al., 2010); it may affect performance and thus be critical for an understanding of firm survival (Rauch, Wiklund, Lumpkin, & Frese, 2009).

### 2.2.2. Decision-making logic related to growth and survival of INVs

Decision-making can be investigated at two levels: firm-level internationalization decisions and actor-dependent entrepreneurial decision-making. The internationalization process models developed on the basis of the theory of business decision-making (Cyert & March, 1963) depict internationalization as a series of incremental decisions where the firm adapts to changing condition, both internal and external. By gaining experimental knowledge, firms may gradually expand to countries at greater psychic distances (Johanson & Vahlne, 1977). Some recent literature suggests that it is less important to overcome barriers related to psychic distance between the home and host country and that instead, firms should seek increasingly to strengthen their position in foreign networks (Johanson & Vahlne, 2009). Moreover, analyses should not be carried out at firm-level alone, as entrepreneur probably have a major influence on global growth and survival decisions in INVs (Andersson, 2011). The effectuation theory of entrepreneurial decision-making takes us closer to the entrepreneurs and how they face uncertainty (Read, Dew, et al., 2009). According to this theory, entrepreneurial decision-making may be understood as an 'effectuation process' in which a set of means are taken as given and the focus is on selecting between the effects that can be created with that set of means. This is contrary to the 'causation process,' in which a particular effect is given and the focus is on selecting between the means which create that effect. (Sarasvathy, 2001) Causation and effectuation are thus two alternative logics used by entrepreneurs to make growth-related decisions (Sarasvathy, 2001). While causation logic sees the environment as largely beyond the control of the decision-maker, who therefore attempts to predict and adapt to changes in it, effectuation logic rests on the contention that the environment is endogenous to the actions of 'effectuators,' who therefore attempt to co-create it through commitments with a network of partners and stakeholders (Read, Dew, et al., 2009). Causation is therefore consistent with planned strategy approaches while effectuation is closer to emergent or non-predictive strategies (Chandler, DeTienne, McKelvie, & Mumford, 2011; Mintzberg, 1978).

The decision-making logic is also different if entrepreneurial actions related to growth and survival seem based on discovery or creation theories (Alvarez & Barney, 2007). When opportunities due to exogenous shocks in the environment are discovered, the decision-making context appears risky because growth opportunities are objective in nature and independent of entrepreneurs. Entrepreneurs can scan the environment to discover opportunities for growth and then use a variety of data collection and analysis techniques to understand the outcomes and probabilities related to decisions about whether to pursue these opportunities. Here a causation type of decision-making logic may be more effective. However, when the growth opportunities are created endogenously by the actions, reactions, and enactment of entrepreneurs, the decision-making context is uncertain. At the point of decision-making, the possible outcomes and their probabilities are unknown. Contexts of this type would call for effectuation logic, which is more iterative and incremental and considers affordable loss when making growth-related decisions and solving problems associated with them. (Alvarez & Barney, 2007)

We expect that effectuation theory may be especially important for this study, as it has the potential to provide a robust and rigorous way of understanding entrepreneurial decision-making and integrates the existing management theories, which do not quite fit into an explanation of INV growth and survival. Effectuation theory can be valuable in integrating the above theories explaining growth—in particular, how entrepreneurs use the effectuation process in their decisions. The decision-making process starts with the existing means, i.e. with the entrepreneurial orientation, the knowledge of opportunities, and the resources and capabilities of the entrepreneur; effectuation is about selecting the desirable effects that can be achieved with these means, i.e. growth outcomes in international markets (Read, Dew, et al., 2009; Sarasvathy, 2001). Moreover, effectuation theory offers the potential to integrate and better understand the effect of resources, capabilities, entrepreneurial orientation, and learning on survival. The decision-making logic applied in effectuation is expected to differ from that applied in causation. Entrepreneurs using effectuation invest less in their own resources and capabilities and use those offered by partners. They use emerging contingencies effectively and operate on the principle of affordable loss. This means that these firms operate more on the basis of improvisation (Prashantham & Floyd, 2012) with little sunken cost, and learn quickly whether the direction chosen was the correct one. Some authors have argued effectuation logic can manage crises more effectively and create larger and more successful firms (Sarasvathy, 2001).

### 3. Research methodology

The multiple case study method was selected for this research. It is particularly appropriate as the research questions are of the “how” and “why” types. The study is of an explanatory nature (Yin, 2009: 9). The method is appropriate for this investigation as there has been little research on decision-making associated with the growth phases of INVs and the factors influencing it (Eisenhardt & Graebner, 2007). The selected case study utilizes an embedded design, i.e. a multiple level of analysis focusing on each firm at two levels: (1) firm-level growth phase and survival and (2) entrepreneur-level decision-making logic. Although embedded designs are often complex, they help us find reliable models through abductive analysis and increase our understanding of the relationship between the variables. (Eisenhardt, 1989; Yin, 2009) Thus, the study adopts the idea of abduction through back and forth interaction between theory, empirical data collection, and case study analysis (Dubois & Gadde, 2002). The multiple case study design allows for logical replication and the results are expected to be more convincing. The cases were selected on the basis of theoretical sampling logic so that they are particularly appropriate for understanding complex relationships and logic among constructs (Eisenhardt & Graebner, 2007). It was decided to focus on high-tech companies, since this would allow us to control for differences related to industry type. Moreover, we decided to study firms originating from a small and open economy. We considered Finland a typical country of this type, as its population is about 5 million

and there are very few trade restrictions, particularly in the high-technology field. To select the case companies, the authors familiarized themselves with public sources on Finnish INVs and with an internal database of all known INVs in Finland maintained by the university with which they are affiliated. Hence, the case companies were selected to meet the following criteria based on theoretical sampling logic (Yin, 2009): (1) they were to be INV firms (with exports accounting for 25% of sales within 3 years of foundation), (2) they had to originate in Finland (a typical SMOPEC country), (3) they were to be business-to-business companies (their customers are companies instead of consumers) and (4) high-tech companies (more than 5% of turnover is invested in R&D), (5) they had to exhibit a variety of growth behavior, including non-linear development and non-survival. Four cases were selected using the above principles: Vacon, Biohit, Tectia, and Terapixel.

In gathering empirical data triangulation was applied by using multiple sources of evidence in all cases. The primary data for the analysis were collected from in-depth interviews with the founders, CEOs, or senior management of the firms. The interviews were semi-structured and began with open questions. Altogether 21 interviews were conducted in 2000–2011. This allowed us to observe the case firms for several years, thereby decreasing the potential for recall problems. The interviews were recorded and transcribed and a database was created to help maintain the planned case study protocol and ensure validity. Most of the interviews were conducted by the authors of this paper and those that were not were conducted by trained researchers under the supervision of the author/s. Company presentations, financial data, earlier studies, and news releases from the foundation of the case firms up to the present were used to provide additional support. See Table 1.

The analysis relied on explanation-building logic that can be seen as a special case of pattern matching (Yin, 2009: 141–144). The idea is that the final explanation may not be stipulated from the very beginning. Several iterations are made by analyzing the findings of a single case and subsequently extending the comparison across cases. After analyzing each case, we developed a meta-matrix that permitted systematic comparison of the findings across cases (Ghauri, 2004; Miles & Huberman, 1984). The growth phases of each case firm were identified on the basis of dominant problems (Kazanjian & Drazin, 1989) and these findings were replicated across cases to find a common stages model. The factors influencing growth and survival were sought by using the above-described explanation-building logic, first within cases and then across cases. If these findings were alike it could be concluded that replication had occurred. After several rounds of iteration, development was possible of a theoretical dynamic model and propositions that were sufficiently systematic to be accepted (Ghauri & Gronhaug, 2005). The analysis was facilitated with Nvivo software to categorize and organize the research data (Sincovics, Penz, & Ghauri, 2008).

Validity was increased by applying multiple sources of evidence, which provided multiple measures of the same phenomenon (Yin, 2009). This produces a more complete, holistic, and contextual portrait of the object under study (Ghauri & Gronhaug, 2005, p. 222). Furthermore, several people analyzed the results, a chain of evidence

**Table 1**  
Background of interviews and other sources of information.

Case firm	Number of interviews	Year of interview	Interviewed persons	Time period covered in interviews	Other sources of information
Vacon	2	2000	Founder & CEO; Vice president	1993–2000	Annual reports, press releases, internal documents, webpage
	3	2010–2011	CEO; Founder & Former CEO; Vice President	2001–2010 (+ earlier time)	
Biohit	2	2000	Founder & CEO; manager	1988–2000	Annual reports, press releases, internal documents, webpage
	7	2009–2011	Founder & CEO; Vice Presidents; Director; Sales manager	2001–2010 (+ earlier time)	
Tectia	1	2005	CEO	1995–2005	Annual reports, press releases, internal documents, webpage
	3	2009–2010	Founder; President; Former President	2006–2010 (+ earlier time)	
Terapixel	1	2000	Founder & President	1990–2004 (Bankruptcy in 2004)	Annual reports, press releases, internal documents
	2	2010	Former CEO; Former President	2001–2005 (+ earlier time)	

was built, and explanation building logic was followed in the case analysis. Reliability was safeguarded through careful data collection and formation of a case database and by having key informants review the draft case reports.

