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THE PROCESS OF FIRM GROWTH

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Editorial Paper

The Process of the Growth of Small and Medium-Sized Enterprises (SMEs)

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Introduction

Firm growth is a central topic in the literature on entrepreneurship, strategic management and industrial organization, among others. For an individual entrepreneurial firm, growth is an evidence of the return of the entrepreneur's investment and self-fulfillment. Growth is also a condition of survival for young and small businesses, as growing firms are found less vulnerable to failure than non-growers (Stam et al., 2006). The macroeconomic importance of firm expansion was recognized in the 1980s, when the phenomenon of gazelles or high-growth firms was first described as those capable of intense size increases within a limited time span (Birch, 1981; Birch & Medoff, 1994; Birch et al., 1994; Storey, 1994; Coad, 2009; Acs et al., 2008). According to empirical research gazelles form a small fraction of business population. However, they represent a disproportionally large share in new job creation (Storey, 1994; Coad 2009; Stam et al., 2006; Acs et al., 2008). Growing firms are also more likely to generate innovations, specifically product innovations involving technological advancements (Coad, 2009; Schreyer, 2000; Storey, 1994; Smallbone et al., 1995).

Both researchers and policy makers interested in expansion, focus on rapidly growing firms and on small and medium-sized enterprises. This interest in high-growth enterprises is justified by the observation that the

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remaining population either grows slowly or does not perform any expansion (Coad, 2009). At the same time, gazelles are predominantly young, small and medium-sized enterprises (SMEs). The dynamics and economic contribution of firms' growth are negatively associated with age and size, which corresponds to the observation that job losses are generated mainly by the established, large and non-growth firms (Acs et al., 2008).

As firm expansion and growth have proved to be a condition for competitive advantage both at the level of individual firms and at the level of the economy at large, the phenomenon of firm growth has become a focus of research. One of the main purposes of this increasingly preeminent research stream is to provide recommendations for firm management and for economic policy, undergoing the risks and challenges in achieving expansion. However, in order to provide these recommendations, we need to better comprehend the entrepreneurial motivations and the attitudes towards growth, the stimuli and impediments to company growth, the potential mechanisms to firm growth and modes of expansion.

This special issue seeks to contribute to the knowledge base on the growth process of entrepreneurial firms, which is an emerging stream of research on firm growth. This emerging stream complements the existing perspectives on expansion, which are more focused on: 1) companies' internal adaptation mechanisms, as reflected in life cycle models, and on 2) determinants and predictors of firm growth (Dobbs & Hamilton, 2006; McKelvie & Wiklund, 2010). We present the focus provided in this special issue as complementary to existing approaches, aiming also to contribute with new findings in addressing some yet underexplored areas. The emerging stream of growth process refers to why and how growth is implemented through proactive entrepreneurial actions and decision-making processes, which are presented in complex organizational and environmental contexts, including cause-effect mechanisms in the history of company development. This holistic approach is a constituent feature of studies on the growth process. It differentiates from the currently dominating focus on the determinants of individual firm's growth and from the earlier stage models of internal adaptation to the challenges imposed by expansion.

In the following sections of this introductory paper, we discuss first the stream of research on the growth process in connection with the extant literature on firm growth. Then we highlight the contribution of the individual papers included in this special issue as well as the contribution aimed at by the entire issue as a whole. Finally, the conclusion delineates some potential pathways for further research as a result of the findings provided by the special issue.

The research on the firm growth process and its relationships with other perspectives on firm expansion

Studies on firm growth have evolved into a number of approaches, which have in turn addressed various research gaps, questions and problems through the use of differing methodologies (Gilbert et al., 2006; Dobbs & Hamilton, 2006; Davidsson et al., 2006; McKelvie & Wiklund, 2010). In particular, in this introductory paper we will focus on three of them.