#### 4. Empirical results, cross-case analysis and proposition development

##### 4.1. Background of the case firms

A brief background of the four case firms selected will be presented: (A) Vacon was founded in 1993 by 11 founders with extensive earlier MNC experience. The firm manufactures frequency converters for industrial purposes and it had a global vision from the beginning. Sales started in 1995 after the first product had been developed and by 1996 51% of its sales were already abroad (internationalization degree). Sales increased very rapidly and by 2010 it could be classified as a large-sized firm with sales of 338 million euros and 1339 employees. 80% of sales were already outside its domestic market and approximately 33% were outside its home continent. (B) Biohit was founded in 1988 by a doctor of medicine and deliveries of electronic pipettes started in 1990. The firm manufactures liquid-handling products and diagnostic test system. The vision from the beginning was to reach global markets. Foreign markets, mainly Europe and the USA, already accounted for 90% of sales at the beginning, in 1991. In 2010 net sales amounted to 40 million euros and 431 persons were employed; hence the company was becoming a large firm. The degree of internationalization was 97% and the degree of globalization 48%. (C) Tectia was founded at the end of 1995 by a student from a technical university and deliveries through the Internet of the first security software started immediately. By the third year of operation the degree of internationalization was already 56% and the degree of globalization was 38%. At the peak in 2001 the firm had 181 employees and net sales of 19.9 million euros. However, the sales and number of employees were reduced as a result of divestment of part of the business. In 2010 the firm employed 70 persons and had net sales of 9.1 million euros. The degree of internationalization has continued to increase since the divestment and has reached 95% with a globalization degree as high as 76%. (D) Terapixel was established in 1990 by a researcher who had developed an innovation while working at the Technical Research Center of Finland. It had a global vision from the beginning and the first delivery took place in Brazil in 1991. By the third year after establishment sales abroad accounted for 50% of the total and by the sixth year sales outside the home continent accounted for around 40%. The firm gradually expanded and by 2000 sales totaled 1 million euros and there were 12 employees. It therefore approached the criteria for small firm size. After this peak the sales and number of employees started to decline and in 2004 it filed for bankruptcy. See Table 2.

##### 4.2. The advancement of INVs through growth phases

The firm-level analysis shows that the INVs had developed through four specific phases; each company had distinctive management and foreign business problems that had to be solved before advancing to the following phase. See Table 3. Dominant problem logic has been identified by Kazanjian and Drazin (1989) as a viable method for identifying the growth phases of new ventures. The phases and problems identified in this research were naturally somewhat different as our research focuses on INV growth. The cross-case analysis revealed that the managerial problem in the first or 'INV creation' phase consisted of recognizing the opportunity, developing the first customer-accepted product, securing financing for R&D, developing the market, and obtaining the first revenue from sales (See also Bhase, 1994). The starting point was the entrepreneur's skills, expertise, network contacts, and ability to leverage contingencies, while the actual outcome was not known (see also Sarasvathy, 2001). The business opportunities were based on innovations and were often co-created with customers. Hence, in this phase the international business problem centered on piloting the products in foreign markets and obtaining initial customer feedback and financing. One of the CEOs commented on this early phase as follows: "I think it always takes a long time if you sign the agreement with the OEM, then testing starts and then modifying the product a little bit, ...new features to the application." All four firms had gone through this first phase and overcome these problems. However, some had experienced survival crises with regard to specific problem areas, in particular the delivery of customer-accepted products and financing in the INV-creation phase (Vacon).

The managerial problem confronted when advancing to the second phase, 'commercialization and foreign entries,' was successful commercialization, in other words selling the products in large volumes to reach economies of scale, which also required solving the problem of entering foreign countries. It was found that all the firms relied heavily on leveraging partnerships that provided ready distribution channels and credibility in foreign markets (see also, Hallbäck & Gabrielsson, 2013; Rialp-Criado et al., 2010). Although all four case firms had reached this phase, some of them experienced survival crises. The survival crises were related to a lack of commercialization knowledge, overreliance on MNC channel partners, and leadership problems. One of the founders explained the situation as follows: "In retrospect, I would say agreements were made that should not have been made. But I was an engineer with limited business experience and didn't use a good enough lawyer. This turned out to be a problem later on."

All of the case firms advanced to the third phase, 'rapid growth and foreign expansion.' This phase is characterized by the problem of managing rapid growth in firm size and leveraging economies of scale and scope. It was also necessary to overcome the problems of global expansion and further penetration of potential country markets. In this phase it was important to be able to reduce dependence on network partners

**Table 2**  
Background of the B2B International New Venture case firms.

	Vacon	Biohit	Tectia	Terapixel
Field of business	Frequency converters	Liquid handling and diagnostic test systems	Security Software	Photo mask technology
Vision	Global from inception	Global from inception	Global demand unexpected	Global from inception
Foundation	1993	1988	1995	1990
Start of internationalization				
–Year of first export	1995	1990	1995	1993
–Internationalization degree (3 years)	51% in 1996	90% in year 1991	56% in 1998	50% in 1993
Current foreign status				
–Internationalization degree	80% in 2010	97% in 2010	95% in 2010	10% in 2003/2004
–Globalization degree	33% in 2010	48% in 2010	76% in 2010	10% in 2003/2004
Current size	Large	Close to large	SME	SME/Bankrupt
–Net sales (M Eur)	338	40	9.1	1.0
–Employees	1339	431	70	12
(Year)	(2010)	(2010)	(2010)	(2000/bankrupt 2004)
Growth phase development	Phase 1–4	Phase 1–4	Phase 1–4	Non-survival after 3rd phase

**Table 3**  
The growth phases of the B2B International New Venture case firms.

	1. INV creation	2. Commercialization and foreign entries	3. Rapid growth and foreign expansion	4. Rationalization and foreign maturity
Vacon (sequential growth, survivor)	<ul style="list-style-type: none"> <li>–Founded (1993) by 11 former employees of a large MNC.</li> <li>–Development of frequency converters and their deliveries started to a Finnish sawmill (1995).</li> <li>–A survival crisis occurred when sales did not take off as expected (1995), but a major licensing deal with a US MNC saved the situation</li> </ul>	<ul style="list-style-type: none"> <li>–Commercial breakthrough (1995) by establishment of sales subsidiaries and distribution in major European markets (Germany, Sweden, Poland, Portugal).</li> <li>–MNC channel partners used such as a Finnish MNC KCI Konecranes (1996) and the Swiss giant Schindler (1998).</li> <li>–Foreign sales subsidiaries to seven new European countries (1998–2002)</li> </ul>	<ul style="list-style-type: none"> <li>–Breakthrough to US by major deals with US MNCs such as Cutler Hammer (1998) and others.</li> <li>–Sales subsidiaries and offices established outside Europe (Singapore, China, Russia, United Arab Emirates, India, Australia, Thailand and Brazil, 1999–2007).</li> <li>–A production subsidiary (2004) and R&amp;D unit (2007) established in China.</li> </ul>	<ul style="list-style-type: none"> <li>–Transnational management model introduced (2006–2008).</li> <li>–Geographical integration by forming three sales and service regions (2007): EMEA, Asia-Pacific, and North/South America.</li> <li>–Marketing largely centralized and use of global R&amp;D, IT and manufacturing platforms.</li> <li>–Acquisition and integration of TB Woods and their factories in the US and Italy (2008).</li> <li>–Pipette business approaching maturity.</li> </ul>
Biohit (sequential growth, survivor)	<ul style="list-style-type: none"> <li>–Founded in 1988 by an entrepreneur with financial resources and a holder of hundreds of patents.</li> <li>–Electronic pipette developed and deliveries started (1990) with one of the first customers in the USA.</li> <li>–Export revenues from European countries (Sweden, Denmark, Germany, France), the USA and Japan</li> </ul>	<ul style="list-style-type: none"> <li>–Commercial breakthrough with electronic and mechanical pipettes (1991).</li> <li>–Sales subsidiaries started in several European countries (France, Italy, UK, Austria, and Germany (1991–1995).</li> <li>–Using large OEM private label channels.</li> <li>e.g. 3 M, Johnson &amp; Johnson.</li> <li>–Listed on Helsinki Stock Exchange (1999).</li> </ul>	<ul style="list-style-type: none"> <li>–Becoming leader in electronic pipettes and 4th biggest supplier of liquid handling products.</li> <li>–Establishment of joint venture in Japan (1994) and sales subsidiaries (USA, Russia, China, and India; 1998–2009).</li> <li>–Manufacturing started in China (2005).</li> <li>–Expansion of business with new diagnostics (2001) and consumer products (2009).</li> </ul>	<ul style="list-style-type: none"> <li>–Global maturity reached, but lack of global processes led to financial crisis (2001–2002).</li> <li>–A retrenchment strategy brought firm back to phase 3. ←</li> </ul>
Tectia (retrenchment, survivor)	<ul style="list-style-type: none"> <li>–Founded (end 1995) by a technical university student.</li> <li>–Sales of security software to foreign markets (1996) via a multinational firm situated in home country.</li> </ul>	<ul style="list-style-type: none"> <li>–Commercial breakthrough by selling products in large volumes through an MNC customer and other OEM customers (1997–1998).</li> <li>–Entering US market by establishing sales office (1998).</li> </ul>	<ul style="list-style-type: none"> <li>–Rapid global growth to USA and expansion to Asia (Japan, South Korea, Taiwan) and Europe (Germany, UK) in 2000–2002.</li> <li>–Strong product diversification including hardware products.</li> </ul>	<ul style="list-style-type: none"> <li>–New global expansion, focusing on large enterprises and alignment of global processes (2010).</li> <li>–Never reached this phase.</li> </ul>
Terapixel (non-survivor)	<ul style="list-style-type: none"> <li>–Founded (1990) by a researcher with an existing innovation developed at the Technical Research Centre of Finland.</li> <li>–Export sales of small area photo-masks first to a Swedish and a Brazilian customer (1991) based on former contacts.</li> </ul>	<ul style="list-style-type: none"> <li>–Commercial breakthrough with large area photo-masks via export (1993) to US, Israel, Brazil, and Europe (France, Germany, Sweden, Switzerland).</li> <li>–Survival crisis when office was relocated in 1997 to northern Finland, thereby hindering cooperation with the Technical Research Centre of Finland.</li> <li>–Survival crisis due to maintenance problems with equipment and loss of large customer, thus filed for bankruptcy (2004)</li> </ul>	<ul style="list-style-type: none"> <li>–Expanded rapidly to global markets (Russia, China and Japan) (1995–1996) and diversified product portfolio (1996–2000).</li> <li>–Loss of major customer accounts and difficulties in getting large global deals led to retrenchment to nearby countries (phase 2).</li> <li>←</li> </ul>	

and establish subsidiaries abroad (see also Gabrielsson et al., 2008). The founder of one of the firms commented on the main problem as follows: “We continued working with the US office we had started the previous year. Anyway, we ended up growing 350 percent that year and being comfortably profitable and having established good references and a position in the US. It was a very hectic year.” One of these firms (Terapixel) faced a severe survival crisis and had to narrow its market scope. It eventually lost major customers and had to file for bankruptcy. A former board member commented on the reasons as follows: “The key production tool was out of service for six months so we did not have the cash flow needed [to survive]. Another thing was that the major customers went away.”

The fourth and final phase, ‘rationalization and foreign maturity,’ required overcoming the managerial problem of aligning activities across countries to benefit from synergies and the foreign business problem of achieving a strong global presence in a large number of foreign countries. All except the non-survivor case advanced to this phase (Tectia, Biohit, and Vacon). One of the CEOs commented on the management model in the fourth phase as follows: “Certain

processes are global, but then we also allow local empowerment... We have common ICT tools, the same manufacturing and assembly lines, the same product development model, the same suppliers as much as possible,... common elements like brand, and we also do a lot of centralized marketing. Sales are managed from a regional perspective.” All in all, more formal planning became important in this phase (see also Rialp-Criado et al., 2010; Sarasvathy, 2001). After a survival crisis, one of the firms retrenched to an earlier phase by divesting part of its overly broad product portfolio and was again in the process of entering the fourth phase with a more focused approach (Tectia).

Based on the above cross-case analysis, it may be concluded that INVs advance rapidly through four phases, namely (1) INV creation, (2) commercialization and foreign entries, (3) rapid growth and foreign expansion, and (4) rationalization and foreign maturity. Each is characterized by the management and foreign business problems discussed above. Nevertheless, our study showed that in any phase the firms may confront a survival crisis that forces them to retrench to the previous phase or in the worst case to file for bankruptcy.

#### 4.3. An examination of the factors influencing the growth and survival of INVs and the role of decision-making logic

The following is a cross-case analysis of how the factors influencing growth and survival were encountered by the INVs. The knowledge of opportunities, learning, resources, capabilities and entrepreneurial orientation are analyzed on the firm level while the decision-making logic is analyzed on the level of the entrepreneur (s) and/or main decision-maker(s) (individual or group).

##### 4.3.1. Knowledge of opportunities and learning

Our case analysis showed that knowledge of opportunities is important for initiating INVs, and also for advancement through their growth phases. Many of the entrepreneurs that started the INVs had earlier knowledge of the sector in which they founded their companies (Vacon, Biohit, and Terapixel). This seemed to be important in enabling recognition of new business opportunities. In one case firm, the entrepreneur had studied the field at university, which facilitated recognition of new opportunity (Tectia). It is significant that in all cases the opportunities were identified prior to establishment of the legal entity. The initial opportunities were radical innovations that changed the market landscape. Thus the opportunities were created by the INVs (Vacon, Biohit, Tectia, and Terapixel), instead of discovered on the basis of a prior information search and market analysis. A founder of one of the case companies commented on the growth as follows: “We started with new technology...we were at least two or three years before our competitors, we had no hesitation to go international.” Furthermore, the firms were able to continue identifying new opportunities, which were increasingly discoveries rather than opportunity creation. It was evident that the knowledge of opportunities was an important factor contributing to transition to the next growth phase. However, in one of the case firms (Terapixel) the opportunity identification ceased after new management was introduced by investors. The emphasis varied between opportunity discovery and creation, depending on the decision-making applied at the firms.

Furthermore, our analysis showed that when solving growth problems and managing survival crises, firms acquire knowledge that is important for long-term survival. Many of the case firms gained new knowledge and enhanced their capabilities when they were exploring new business models (Tectia), diversified to new fields (Biohit, Vacon, and Tectia), worked with new channel members (Biohit, Tectia, Terapixel, and Vacon), or successfully managed a survival crisis (Tectia, Vacon). One founder commented on the importance of innovations for long-term survival as follows: “New innovations, new technology, and innovations again and again.” Also, as the case firms used their capabilities and processes in their daily operations in product development, manufacturing and marketing, they acquired advantages that could be seen as economies of scale and learning and other global synergies important for staying competitive and surviving. One CEO commented on the importance of transferring learning to new sites as follows: “When we established the second factory we decided that we would have the same products and equipment that we had in our main factory...the same way of operating the factory.” In managing the survival crisis, it was important for firms to be able to exploit their existing capabilities and to make their operations more efficient: “We have made some growth investments, but we have postponed several. We have not been adding new people; we have been trying to save money, we have been trying to look at our internal operation, whether we can be more effective, and so on.” Furthermore, the constant improvements in management practices were important during the various growth phases, including management rotation and retrenchment ability.

However, an important observation was made concerning the case firm that did not survive (Terapixel). In the latter phases it decided to focus on a limited customer base; this meant that it was receiving feedback from fewer business partners. Also, abandonment of its close relationship with the Technical Research Centre of Finland further limited

learning. The firm seemed to focus only on short-term survival and was not able to expand to new international markets, which would have been necessary to secure long-term survival according to the founder: “We had a very stable customer base, we had a very good product, but then we should have been going international more actively.” Moreover, it was not able to exploit its product development and production to gain synergy advantages: “The firm continued to exist as a special solutions company doing a lot of customer-specific tailoring of its products, and not benefiting from economies of scale.” Finally, the loss of a major customer and a major break for maintenance of production equipment left the firm with no other option than to apply for bankruptcy. It was also evident that the change in the firm's approach to operations and markets was based on the decision-making of the new management, which will be discussed more when we examine the effect of decision-making logic.

##### 4.3.2. Resources and capabilities

Based on our analysis, the amount of resources and capabilities affected firm growth. All the case firms (Biohit, Vacon, Tectia) that advanced to the later phases have been in a better position with respect to both financial resources and managerial experience than the one firm (Terapixel) that did not progress as far. The more advanced firms had experienced CEOs and management team members who were capable of planning and organizing international growth. The board of the case company that had struggled to achieve growth lacked the capabilities needed for industry knowledge, planning, and decision-making. The existence of resources and skills has contributed to growth and also been crucial to survival, as the founder of one of the firms commented: “When I started the firm, my position was much better than that of many other entrepreneurs. I had a lot of experience and I had a lot of money as well.” All the firms cited financial resources as particularly crucial to survival. When they did not meet their growth objectives, they soon had even fewer opportunities to obtain financing due to a bad track record. It was also noted, however, that excessive resources may be harmful. They can lead to uncontrolled growth and an increased risk of non-survival as the founder of one firm witnessed: “I think there is a good chance that the company would have ended up doing better without it [financing via initial public offering]. And we would have been much more careful in various spending-related issues. We would probably have been profitable and would have focused much more on the core businesses which we're good at.”