The first, which refers to the early stream of life cycle models, deals with how to manage a company that has achieved substantial growth (Dobbs & Hamilton, 2006; McKelvie & Wiklund, 2010). The numerous models of stage growth, such as those by R. Greiner (1972), R. Scott and R. Bruce (1987), N. Churchill and V. Lewis (1983), assume determinism of some strictly defined phases. However, these approaches do not reflect the reality of irregular and idiosyncratic patterns of firm expansion. Moreover, the critiques of this approach point to a lack of theoretical background and empirical support that would prove validity of the life cycle pattern to organizational development. This approach is still considered useful in scholarly work though, given that it serves more as a framework of development options and scenarios, than as a deterministic vision of firm pathways. Recently, Levie and Lichtenstein (2010) carried an extensive review of growth stage models and proposed their reconceptualization into a 'dynamic states approach', freeing the conception from previous deterministic views, and assuming heterogeneity of firms and idiosyncrasy of their development patterns. This may provide a revitalization of the conception towards more open and situational adaptation of the life cycle framework, where the triple of opportunity recognition, business model, and value increase is regarded a mechanism that explains a firm's specific development stage (Levie & Lichtenstein, 2010). Overall, life cycle models treat expansion as a challenge to managerial systems, requiring continuous adaptation and transformation, rather than as a desired outcome. This stream is thus built on the management systems and the routines required when dealing with growth by adapting and transforming the internal organization. In other words, it explains how to react to and manage growth, but not how to proactively achieve growth by running specific activities, processes and routines, and how entrepreneurs make decisions and perceive the rationales, mechanisms and modes in implementing the expansion.

Growth as a desired outcome became a focus of the second stream of studies that emerged after the importance of gazelles was identified, particularly for creation of employment and the definition of innovation policies. This currently dominating stream intends to address what are determinants and predictors of firm size escalations, to inform both policy and management practice. One of the main contributions of this group of

studies lies in the identification of a number of factors correlated with firm expansion, characterizing the entrepreneur, the firm and its strategy, that proved to be significant in the majority of the works (Barringer et al., 2005; Coad, 2009; Moreno & Casillas, 2007; Gilbert et al., 2006; Macpherson & Holt, 2007; Storey, 1994). However, uncertainty still remains about the real mechanisms of growth and the cause-effect relationships that may arise during this process, i.e. which factors are growth determinants, and which are only associated to or stimulated by growth (Dobbs & Hamilton, 2006; Wright & Stigliani, 2013). Moreover, the meaning and importance of some factors are not fully consistent (Achtenhagen et al., 2010; Dobbs & Hamilton, 2006). The observed ambiguity is attributed to differing methodologies and measures of expansion adopted in these predominantly quantitative studies (McKelvie & Wiklund, 2010; Shepherd & Wiklund, 2009), which requires the conduit of case studies using different approximations and methods, as the papers in this special issue aim at.

Finally, the third new and emerging pathway of research complements and broadens the earlier studies by focusing on the growth process (Davidsson et al., 2006; Leitch et al., 2010; McKelvie & Wiklund, 2010; Stam, 2010; Dobbs & Hamilton, 2011; Wright & Stigliani, 2013; Koryak et al., 2015). It intends to address some under-researched issues by exploring why and how growth is implemented, while assessing entrepreneurs' decision making routines and processes (Wiklund & Shepherd, 2003; Wiklund et al., 2003; Garnsay et al., 2006; Hansen & Hamilton, 2011; Wright & Stigliani, 2013). Relative to the first stream, it seeks to explain proactive decisions and activities in implementing growth, not only following adaptive and reactive strategies. Alternatively to the second stream, it intends to unveil mechanisms and cause-effect relationships among the factors leading to growth, not only the individual success factors. During periods of intense growth, there may be changes and trade-offs in the modes, rationales, motives and mechanisms of company behavior, stemming from the changing characteristics of its resources and the environment in which firms are embedded. These changes can explain differing assumptions and empirical verifications of leading theoretical frameworks on growth, and find inconsistencies or discrepancies with to-date research on growth determinants. Such a research focus requires in-depth, explorative studies, investigating the phenomenon in specific contexts to explain the entrepreneurs' perceptions, decisional rules and actions. These findings may form new theoretical and empirical approximations, which eventually may require further quantitative studies, such as identifying valid growth determinants.

The research streams we have discussed above have different purposes and concentrate on different problems, providing often complementary

answers. Besides contributing with specific insights into the growth phenomenon, they also mutually enrich and reinforce one another. Table 1 presents the prospective input from the growth process perspective to other streams and in what way this perspective can draw upon the more established approaches.