Technological capabilities and innovations were important to all of the case firms. The case firms had a number of patents, some even large patent portfolios. However, that alone is not sufficient to secure growth and survival. In addition to technical capabilities, marketing- and management-related capabilities were also emphasized. Technical capabilities helped to overcome the challenge of developing competitive product(s) in the INV creation phase. To transfer to the successive phase, marketing capabilities were especially important in overcoming the challenges related to commercialization and foreign market entry. Moreover, marketing capabilities were also required to accelerate growth and expand into other foreign markets in the subsequent phase. Although management capabilities were especially important to facilitate transfer between phases, interviewees also emphasized their role in the latter two phases when facing the problems of managing rapid growth and foreign expansion and also when aligning operations globally. Moreover, management capabilities were needed when facing survival crises. Dynamic capabilities are particularly important for advancing through the phases and overcoming eventual survival crises. Hence, being able to reconfigure and integrate existing resources to meet these new requirements and to develop their capabilities constantly in a dynamic way proved to be of the utmost importance. The CEO of one firm commented as follows: “It's shifting. If I look back, in the very beginning when the company was established, R&D was the key. Then after that it was production, and then sales, and after that R&D again.”

**Table 4**  
Factors influencing the growth and survival of the B2B International New Venture case firms.

	Knowledge of opportunities and learning	Resources and substantive capabilities	Networking and dynamic capabilities	Entrepreneurial orientation	Decision-making logic
Vacon (sequential growth, survivor)	<ul style="list-style-type: none"> <li>–An opportunity for developing and manufacturing frequency converters with software enabling easy customization to different global market segments is created by experienced former MNC employees.</li> <li>–Explorative learning from product diversifications and MNC channel partners.</li> <li>–Exploitative learning by developing efficient manufacturing, its own brand and transnational management.</li> <li>–Use of effectuation logic seemed to decrease the requirements for its own resources and enhance the role of opportunity creation and exploration, networking, and entrepreneurial orientation for growth and survival in frequency converter business.</li> <li>–In later phases increased use of causation logic led to more formal processes for information search and transnational management, exploitation of existing manufacturing capacity and brand, and decreased role of entrepreneurial proclivity for growth and survival.</li> </ul>	<ul style="list-style-type: none"> <li>–Strong previous technological and international marketing experience in the field by founders.</li> <li>–Common product platforms and effective management of product planning and R&amp;D projects.</li> <li>–Software and mass customization skills in frequency converters.</li> <li>–Sales, customer relationship and sourcing capabilities.</li> </ul>	<ul style="list-style-type: none"> <li>–Establishment of subsidiaries, distribution and sourcing of components by using previous networks and contacts.</li> <li>–Ability to reconfigure the capabilities to fit the needs of the phase.</li> </ul>	<ul style="list-style-type: none"> <li>–High innovativeness and risk-taking in early days inducing growth, somewhat more rigid later on.</li> <li>–Strong empowerment of employees with little bureaucracy in beginning, more hierarchy needed when the firm had grown.</li> <li>–Ability to change direction fast supports survival.</li> </ul>	<ul style="list-style-type: none"> <li>–Strong use of partnerships in sales and supply instead of relying solely on its own resources.</li> <li>–Rapidly addressed new opportunities in a growing industry.</li> <li>–The expected returns not known in early phase.</li> <li>–Moderation influence of decision-making logic described below →</li> </ul>
Biohit (sequential growth, survivor)	<ul style="list-style-type: none"> <li>–Opportunity of digital pipettes and diagnostic systems are created by a doctor with experience from a previous firm in the field.</li> <li>–Explorative learning through product innovations developed in cooperation with leading researchers and experimenting in gaining market acceptance.</li> <li>–Exploitative learning by developing constantly product improvements and marketing through opinion leaders.</li> <li>–Effectuation logic meant that the importance of innovations, market creation, and learning through partnering with large customers seemed to increase in achieving growth and surviving in biotechnology business.</li> <li>–Causation logic applied in the mature business meant increased bureaucracy and the need for organizational processes to exploit product and marketing synergies to safeguard growth and ensure survival.</li> </ul>	<ul style="list-style-type: none"> <li>–Existing financial resources of the founder in beginning and listing of the firm.</li> <li>–Strong innovation, R&amp;D capability and patenting policy as well as founder's experience from earlier business.</li> <li>–Marketing capability and budget limit growth in diagnostic business.</li> <li>–OEM private label firms leveraged to access markets rapidly.</li> <li>–Limited government support</li> </ul>	<ul style="list-style-type: none"> <li>–Using a network of contacts from an earlier firm to establish rapidly subsidiaries and find suitable distributors in foreign markets.</li> <li>–Ability to reconfigure capabilities from existing business to new diagnostics business.</li> </ul>	<ul style="list-style-type: none"> <li>–Innovative entrepreneur and employees.</li> <li>–Firm encourages risk taking.</li> <li>–The bureaucracy has increased along with growth in firm size, including more formalized processes.</li> <li>–Ability to adapt rapidly to changing conditions has decreased with growth.</li> <li>–Entrepreneur needs to give more responsibility to employees as firm grows.</li> </ul>	<ul style="list-style-type: none"> <li>–Partnerships with large customers and distributors.</li> <li>–Creating the market for the diagnostics products in cooperation with doctors.</li> <li>–Risk affordable due to use funds from sold firm.</li> <li>–Moderation influence of decision-making logic described below →</li> </ul>

Tectia (retrenchment, survivor)	<ul style="list-style-type: none"> <li>-An opportunity for Internet-based communication protection software is created by a student addressing a security problem of the university.</li> <li>-Explorative learning from new Internet business model and MNC channel crisis management.</li> <li>-Exploitative learning by using technology capabilities to expand to new business areas, development of marketing skills, agility by management rotation and retrenchment ability.</li> </ul>	<ul style="list-style-type: none"> <li>-Financial resources of the founder beneficial, but later an IPO provided abundance of cash leading to uncontrolled growth and financial difficulties.</li> <li>-The technological capabilities have been stronger than marketing.</li> <li>-Lack of managerial knowledge which was strengthened in later phases by bringing in new CEOs.</li> <li>-Founder worked as both engineer and CEO as needed.</li> <li>-Limited government support in the early phases.</li> </ul>	<ul style="list-style-type: none"> <li>-Firm networked with technical standardization bodies to achieve awareness.</li> <li>-Ability to reconfigure capabilities during growth and retrenchment.</li> </ul>	<ul style="list-style-type: none"> <li>-The role of the innovative founder has been central.</li> <li>-High innovativeness and risk-taking in early phases and alert to emerging opportunities.</li> <li>-The entrepreneurial orientation has varied; was first strong, weaker during retrenchment, then increasingly stronger again.</li> </ul>	<ul style="list-style-type: none"> <li>-Created a totally new market by exploiting security concerns in Internet</li> <li>-Fast entry to market with new business model without any analysis; in later stages more systematic market analysis.</li> <li>-Participated in technical standardization alliances to create a suitable market for its own products.</li> <li>-Moderation influence of decision making logic described below →</li> </ul>
Terapixel (non-survivor)	<ul style="list-style-type: none"> <li>-Causation logic that was applied increasingly in later phases decreased the importance of risk-takings, but increased the utilization of existing capabilities and management rotation for growth and survival.</li> <li>-An opportunity of photo mask manufacturing created with a foreign partner at the Technical Research Centre of Finland, which was commercialized by the entrepreneurs. Later creation of new opportunities was discouraged by management.</li> <li>-Explorative learning through co-operation with multiple customers resulting in product innovations, which, however, ceased towards the later phases.</li> <li>-Abandoning closeness to the Technical Research Centre limited benefits from learning and restricted customer base; leads to non-survival.</li> <li>-The effectuation logic meant that the need for the firm's own financial resources was minimal when the resources of research centre were leveraged while the role of innovativeness was central for growth and survival.</li> <li>-Causation logic in later phase decreased opportunity for renewal and increased the need for its own resources, which eventually led to non-survival.</li> </ul>	<ul style="list-style-type: none"> <li>-Resources such as the laser equipment and clean room facilities crucial, breakdown of key equipment caused non-survival.</li> <li>-The founder and the personnel was very experienced as to creation of photo-masks, but had less marketing and international business experience.</li> <li>-Government support was very important, but financing insufficient.</li> </ul>	<ul style="list-style-type: none"> <li>-The networks enabled by the Technical Research Centre of Finland were important in the early phase, but relocation of the office ended them.</li> <li>-Firm was able to reconfigure capabilities to address new developing markets rapidly.</li> </ul>	<ul style="list-style-type: none"> <li>-Innovativeness, risk-taking and proactiveness were beneficial in the early phases of growth.</li> <li>-A new venture capital investor pushed the entrepreneurial orientation towards more rigidity in pursuing global expansion.</li> <li>-The relocation of production and the repair of critical technology took a lot of management attention.</li> </ul>	<ul style="list-style-type: none"> <li>-Created the market by using partnerships with customers and major government R&amp;D centre.</li> <li>-No expected return calculation in the beginning</li> <li>-Affordable risk in beginning due to use of government facilities.</li> <li>-Little planning or market research in early phase, later increased planning.</li> <li>-Moderation influence of decision making logic described below →</li> </ul>

Networking capabilities also seem to be important for growth. Two firms (Vacon, Biohit) had used an extensive network established prior to foundation of the current firm to set up subsidiaries and make long-term agreements with distributors and OEM channels. The CEO of one of the firms had the following to say: “It was based on my network. I think that we started very early in France because I knew and still know the current subsidiary manager very well.” Furthermore, when seeking global expansion it was found important to have a network that was wide enough to prevent overdependence on a single partner. This may restrict development of one’s own global operations and advancement to the latter phases (Tectia). Networking was also important for survival. Many of the case firms had used their network contacts when they confronted survival crises (e.g. Vacon). To summarize, the existence of sufficient but not excess resources and of substantial dynamic and networking capabilities seems to assist INVs in overcoming problems associated with managing growth and foreign expansion. See [Table 4](#) for information on factors influencing the growth and survival of INVs.