Table 1. The research streams in firm growth and the interrelations among these perspectives

Research stream on firm growth	Studies on growth determinants and predictors	Studies on firms' internal adaptation after achieving growth (stage models)	Studies on growth process
Research questions	What drives growth?	How to manage a firm that has accomplished growth?	Why and how to achieve growth?
Outcomes	Features and factors correlated with growth, characteristics of the entrepreneur, the firm, and its strategy.	Internal structures and management systems that require adaptation. Suggestions of potential business models as a response to opportunity recognition and the need to create value.	The entrepreneur's decisional rules with regard to motives, rationales, mechanisms and modes of growth in a specific context, depending on firms' capabilities and the environment in which they are embedded .
Underexplored problems/ Limitations	Underexplored mechanisms of growth (cause-effect relationships); ambiguity in some of the determinants identified to date.	Underexplored proactive approaches to accomplishing growth; reactive growth strategies; unrealistic determinism of stage models.	A potential limitation might be the excessive idiosyncrasy of the findings, which are dependent on particular and complex contexts that may lead to a difficult generalization.
Can the streams benefit one another?	Can benefit from and contribute to research on the firm growth process by pointing to drivers of this process.	Can benefit from and contribute to the studies on the firm growth process by showing how business models need to change and adapt to the environment in response to growth.	Can benefit from and contribute to the studies on firms' growth determinants by identifying contingencies under which ambiguous determinants hold. Can also contribute to the studies on the management of firm growth by signaling and assessing how specific business models (stages) are created and how these may foster firm growth in the different stages.

The research on the firm growth process can draw upon the knowledge on growth determinants and on the internal management of a company that achieved growth, as these findings are important inputs into the explanation of why and how expansion is achieved. Conversely, the research on the growth process of firms can benefit the stream on growth determinants by identifying contingencies under which some factors hold and others do not, thus reducing the ambiguity of to-date findings. These contingencies can be explored due to the emphasis of the growth process studies on the contextual issues. The stage models, in turn, can be enriched by the findings on growth process that would show how specific business models are created to foster expansion.

Theoretical background of studies on the firm growth process

The majority of the entrepreneurship research on firm growth applies Penrosian and follows a resource-based view (the RBV) approach. The foundations of firm growth conception were laid by Penrose (1959) and evolutionary economists such as Nelson and Winter (1982). As a result, and in parallel to these contributions, the resource-based approach to decision-making on firm scope and size was further developed (Peteraf, 1993; Wernerfelt, 1984; Barney, 1991; Hamel & Prahalad, 1990; Kogut & Zander, 1992). Penrose perceived growth as a process of learning and development of capabilities, eventually resulting in scope and size enlargement. Concepts such as core competence and core-related capabilities (Hamel & Prahalad, 1990), absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002) and dynamic capabilities (Teece et al., 1997, Teece, 2007) have comprehensively provided explanatory power with regard to learning and knowledge development that lead to innovative outcomes. The heterogeneity of firm capabilities is thus reflected in the differences in their competitive positions and the ways firms achieve growth.

The RBV logic is applied in the majority of the entrepreneurship studies on growth determinants. These studies focus on the internal characteristics of the entrepreneur, the firm, and its strategy. Similarly, the classical growth stage models adopt an internal focus on firm resources and management systems. In spite of the capability-oriented thinking, the life cycle studies and studies on growth determinants are inductive and empirical rather than deductive and theory-driven. Therefore they rarely apply the core concepts of the RBV, including its developments such as absorptive capacity and dynamic capabilities.

Absorptive capacity (AC) is one of the key concepts that emerges from the understanding of innovation regarding the internal usability of external

knowledge (Cohen & Levinthal, 1990). The existing evidence has discussed how companies with good levels of AC are more likely to absorb external knowledge through the establishment of cooperation agreements, what influences the returns these companies get from product and process innovations.

Parallel to the conception of AC, new perspectives on dynamic capabilities have been developed. Dynamic capabilities (DC) are defined as higher level competences that determine the firm´s ability to integrate, build, and reconfigure internal and external resources/competences to address, and possibly shape, rapidly changing business environments (Teece et al. 1997; Teece, 2007; Eisenhardt & Martin 2000; Helfat et al., 2007; Di Stefano et al., 2010). Teece distinguishes between what would actually be organizations' (group) and individuals' routinized behavior, and those DC that fall outside standardized analyses that search for the optimum situation. Teece identifies ordinary capabilities with routines that address repetitive paths over time, which are embedded in organizations and employees and would be imprinted in the algorithms and heuristics of how business organizations carry out and develop their everyday activities. Building on the RBV of the firm, Eisenhardt and Martin (2000) introduce a model that reframes the previous DC approach. The purpose of their model is to know how an organization's competitive edge can be maintained over time.

Considering the nature of AC and DC, two assertions can be made as to their relationships with the firm growth process. First, their association with growth, may be captured as a feedback process (results of growth and determinants of growth), as well as direct and indirect influences. Second, the influence of these two constructs on firm growth and expansion needs to be researched in a longer term and continuous perspective rather than focused on some points or limited periods of time.

According to the first assertion, growth is both a result and stimulus of the organization's learning processes, in which both AC and DC play a key role. Moreover, the influences of AC and DC can be described as both direct and indirect. Direct influences can be manifested as a realized AC capacity and as seized opportunities in the DC perspective. The outcomes of firm resources and competences, such as introducing product, process and management innovations (Ahlin et al., 2014; Kotabe et al., 2011) that replace the existing routines and ways of solving problems by more efficient ones are included here (Zollo &Winter, 2002; Zahra et al., 2006). This evidence of realized AC and seized opportunities (due to DC) directly translates into performance (i.e. employment, sales), and corresponds with a number of findings in the empirical research on growth determinants. The direct influences of AC and DC can be recognized when researching firm behavior in periods of rapid

growth. The indirect influences are associated with potential AC and the ability to sense the opportunities within the DC perspective, i.e. capabilities that form conditions for absorbing external knowledge and sensing the opportunities to replace existing routines. These are capabilities such as the entrepreneurial orientation and the competence level of management and personnel, which affect growth indirectly and in a long term perspective. The indirect influences of AC and DC do not provide an immediate effect on performance and growth and they can be detected in a longer term perspective that is not limited to the punctuated periods of rapid expansion (Gancarczyk & Gancarczyk, 2016).

Correspondingly, according to the second assertion, organizational learning can be comprehensively understood with the adoption of longer-term and evolutionary perspectives (Freiling et al., 2012). From this point of view, continuous and incremental development is punctuated by periods of revolutionary change and intense expansion. Therefore, the full nature of capability development would be difficult to capture when focusing on limited time spans of rapid growth only. The empirical evidence within the research on growth determinants focuses mainly on periods of high growth, which may provide limited evidence on the relationships between growth and AC and DC respectively.

The conceptions of AC and DC are focused on how internal capabilities impact the competitive advantage of firms, as moderated by the firm capacity to adapt and change in response to the environment (Gómez-Uranga et al., 2014). Consequently, the nature of growth as a learning process favors case-based, qualitative and in-depth research in the longitudinal perspective. On the other hand, the long-term and learning perspectives on the development of capabilities in response to the environmental challenges and opportunities is also applied in the studies on firm and industry expansion within the literature of evolutionary economics (Nelson & Winter, 1982), industrial organization (Klepper, 1997, 2007) and organizational ecology (i.e. population ecology of organizations) (Carroll & Hannan, 2000). In these studies, quantitative approach based on longitudinal data regarding particular industries is adopted to investigate the influence of competitive environment on firm success or failure. This environmental impact on growth prospects is also present in the current conception of entrepreneurial ecosystems (Mason & Brown, 2014; Isenberg, 2011). However, the entrepreneurial ecosystem scope goes beyond the micro- or industrial environment, and also embraces meso- and macro-environmental components (Dopfer et al., 2004). The systemic approach of entrepreneurial ecosystems was described with a number of models including a variety of components, which may be

clustered under the labels of actors, resources, institutions, and networks (Fornahl et al., 2015; Gancarczyk, 2015).