#### 4.3.3. Entrepreneurial orientation

The analysis revealed that without an entrepreneurial orientation and low rigidity, the entrepreneurs could not have succeeded in starting the firms. We looked at entrepreneurial orientation in terms of the innovativeness, risk-taking, and proactiveness of the case firms ([Lumpkin & Dess, 1996](#)). The analysis showed that in all cases the innovativeness of the entrepreneur and employees is important for development of a competitive product offering particularly in the INV creation phase, but also to a certain extent in later phases. The CEO of one firm put it this way: “We were very innovative; innovations, aggressive innovation, and patenting strategy created the whole thing. Otherwise we would not be around. For example in 1991 we had 16 patents and other listed Finnish firms had a total of only 11.” To move on to the subsequent phase, proactiveness was required for solving challenges related to commercialization and entering foreign markets. Moreover, to be able to achieve rapid growth and expand further in foreign markets the firms need to be proactive, ready to consider new approaches, and prepared to take risks. Decisions to invest in new foreign sales and production subsidiaries are especially risky. Solving the problem of global alignment in the last phase seems to require proactiveness, while the importance of other elements of the entrepreneurial orientation is less important. However, while an entrepreneurial orientation is important in the INV creation phase, it may actually hamper growth in later phases. As the firm grows, the importance of rigidity and more formal management seem to increase. An overly agile and innovative approach may distract the firm from marketing its existing product ranges. Global expansion also required rigidity in implementing the agreed plans without making too many changes. It was apparent that by the time they had reached the third and fourth phase the firms had reduced risk-taking, developed a more formalized innovation process, and expanded their bureaucracy.

Many firms commented that an excessively entrepreneurial orientation threatened survival (e.g. Vacon). This was also supported by evidence from the case firms that had gone bankrupt or were experiencing severe survival crises (e.g. Tectia, Terapixel) since they had been overly innovative and inclined to excessive risk-taking. As a result of this orientation, they had attempted to seize all possible opportunities instead of making full use of the existing product range. A board member of one firm that did not survive commented as follows: “Somehow, the original idea faded away and new ideas popped up here and there. And chasing after this application and chasing after that application, getting a little bit of money here and there.” Based on the above examination we found that an initially high but diminishing level of entrepreneurial orientation contributed to advancement of an INV through the growth phases, while a high level of entrepreneurial orientation apparently endangered survival. Altogether, we noted that a change in the

decision-making of INVs took place when they entered the latter phases of development, which we will now explore in more detail.

#### 4.3.4. Decision-making logic

Decisions were mainly made by the founding entrepreneur(s) in the early phases. However, in some cases (e.g. Vacon) decision-making had been increasingly transferred in later phases to a CEO or president. Analysis of the decision-making logic showed that many of the entrepreneurs had used effectuation logic ([Sarvasvathy, 2001](#)) in their decision-making in the early phase of development and later reverted to a causation type of logic when solving the problems associated with growth and overcoming crises. This was apparent in how the firms interacted with their environment and used their resources and in their entrepreneurial behavior. In the analysis of the data we focused especially on whether the key characteristics mentioned by [Sarvasvathy \(2001\)](#) were apparent: (a) affordable loss rather than expected return, (b) exploitation of contingencies rather than existing knowledge, (c) controlling an unpredictable future rather than predicting an uncertain one, and (d) strategic alliances rather than competitive analysis. These characteristics have been operationalized by [Chandler et al. \(2011, p.379\)](#), and were useful in our analysis. The entrepreneurs did not have clear goals in the beginning and in starting businesses they took affordable risks that were based more on intuition than on return-on-investment calculations (see also [Read, Song, & Smit, 2009](#)). The founder commented as follows: “I was just going there open-minded, if you want to make a profit, we have to be there. I had never calculated what the return time is.” As the case firms were all creating entirely new markets, market analysis did not play a role. Instead, the entrepreneurs seized arising opportunities and exploited contingencies in the environment. The founder of one successful firm commented as follows: “We’ve had a tradition of creating new markets...I think as a small technology company you are accessing a niche that others aren’t really playing in or that you have something unique that makes people buy your product.” In the process of creating new markets, all of the case firms used partnerships and strategic alliances in which the risks and the benefits of success were shared (see [Read, Song, et al., 2009](#)). The partnerships proved to be important in establishing sales in new countries, in R&D, and in production arrangements as can be seen from the comment of one founder: “The first customer we got through a research institute and through my own connections and contacts.” It was also apparent that in many aspects the role of effectuation logic in decision-making declined as the firms advanced towards the latter stages. Causation logic became more evident as witnessed by one of the founders: “Now it’s been a systematic process in the last year or two years, where we’ve used market analysis firms, both as a marketing vehicle and as an analysis vehicle, helping us position the products and understand the customers, and used the IDC for instance.”

A closer analysis of the relationships between the antecedent factors and growth and survival revealed that the decision-making logic seemed to moderate the effect of opportunity identification, learning, resources, and capabilities on the growth and/or survival of INVs. Closer examination of the opportunity discovery and creation process showed that effectuation-based decision-making logic increased the importance of opportunity creation for growth while causation logic led to the increasing importance of opportunity discovery. The effectuation logic led the entrepreneurs to create innovative business opportunities that were new to the market, as one of the founders commented: “When we started, it was at an early stage of the market. We were one of the pioneers...by the end of the year, I was getting 150 emails per day from people wanting support, Berkeley University wanted to buy commercial support from me. I also started getting inquiries from people who wanted to start selling it. And so I decided to start the company.” With regards to causation logic, it seems to enforce the discovery of more incremental product and marketing program improvements. Furthermore, when turning to examine the relationship between learning and survival it was found that effectuation logic reinforces

the advantages of explorative learning for survival, while causation logic emphasizes the importance of exploitative learning. The former CEO commented on the importance of learning for survival as follows: “After that [change of decision making] they became more careful, they wanted to have numbers...If we are going to China, how much will we have to spend, what is the return time?...They were happy to have a stable product, a stable customer base and stable profit, but they did not realize that in this business you either go there [to learn from global markets] or the firm goes down.”

Effectuation-based decision-making logic also meant that the necessary additional resources were acquired from network partners instead of internally or in the form of bank loans. Thus the role of the firm’s own financial resources and substantive capabilities was less important for growth and survival due to use of effectuation logic. For example, one CEO commented that they were able to obtain financing from a network partner in their survival crisis: “A US firm wanted to license this software block. And with the license fee, our firm was able to survive in 1995, because the bank was unwilling to finance the company.” However, when analyzing the impact of effectuation logic (e.g. return calculations were not made) on the role of the entrepreneurial orientation in securing growth and survival, the effect was quite the opposite. The use of effectuation logic seemed to make the entrepreneurial orientation—including risk-taking—even more important for growth and survival than causation logic. Extensive use of effectuation logic—that is not calculating potential returns—called for enhanced risk-taking as one CEO remarked: “At least in the beginning phase, we had rather big risks. When you are setting up new companies, of course we knew that it takes money, but whether it will start to produce money in two or three years, nobody knows.” Similarly, the drive to control an unpredictable future increased risk-taking behavior: “To a certain extent I’m a risk-taking person because I’ve always been in an environment that has never been ready for me so I’ve always built my own environment.” Moreover, effectuation logic increased the importance of being proactive and innovative when identifying contingencies that could bring new opportunities for the firm. One managing director expressed the importance of proactiveness when applying effectuation logic as follows: “I was just going there open-minded. I know that the market is there and if you want to make a profit, we have to be there.” Effectuation logic also seemed to increase the importance of the dynamic and networking capabilities of these firms for securing firm growth and survival, as one of

the founders put it: “It wasn’t a clever pre-planned strategy. It was based on my own network.” We can conclude from this discussion that there is tentative qualitative evidence for assuming that decision-making logic seems to either decrease or increase the importance of opportunity creation, explorative learning, resources, capabilities, and of the entrepreneurial orientation for securing growth and/or survival.

4.4. Dynamic model and proposition development

4.4.1. Dynamic model of growth and survival of INVs

A dynamic model for the growth and survival of INVs in the high-technology business-to-business field based on the cross-case analysis and contributing factors is shown in Fig. 1. The model enhances our understanding of the international behavior of INVs over time (Jones & Coviello, 2005), in particular decision-making and the dynamic states through which it develops (Levie & Lichtenstein, 2010). In building our model we drew from the earlier internationalization process models (Johanson & Vahlne, 1977, 2009) and effectuation theory (Sarasvathy, 2001). Change and state aspects are apparent in the development of INVs. In our model the ‘state’ consists of the configuration of the INV growth phase and the survival status with a set of opportunities, resources, and the entrepreneurial orientation. ‘Change’ consists of growth advancement or retrenchment decisions, solving management and foreign growth problem and survival crises as well as learning from these activities.