This special issue aims at providing new empirical evidence on firm growth, and it can be positioned within a positivist approach in which deductive logic is followed by formulating research questions and hypotheses based on extant theories. The theoretical background of the papers is rooted in the RBV, including AC and DC perspectives, and in the theory of entrepreneurial environment or eco-system. On the other hand, the contributions of this issue are eclectic in implementing this positivist approach. Some studies consequently follow it with the use of quantitative and empirically-oriented methods. Others apply a qualitative and case study methodology, with the use of rich data to be matched with a theoretical background applied. This characteristics link them with the interpretivist method. All the papers, however, are strongly focused on the contextual issues and specificity of actors, places and institutions. Even if as a result some theoretical contributions are obtained, the goal is not to develop new theoretical views or conceptual approaches that fill the current gaps in the literature, but rather to provide new empirical evidence in relation to firm growth processes.

Contributions

The papers included in this special issue add to our understanding on the process of firm growth, using varied methodologies and theoretical approaches, even if the RBV and evolutionary logics dominate. They also contribute to the research on growth determinants and on business models in the firm life cycle. The authors devote a considerable attention to the context of their investigations, presenting both the development pathways of firms and environmental conditions influencing them. Moreover, they consider the time perspective as an important part of that context.

The paper by Claudia D´Annunzio, Mariela Carattoli and Dolores Dupleix (2015) – "Dynamic capabilities associated with a firm's growth in developing countries. A comparative study of Argentinean SMEs in the software and tourism industries" - deepens our understanding related to the concept of DC and firm's growth in the context of developing countries. The study is based on the analysis of eight Argentinean SMEs in the software and tourism industries. It presents a comparative multiple case study focused on the process by which firms develop DC and how these contribute to their growth. The paper aims to shed new light on how SMEs develop capabilities to grow in the specific context of developing countries with resources constraints. The key contribution of the study is that SMEs develop DC mainly through an

emerging process of iterative experimentation rather than through strategic planning, a process that involves the coordination of organizational actions and resources, and in which firm managers play a key role. Considering the methodology, focus on learning in growth, and on entrepreneurs' perceptions, the paper is positioned within the stream of growth process research.

In line with the previous paper, Andrzej Lis and Agata Sudolska (2015) – "Absorptive capacity and its role for the company growth and competitive advantage: the case of Frauenthal Automotive Toruń company" – aim to study the role of AC for firms' growth. In particular, they analyze how DC can lead firms to obtain a relative competitive advantage through open innovations. Through a case study in the Frauenthal Automotive Toruń company, the authors explore how the routines and best practices associated with the firm AC contribute to its success. One of the key messages of their paper is that the development of skills and capabilities allows firms to recognize valuable knowledge in the environment, acquire, assimilate, transform and develop it in the form of innovations. The paper adopts an evolutionary, long-term and qualitative method in studying growth, thus corresponding to the research on the process of firms' expansion.

The paper by Urban Pauli (2015) – "In what to invest after surviving – the investment structure of growing SMEs" - adopts a life cycle pattern to investigate the structure of investment in SMEs, depending on their phase of growth. The research is based on a quantitative study of 286 Polish SMEs, clustered in various stages, according to the author's model, which emanates from a synthesis of a number of life cycle concepts. The RBV logic is adopted in theoretical background of the study and in seeing growth as conditioned by the appropriate choice of resources to invest in. He also emphasizes performance issues, and finds relationships between the growth stage, the investment structure and the firm's outcomes. These conclusions support the reasoning of a dynamic states approach, as the author is not focused on a predetermined sequence of development for an individual company, but on the choice which resources to develop, depending on the state of the firm. The most important observation is that the entrepreneurs that accomplish high performance adjust their investment structure to the requirements of a specific phase of development, demonstrating responsiveness to the changing context of their businesses. Alternatively, the entrepreneurs featuring minor performance do not change and adjust their investment structure, but rather keep it stable regardless of the growth stage.

The paper by Renata Lisowska (2015) – "External determinants of the development of small and medium-sized enterprises – empirical analysis" – puts emphasis on how the external environment influences SMEs' development and growth. This analysis differentiates by a thorough and

systematic categorization of specific levels of environment and of the impact of specific factors (barriers and stimulants). The assessment of specific factors was provided by the research sample of 590 SMEs. The author refers to the particular context for her research, both in terms of the object of study and by referring to the extant Polish findings on environmental conditions of SME development. This approach is justified by the complexity of the environment, which allows for generalizability of the findings in the specific conditions of a region or a country. The research belongs to the stream on growth determinants. However, it provides important insights into the entrepreneurial perceptions of the environmental influences in the process of development and growth. The main message is that Polish entrepreneurs perceive their environments in terms of barriers rather than in terms of stimulants. Moreover, the findings are informative for policy and management of SMEs as they point to the main impediments of growth and development as perceived by the entrepreneurs. The study confirms the findings from the earlier Polish research in this area, which evidences the limited or non-existing improvements in shaping the environment by policy makers on the one hand, and similarly, the limited improvement in SMEs' capabilities to face these challenges on the other. In the case of meso- and micro-environments, the sets of barriers and stimulants differ for firms in different size classes. This observation calls for policy measures tailored to micro-, small and medium-sized firms.

The paper by Tuomo Heinonen and Francisco Javier Ortega-Colomer (2015) – "Regenerative medicine as an emergent cluster in Tampere Region" – focuses on clusters as an important element for regional economies. The authors discuss how emergent clusters can be a central means to provide regional economies additional diversification. The paper focuses on regenerative medicine as an example of such emergent clusters. The study contributes to the understanding of emergent cluster development in science-based industries in their embryonic and early stages. The paper starts by describing the main obstacles that might eventually impede the proper development of emergent clusters. It also finds how innovations emerge in the cluster and what the main implications for the territory are. The relevance of the study lies in that in embryonic science-based industries, products and services are new knowledge-based, and therefore require the involvement of the academia as a booster and the driver of the emergent cluster. In line with the conclusions raised in the previous paper by Lisowska, the paper concludes by calling for tailor-made socio-economic policies at the meso-level.

Finally, the paper by Angelo Dossou-Yovo (2015) – "Entrepreneurial growth aspirations and familiarity with economic development organizations:

evidence from Canadian firms" – intends to add to the research on the association between firm growth and the entrepreneurial ecosystem. Specifically it focuses on the relationships between the entrepreneur's familiarity with the economic development organizations in this system and entrepreneurs' willingness to expand. The logic of this investigation differentiates from to date studies in that the author does not investigate the possible dependence of growth aspirations on the networking with the organizations in the ecosystem. The main research question concerns how growth aspirations affect networking behavior as evidenced by familiarity with business development organizations. Such an approach is founded on the assumption that entrepreneurs who intend to pursue growth search for the adequate resources in the ecosystem and address key actors in this environment. The study is based on a large set of data (1400 companies from the Halifax metropolitan area in Canada) obtained in the four-wave survey in years 2011-2013. It offers various implications for entrepreneurs seeking growth, and for policy-makers and providers of business support services who can better recognize their target groups, needs and motivations. Summing up, the findings confirm that the entrepreneurs who intend to expand are more inclined to have networking links with business support organizations than those who do not intend to grow. This insight adds to the research on planning and managing growth and on the sources of knowledge and capital in this process.

The table below provides a short illustration of the main results of the papers in the special issue, emphasizing how each of them can also contribute to the different streams on the growth processes identified in Table 1.

The papers in this issue are positioned in different research streams on entrepreneurial growth. However, all of them contribute to the related streams. As it was indicated in Table 1, their input into the studies on growth process includes the identification of resources and management systems conducive for the pursuit of expansion, the roles of specific actors such as entrepreneurs, managers, employees and business environment organizations, and describing the role of the context at the regional and country levels. Moreover, the papers broaden our understanding of the entrepreneurs' motivations for growth and the mechanisms through which they achieve it.