The dynamism of the model relates to the interaction with regards to state and change constructs in growth and survival of INVs. On the one hand, the state variables, in particular knowledge of opportunities, resources, capabilities, and the entrepreneurial orientation are expected to affect change variables such as decisions on growth advancement (or retrenchment) and efforts to overcome growth problems and the survival crises related to growth activities. There is reason to expect that knowledge of opportunities can be an important driver of global growth (Johanson & Vahlne, 2009). Especially important is the entrepreneur’s access to information and to the cognitive capabilities needed to recognize opportunities (Shane, 2003 p.45) through either discovery or active creation (Alvarez & Barney, 2007). On the other hand, the change variables, including solutions to growth problems, overcoming survival crises, and learning will affect the state variables by enabling the firm to survive and move to a new growth position. Learning is the major

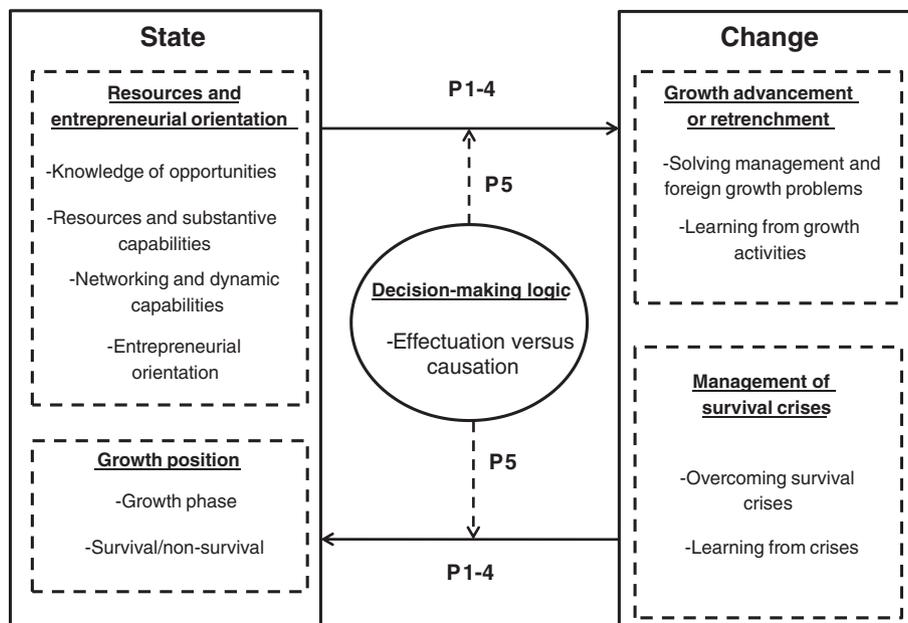


Fig. 1. A dynamic model for the growth and survival of INVs and the effect of decision-making logic in the high technology, business-to-business field.

means for overcoming rigidity, searching for new alternatives, and solving the growth problems that must be addressed to advance to a new growth position and to survive (Cyert & March, 1963). Learning can be of an exploitative nature, i.e. learning economies and other efficiency benefits resulting from utilization of existing resources, or explorative, i.e. acquiring new knowledge through experimentation and innovation. For growth and survival it is important that the right balance is found between the two learning mechanisms (Levinthal & March, 1993). Moreover, in our research the decision-making logic—the balance between the use of effectuation logic and causation logic—was found to moderate the effect of the state and change factors (Sarasvathy, 2001).

Moreover, our empirical analysis revealed four critical phases in INV growth. Based on the dominant problem logic (Kazanjian & Drazin, 1989), we identified the problems related to both management and foreign business that were distinctive to each phase. However, it became evident that although many of the case firms evolved through specific phases, retrenchment also occurred. Survival crises could occur in any phase and if not addressed properly, they posed the risk of non-survival for the firms. Progress through the phases was very rapid. This finding is in line with recent conceptualization in entrepreneurship literature that has highlighted a need for a more dynamic approach to understanding firm growth (Levie & Lichtenstein, 2010). We recognize that the number of phases may vary in different contexts and there may be smaller and more radical changes in development. However, the managerial and foreign growth problems that emerged in our case study in the high-technology business-to-business INVs originating in SMOPECs were fairly constant across all cases and we were therefore able to categorize them in distinct phases.

#### 4.4.2. Proposition development

Factors affecting the growth and survival of INVs and the mechanism transferring the firm to the next state are now examined more closely. We will also develop propositions that explain the growth and survival of INVs. Our analysis showed that advancement to the next growth state requires that the entrepreneurs of the firms have knowledge of opportunities, but also that they are able to solve the growth problems identified in each phase. Many of the entrepreneurs had been active earlier in global firms; this helped them to identify new growth opportunities. Earlier research has found that entrepreneurs may be alert to discover opportunities that exist already or are waiting to be identified (Kirzner, 1973, p.74). They may also have the entrepreneurial expertise needed to create new opportunities (Read, Dew, et al., 2009). Better access to information and superior cognitive capabilities help entrepreneurs to identify growth opportunities (Shane, 2003, p. 51). The opportunities could emerge as the result of creation or discovery (see also Alvarez & Barney, 2007). In the early phases of development INVs could be seen to create opportunities rather than discover them. Some of the INV firms developed new products and technologies that had not previously had a market or introduced totally new innovations that did not have direct competitors. However, towards the latter phases opportunities were discovered more as part of a formal market research and planning process. They were often less radical in nature, being mostly improvements to existing products or related diversification into areas where existing capabilities were useful. However, whatever the type of opportunity, knowledge of this opportunity was needed for the transition to the next phase. In addition the specific growth problems of each phase had to be solved. So we can conclude that knowledge of opportunities and solving growth problems are important factors affecting transition to the next growth phase.

The case analysis revealed that in addition to solving major survival crises at hand, explorative learning in the form of experimenting and trying new growth avenues was especially important for long-term survival. Solving growth-related problems and managing survival crises also generated knowledge and information useful for further growth and especially for long-term survival. This is in line with findings according to which firms that do not secure learning

risk failure (Levinthal & March, 1993). Although it is important for survival to gain learning advantages by exploiting existing resources and capabilities, firms should also develop the new resources and capabilities needed for the next growth phase and to survive long-term. We therefore assert that knowledge of opportunities and solving growth problems enable advancement through the growth phases, while survival also requires management of acute survival crises and accumulation of knowledge through learning. Hence, this examination leads to the following propositions:

**Proposition 1a.** *Advancement through growth phases requires knowledge of opportunities and solving growth problems in B2B high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 1b.** *Survival requires overcoming potential survival crises and accumulation of knowledge through learning in high-technology, business-to-business INVs originating in SMOPECs.*

The results of our research show that it is important for INVs to raise funds or other endowments from investors, founders (c.f. Hannan, 1998), or government (c.f. Mudambi & Zahra, 2007). It was evident that sufficient resources and the existence of the necessary experience and capability will induce growth and survival. For INVs originating in SMOPECs, securing adequate resources and capabilities is especially challenging as the resource pool is more limited than in larger economies. Managerial resources such as an experienced CEO, a complementary management team, and a visionary board capable of fast decision-making were found to be critical resources for international growth (see also Penrose, 1959). Previous experience and cognitive skills increase the ability of entrepreneurs to see a solution when problems arise (Shane, 2003, p. 51). Moreover, resources need to be complemented with substantive capabilities. The interviews showed that especially technological, marketing, and management capabilities are of high importance for both growth and survival. To move on to subsequent phases, these capabilities were needed for solving growth problems and managing survival crises. Technological capabilities were especially important in the first phase, while advancement to the following phase required strong marketing capabilities. Management capabilities were needed to manage transitions between the phases and to overcome crises. This supports those researchers who argue that sufficient resources and substantive capabilities are necessary for growth and survival (Hannan, 1998; Knight & Cavusgil, 2004; Laanti et al., 2007; Lisboa et al., 2011). Hence the following propositions were made:

**Proposition 2a.** *Advancement through growth phases is positively related to the existence of resources and substantive capabilities in high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 2b.** *Survival is positively related to the existence of resources and substantive capabilities in high-technology, business-to-business INVs originating in SMOPECs.*

Moreover, it was crucial to be able to reconfigure and integrate the resources according to the needs of a particular phase. Each phase was found to include distinctive growth-related management and foreign business problems that required solutions. Our research findings are in line with the literature emphasizing the critical role of dynamic capabilities in overcoming such challenges (Teece, Pisano, & Shuen, 1997; Zahra et al., 2006). We also found networking capabilities (Mort & Weerawardena, 2006) to be important for overcoming such growth and survival problems. Networks increase the growth rate of INVs by helping them to identify international opportunities and establish the credibility that often leads to strategic alliances and other co-operative strategies (Oviatt & McDougall, 2005; Zhou et al., 2010). Moreover, INVs can globalize their activities without making large investments and facing unnecessary risk by using their activity links, resource ties, and actor bonds (see also Håkansson & Snehota, 1995, p. 26), which is especially important for resource-scarce INVs from SMOPEC countries.

Earlier studies in the SMOPEC context have shown that networking is especially important for global growth of INVs (Laanti et al., 2007). INVs suffer from the liabilities of newness, size, and foreignness and the limited domestic resources pool in SMOPEC countries makes it even more important to rely on the resources of network actors, which may provide a number of network benefits, including enhanced competitiveness and survivability (Sepulveda & Gabrielsson, 2013). Hence, the capability of firms to network and to exploit and enhance their own resources is crucial (Cook & Emerson, 1978; Ford et al., 1998, p. 46; Gabrielsson & Kirpalani, 2004). On the basis of the above discussion, the following proposition can therefore be made:

**Proposition 3a.** *Advancement through growth phases is positively related to the existence of dynamic and networking capabilities in high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 3b.** *Survival is positively related to the existence of dynamic and networking capabilities in high-technology, business-to-business INVs originating in SMOPECs.*

We also found that the high entrepreneurial orientation of INVs prevailing in the early phases eventually diminishes. Moreover, an excessively entrepreneurial orientation may endanger the survival of an INV in any phase. This is in contrast to Knight and Cavusgil (2004), who found in their study that the superior international business performance of INVs was driven positively by an entrepreneurial orientation that induces high-quality products. The case study evidence showed that overcoming the problems related to management and foreign business called for innovativeness, proactiveness, and risk-taking (Lumpkin & Dess, 1996). Innovativeness was found especially important for overcoming the challenges related to product development and proactiveness for commercialization and entering foreign markets. Risk-taking was needed for the investment necessary to overcome the above-mentioned problems, but also during rapid growth and foreign expansion for the investment in sales and production subsidiaries. However, if firms are to survive they should not be overly innovative or take excessive risks, especially in the later phases. A certain cautiousness and rigidity (Luostarinen, 1979) are required to survive beyond the INV creation phase and embark on subsequent phases. In business-to-business markets individual sales transactions are often large, thereby increasing the risks involved. Earlier research has generally supported a positive relationship with entrepreneurial orientation and performance (Lumpkin & Dess, 1996), while some recent research has found evidence that risk-taking may have a negative effect on firm performance (Hughes & Morgan, 2007). More recent findings on new ventures further show that very high levels of entrepreneurial orientation can have a negative effect on performance as the relationship may be curvilinear (Inverse U-shaped). A strong entrepreneurial orientation may lead to overly aggressive product development, excessive resource requirements for commercialization and foreign market entry, and uncontrolled risk-taking in investment during rapid growth. (Su, Xie, & Li, 2011) Hence, although INVs need to take certain risks and to be innovative and proactive to overcome growth problems in the early phases, there is an inevitable risk of failure. We can therefore assert that a strong entrepreneurial orientation has a positive effect on advancement along growth phases, but increases the risk of non-survival. Based on the above discussion, the following proposition was formulated:

**Proposition 4a.** *Advancement through growth phases is positively related to an entrepreneurial orientation in high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 4b.** *Survival is negatively related to an entrepreneurial orientation in high-technology, business-to-business INVs originating in SMOPECs.*

Based on the analysis of high-technology, business-to-business INVs originating in SMOPECs, it is apparent that the choice of

decision-making logic—effectuation or causation (Read, Dew, et al., 2009; Sarasvathy, 2001)—affects growth and survival. This stems from a fundamental difference in how management and foreign business problems are solved. Causation assumes a predictable industry environment that can be controlled through effective planning of growth strategies, while effectuation assumes that the industry environment need not be predicted since it can be influenced through the creation of new markets by the firm. Analysis of the earlier growth phases of the case firms showed that effectuation logic had been used. The growth plans were not based on return calculations and the firms had used strong partnerships and networks to grow. Moreover, they had exploited emerging contingencies and in many cases created new markets that did not previously exist. Similarly, analysis of the later growth phases indicated that causation logic was used more than effectuation. The firms had planning processes in place where targets were set and they emphasized financial control systems and the role of return calculations as a natural part of any investment. However, a more detailed examination revealed that the decision-making logic affected the relationship between the antecedent factors and growth and survival and hence there was evidence of a moderation effect.

Examination of the influence of opportunities on growth and survival showed that the decision-making logic increased the importance of either opportunity creation or opportunity discovery for growth and survival in the case INVs. When the case firms applied a more effectuation-based logic, opportunity creation was important for growth, while the use of causation logic increased the importance of opportunity discovery for growth. This is in line with earlier research that has found that when effectuation logic prevails the growth opportunities are mainly created endogenously by the actions, reactions, and enactment of entrepreneurs and the decision-making context is uncertain (Alvarez & Barney, 2007). Moreover, the cross-case examination revealed that experimental learning was an important factor for survival when effectuation logic was used, while the advantages of exploitative learning were important to the case firms for survival when causation-based decision-making logic was applied. It has been argued earlier that to survive, firms need to balance these two learning advantages (Levinthal & March, 1993). Our finding—that the decision-making logic is an important factor in determining the importance for survival of each type of learning—is therefore interesting. We may therefore assert the following concerning the moderation effect of decision-making logic on the relationship between opportunities and growth and on the learning and survival of INVs:

**Proposition 5a.** *The extent of effectuation logic will positively moderate the influence of opportunity creation (vs. discovery) on the growth of high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 5b.** *The extent of effectuation logic will positively moderate the influence of explorative (vs. exploitative) learning on the survival of high-technology, business-to-business INVs originating in SMOPECs.*

The use of effectuation logic also meant that resources and capabilities were not as important for growth and survival in our cases as one could have assumed. This can be understood from the nature of this logic, as effectuation builds on exploiting contingencies in the environment by leveraging network resources and to a lesser degree by emphasizing the firm's own resources for growth (Sarasvathy, 2001). We also observed that excessive resources were not always beneficial for INVs (Bradley, Wiklund, & Shepherd, 2011). Slack resources led to uncontrolled growth when firms applied effectuation logic. Effectuation does not emphasize long-term planning and the entrepreneur can use the slack resources for high-risk trials that may endanger the survival of the INV. Although the effects of slack resources have been discussed in earlier research, there has been little investigation of the international new venture context (Sapienza et al., 2006). Similarly, analysis of the times when the

firms applied logic that was more of the causation type revealed the high importance of resources and capabilities for growth and survival. The firms planned the needed resources and investments through more advanced financial planning and reporting systems. Public offerings were organized to raise the needed capital and new technical, marketing, and management capabilities were developed to meet the growth targets. Thus causation logic seems to force exploitation of the firm's own resources and capabilities during growth and in securing its survival. This leads us to assert the following:

**Proposition 5c.** *The extent of effectuation logic will negatively moderate the effect of resources and capabilities on the growth of high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 5d.** *The extent of effectuation logic will negatively moderate the effect of resources and capabilities on the survival of high-technology, business-to-business INVs originating in SMOPECs.*

The decision-making logic seemed to be important for realizing the benefits of dynamic capabilities. Our analysis showed that when INVs relied on the causation type of logic in decision-making they exploited existing knowledge consisting of routines, assets, and strategies developed to cope with existing technologies and the environment. However, dynamic capabilities mean that firms do not only adapt to business ecosystems, but also shape them through innovation and collaboration with other enterprises and institutions (Teece, 2007). This requires a logic that is more of the effectuation type decision-making that effectively uses contingencies in the environment when they arise (Sarvasathy, 2001). Furthermore, collaboration with customers and other firms and entities is easier if the firm has competencies that facilitate networking. Effectuation logic seems to enhance the positive impact of network capabilities on growth and survival as it requires such collaboration. We can conclude that the existence of dynamic and networking capabilities is not enough; firms need to make these capabilities an integral part of their decision-making logic in solving both managerial and foreign business problems and in overcoming survival crises. We postulate as follows:

**Proposition 5e.** *The extent of effectuation logic will positively moderate the effect of dynamic and network capabilities on the growth of high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 5f.** *The extent of effectuation logic will positively moderate the effect of dynamic and network capabilities on the survival of high-technology, business-to-business INVs originating in SMOPECs.*

Research has found that the entrepreneurial orientation–performance relationship in new ventures may be context-specific (Su et al., 2011). This was also evident from our empirical examination, which showed that decision-making logic is an important intervening factor influencing this relationship. Causation emphasizes the goals of the firm as the starting point for the decision-making process while effectuation recognizes the entrepreneur as the central actor whose characteristics are important for the growth and survival of the firm. Moreover, while causation is based on expected returns from investment calculations, effectuation requires that entrepreneurs take the maximum affordable risk (Sarvasathy, 2001). Examination of the cases showed us that effectuation seems to moderate the relationship between entrepreneurial orientation and growth and survival. Effectuation logic makes full use of the characteristics of the entrepreneur and enables the firm to discover and utilize all growth opportunities. This result is in line with earlier research which found that an entrepreneurial orientation is more positively related to sales growth in firms whose strategies are emergent rather than planned (Covin, Green, & Slevin, 2006). In contrast, a negative relationship between entrepreneurial orientation and survival was effectively mitigated by the existence of effectuation as

entrepreneurs used more of the resources of other partners and took only affordable risks. This leads us to postulate the following:

**Proposition 5g.** *The extent of effectuation logic will positively moderate the effect of entrepreneurial orientation on the growth of high-technology, business-to-business INVs originating in SMOPECs.*

**Proposition 5h.** *The extent of effectuation logic will mitigate (negatively moderate) the negative effect of entrepreneurial orientation on the survival of high-technology, business-to-business INVs originating in SMOPECs.*

Based on the analysis, it could be seen that firms in the early phases used effectuation to a greater extent in decision-making while they relied more on causation towards the latter phases. Moreover, a closer examination based on a qualitative investigation provided preliminary evidence according to which the decision-making logic seems to moderate the effect of the antecedent factors on growth and survival. This is a very interesting finding as it highlights the importance of decision-making logic for the growth and survival of international new ventures.