Table 2. Contributions of the papers in the special issue to the research streams on firm growth

Research stream on firm growth	Studies on growth determinants and predictors	Studies on firms' internal adaptation after achieving growth (stage models)	Studies on growth process
D´Annunzio et al., 2015	The role of dynamic capabilities in firm growth.	Dynamic capabilities and the phases of strategy development and execution.	Capacities to learn, sense, filter, shape and calibrate opportunities. Structures, procedures, designs and incentives for seizing opportunities.
Lis & Sudolska, 2015	Role of absorptive capacity and open innovation for firms' growth and competitive advantage.	Firms need to recognize valuable knowledge in the environment, acquire, assimilate, transform and develop/ exploit it to benefit from open innovation. Routines, lessons and best practices in absorptive capacity. Absorptive capacity as a process.	Firm growth as an outcome of absorbing and utilizing new knowledge. Importance of executives and employees' learning from external sources. Small steps towards novelty.
Pauli, 2015	Proactive investment behavior associated with firm performance.	Growth firms need to adapt their investment decisions to specific requirements of the life cycle stages.	The entrepreneurs that achieve high performance monitor their capabilities and external challenges in the process of growth and they differentiate the investment structure in particular resources according to their specific needs. An integrative model of firm growth stages is offered.
Lisowska, 2015	Identification of barriers and stimulants of SME development and growth at the micro-, meso- and macro-environmental levels. Benchmark for other studies performing a systematic analysis of the levels of the environmental influences in other contexts of time and place.	Barriers and stimulants of firm development arising from micro- and meso-environments differ depending on SME size.	The findings are informative of entrepreneurs pursuing their growth in the Polish context. The set of barriers and stimulants as a guidance for the entrepreneurs to pursue their own growth strategies and as a framework for researchers to be tested in the specific process of firm growth. The factors of SME development and growth describe the entrepreneurial ecosystem in Poland regarding its actors, resources, and activities.

Research stream on firm growth	Studies on growth determinants and predictors	Studies on firms' internal adaptation after achieving growth (stage models)	Studies on growth process
Heinonen & Ortega-Colomer, 2015	Identification of obstacles eventually impeding the proper development of emergent clusters in their embryonic and early stages. Competence bloc theory can allow the evaluation of the required competencies for economic growth and successful innovations from both a business and innovation point of view.	Cluster life cycle theory can be reinforced by focusing attention on the commercial engine that enables growth of firms. Firms in emergent science-based clusters are dependent on the knowledge generated within academic actors.	Emergent clusters are important for regional economies. Tailor-made socio-economic policies at the meso-level are required to guarantee the survival and further development of emergent clusters and the firms within.
Dossou-Yovo, 2015	Familiarity with economic development organizations associated with growth aspirations.	When planning for growth, companies actively establish links with actors in the ecosystems to build the internal resources needed for expansion.	Contributes to understanding of growth aspirations as motives for networking with actors in entrepreneurial ecosystem. Suggests mechanisms of resource acquisition from the ecosystem as conducive for growth.

Further research

This section aims to provide a short discussion of the main gaps identified by the group of papers included in the special issue. With it, we aim to open potential further research paths that may enlighten the different streams of the literature discussed above. Moreover, we can state that the papers suggest theoretical and practical implications regarding two issues associated with the growth process of firms, namely 1) entrepreneurial ecosystems and 2) learning and capability development.

In their paper, D´Annunzio et al. find that for entrepreneurs, it is essential to understand the business ecosystem they are embedded it. On the one hand, the ecosystem is what provides them with the necessary contacts to gain access to the knowledge they need (e.g. identifying other entrepreneurs, getting to know their entrepreneurial orientation, making personal and professional contacts, getting involved in other networks). On the other, it also provides entrepreneurs the abilities and experience to make strategic decisions. Thus, it would be required to gain new knowledge and

understanding on the dynamics of business ecosystems, how these emerge, evolve and shape not only the dynamics of the actors within but also have the ability to shape other related ecosystems. Increasingly, and particularly in recent years, we are witnessing an increasing attention to the meaning and the implications (both in managerial and in policy terms) of business ecosystems. A new literature is emerging in this regard, and thus, more contributions are needed, in relation to entrepreneurial business ecosystems, and the role trust and social networks play in these.

Heinonen and Ortega-Colomer are also in support of new research paths that may shed new light on the support of pro-innovative thinking systems, such as emerging clusters in science-based industries, though new clusters need not necessarily be limited to these. In this sense, the authors provide a number of dimensions that can help these new clusters or ecosystems to consolidate: have certain unique competences that may create the necessary incentives to attract and keep keystone organizations, availability of a network of support (i.e. service of manufacturing) firms, entrepreneurs and venture capital organizations, long-term commitment and support by public bodies, effective knowledge transfer mechanisms being in place, having (internally) or gaining access to (external) demand so that firms can scale-up and further advance their production, providing access to experiences knowledge on intellectual property rights and their management, etc.