## 5. Discussion and conclusion

The novel contribution of this study is its examination of the decision-making logic (Sarvasathy, 2001) associated with growth phases and survival (Sapienza et al., 2006) of high-technology business-to-business (Hughes & Morgan, 2007) INVs (Oviatt & McDougall, 1994) originating in small and open economies. For industrial marketing scholars, our study provides knowledge of the growth and survival of INVs in the high technology, business-to-business field, and of the influence of antecedent factors and decision-making logic. As many INVs are found especially in the business-to-business field, these results are especially relevant for business-to-business marketing. The novel contribution to business-to-business marketing is that effectuation logic can enable rapid international commercialization of products and is reflected in the way industrial firms leverage the resources of business partners in distribution and marketing in an uncertain environment. We answer to the recent call for a more holistic picture of managerial decision making in business-to-business context (Forkmann et al., 2012).

The study depicts four critical phases in INV growth. Recently, the assumptions of some earlier models have been challenged, especially the number of phases and linearity (Levie & Lichtenstein, 2010; Phelps et al., 2007). We agree that the number of phases may vary in different contexts. However, our case analysis showed that in high-technology business-to-business INVs originating in small and open economies there were certain subsets of managerial and foreign growth problems that could be logically grouped in these four phases. We found, however, that development is not always linear as retrenchments may also occur. We found that in addition to survival crises, the INVs faced management and foreign growth problems that required solutions before they could progress to the next phase. In any phase they may either survive or fail.

We contribute by developing a model that includes a more in-depth understanding of the dynamism related to the state and change aspects of growth and to the survival of INVs than that of earlier literature. In addition to depicting the growth phases and related dynamism of INVs, the study increases understanding of the factors that contribute to change in the growth and survival state of an INV, thus also contributing to the resource-based view, the dynamic capability perspective, and the literature on INVs related to the entrepreneurial orientation and opportunities. In analyzing growth and survival, we identified the crucial role of both discovered and created opportunities in driving growth (Alvarez & Barney, 2007) and the importance of learning for survival. (March, 1991). Opportunity creation and explorative learning were most important in the early phases while, opportunity discovery and exploitative learning became more important in latter phases. Moreover, we contribute to discussion on the role of resources and capabilities in solving growth problems and managing survival crises, thereby enabling transition to the next state (Sapienza et al., 2006).

The article suggests that in order to achieve growth and reduce global growth-related investment and the risk of failure, it is necessary for INVs to leverage the resources of network actors (Cook & Emerson, 1978; Ford et al., 1998, p. 46; Gabrielsson & Kirpalani, 2004). This is particularly important in the business-to-business relationship (Forkmann et al., 2012). Although network capabilities were found to be important, they do not eliminate the need to develop substantial capabilities with regard to technology, customer understanding, and marketing. We could also find patterns when certain capabilities were especially important during growth. Technology capabilities were most important in the introduction phase, while marketing and networking capabilities became more important for advancing through the growth phases. Management capabilities were especially important to facilitate transfer between phases, but also when solving growth problems as well as when facing survival crises. Dynamic capabilities were important for being able to integrate and reconfigure the substantive capabilities to respond to the requirements at particular phases. We further contribute by clarifying the role of entrepreneurial orientation and its influence on growth and survival (Hughes & Morgan, 2007; Knight & Cavusgil, 2004; Lisboa et al., 2011). While a strong entrepreneurial orientation is mainly useful to achieve growth in the INV creation phase; an overemphasis in successive phases may even jeopardize survival. Hence, firms need to turn from agility to somewhat more rigidity when advancing through the phases.

Moreover, the research contributed to the understanding of INV firm behavior and decision-making (Cyert & March, 1963), namely with respect to effectuation theory (Read, Dew, et al., 2009; Read, Song, et al., 2009; Sarasvathy, 2001), by providing new knowledge on the role of decision-making logic in moderating the relationship of the factors discussed above. Effectuation-based decision-logic increases the role of opportunity creation as an important antecedent for growth as well as the importance of explorative learning for long-term survival. This logic also means that the role of dynamic and networking capabilities in growth and survival become even more important because they are required for successful effectuation logic. Moreover, the effect of an entrepreneurial orientation is reinforced as this logic brings the entrepreneur's characteristics even more strongly into the decision-making process. This contributes to research that has called for a better understanding of decision-making in business-to-business contexts (Forkmann et al., 2012), INVs (Andersson, 2011), and of the moderating factors in for example the entrepreneurial orientation–performance relationship (Covin et al., 2006; Rauch et al., 2009). The novel finding is that while the earlier management literature has identified a number of factors driving the growth and survival of firms, our findings show that it is crucial to take into account the decision-making logic of entrepreneurs as an important internal contingency factor that either mitigates or strengthens the influence of the antecedent factors. By integrating the earlier management literature and effectuation theory we can understand the joint effect these factors have on the growth and survival of INVs. The use of effectuation versus causation logic also varies during firm growth, and therefore improves our dynamic understanding of the development. This increased understanding also contributes to the earlier marketing literature based on contingency theory that has emphasized the importance of studying contingency factors (Gabrielsson, Gabrielsson, & Seppälä, 2012; Zeithaml, Varadarajan, & Zeithaml, 1988).

Marketing managers working in the business-to-business field can also learn from the results of this study. They need to assess their resources and capabilities and to pursue emerging opportunities and contingencies that will generate optimal growth, but also to take the risk of non-survival into account. Moreover, active development of networks may facilitate growth and increase the odds of survival. Entrepreneurs may also benefit from the use of effectuation logic in decision-making, especially in the early phases of development. This may help INVs suffering from the liabilities of smallness, newness, and foreignness to compete successfully with local incumbent firms.

Effectuation logic can mitigate the need for the firm's own resources in growth and survival. Moreover, this logic brings to the forefront the importance of leveraging the entrepreneur's own qualities, the drive for opportunity creation, learning through trial and error, and the use of existing networks.

Generalization based on case study research is often considered challenging. By acquiring a thorough knowledge of the phenomenon the possibilities for “naturalistic” generalization have been increased in this research (Stake, 2000). As readers recognize essential similarities to cases of interest to them, they can use the results in the context of their interest as applicable. By using a multiple case study research design, replication (Eisenhardt & Graebner, 2007), and explanation-building logic (Yin, 2009), generalization back to theory has been further increased. Moreover, the study results are expected to be most relevant for high-technology business-to-business INVs originating from SMOPEC countries. However, despite this conclusion, one should be cautious about generalization beyond the INVs studied. It is up to future research to prove whether generalization to a larger population is possible. The relationships between the state and change factors in our model were found to be complex and future studies could further explore the causative nature of the state and change factors and whether the configuration of resources and capabilities also mark a phase shift. It would be fruitful to conduct a quantitative study of the growth phases of INVs and examine how well the model describes the growth stages of these companies, the survival crises they face, the antecedent factors, and their decision-making. A comparison of INVs from different countries and industries could provide further information on the generalizability of our model.

## Acknowledgments

The authors are grateful for comments received from the anonymous IMM reviewers on this article and from Professor Nicole Coviello on a previous version. They extend their gratitude to the entire research group and participating firms. They also acknowledge the financial support of the Finnish Funding Agency of Technology and Innovation and the Swedish Cultural Foundation in Finland.

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**D.Sc. Peter Gabrielsson** is Professor of International Marketing at the University of Vaasa, and Adjunct Professor of International Business, Aalto University School of Business, Finland. His teaching covers areas such as export and global marketing and his research interests include the globalization process of firms, born globals, globalizing internationals, and global marketing strategies. He has lead several large research projects in these areas and published in journals such as *Journal of International Marketing*, *Industrial Marketing Management*, *International Business Review*, and *International Marketing Review* and has served as a reviewer in a number of international journals. He has a long experience in senior management positions at Nokia and other global ICT firms.

**D.Sc. Mika Gabrielsson** is Professor of International Business at the University of Eastern Finland, Adjunct Professor at Aalto University School of Business, and a Visiting Professor at University of Portsmouth. His teaching covers areas such as internationalization of the firms, global marketing/sales management, and research interests include among others rapid globalization. He has led several large research projects, and published in over 150 publications, and is a frequent reviewer in many journals, and serves for instance at the editorial board of *Industrial Marketing Management*. Before joining the academic world he held several senior positions in purchasing and marketing of global high-tech companies, which he continues to consult.