Lisowska identifies the barriers and stimulants to SME development in Poland, which can be treated as characteristics of the entrepreneurial ecosystem at the country level. This research points to the key components of this ecosystem, including macroeconomic trends and regulations, meso-, and micro- or competitive environment influences, as perceived by the entrepreneurs. The findings are informative for entrepreneurs and for policy purposes in researching the specific context for SME growth and development in terms of environmental conditions in a specific period of time. It calls for further research to monitor the trends and changes in the sets of determinants and their evaluation by entrepreneurs. Another opportunity for further research is to identify the differences in the entrepreneurs' perceptions of the environment depending on the stage of development (such as growing, mature or declining businesses). This matching approach would provide a more nuanced picture of the environmental challenges for growers versus non-growers.

The research by Dossou-Yovo points to the importance of the resources in business ecosystems for the entrepreneurs who intend to grow. The results prove that potential growers are active in networking with the organizations offering public support in knowledge and capital acquisition. The extant research provides the evidence of networking as one of the success factors,

i.e. stimuli for growth. This research offers another observation, namely that networking is also a result of the entrepreneurs' intentions to grow, as they actively search for the resources in their ecosystems. There are many potential areas of future investigation that arise from the current findings. Among others, they refer to the role of networking and network management in pursuing growth, to the association between the type of actors in the ecosystems and the specific challenges and stages in the growth process. Another area for further studies refers to policy issues, such as the types of measures and the types of business support organizations that are important for firms that plan and implement growth. These potential results may inform policies directed at developing entrepreneurial ecosystems in terms of the actors and the resources that are central in achieving firms' growth.

There are several manuscripts in the special issue which revolve around the concept of capabilities, including AC and DC and the implications these can have both and the level of individuals and firms. As D´Annunzio et al. discuss, at the startup stage, firms are based mainly on entrepreneurs' skills. Thus, a better understanding of entrepreneurs' managerial skills is required, particularly in the context of young firms, in which individual capabilities are extremely important for their further survival and growth. This further need is in line with the findings by Teece (2007) who also concludes that the ability to recognize opportunities is to a large extent dependent on the capabilities of individuals. This further research on DC is however also linked to the previous one on business ecosystems. In fact, if firms are to grow, these need to continuously identify and weigh the opportunities and changing conditions that may arise not only from the environment in which the firms may operate (Gómez-Uranga et al., 2014), but also from those in related markets (Frenken et al., 2007). Thus, entrepreneurs need to be constantly revising and developing their own entrepreneurial capabilities and those of their firms in order to seek for an effective way to guarantee adaptation to the new environmental contexts, what in turn also has clear managerial implications in terms of the need to restructure existing resources and organizational structures as firms grow and environments change.

The case study conducted by Lis and Sudolska links the concepts of AC and open innovation, as two central concepts for company growth and competitive advantage. In this sense, further research could be oriented to provider larger evidence of the DC approach discussed above with these two concepts. However, Lis and Sudolska are among the few scholars who provide not only evidence of the benefits of AC for firm growth and adaptation, but also consider it to be process that can be managed. In this sense, they distinguish the following stages into the AC process: knowledge recognition, acquisition, assimilation, transformation and exploitation. Thus, further

evidence is required on the dynamics and challenges faced by firms, not only in seeking for a larger AC, but also in the management of AC as a process. As Lis and Sudolska discuss, one of the most significant challenges in this regard is related to the mentality of managers and employees. We consider that further research is also here required in relation to the awareness of executes and employees as to AC development, and the introduction of pro-innovative thinking systems and pro-innovative behaviors in a large variety of environments and organizational forms, not only firms. Such knowledge may foster and enable all types of organizations (e.g. universities, hospital, public agencies, etc.) to intentionally create conditions that may favor the acquisition, transformation and exploitation of external knowledge.

Urban Pauli provides evidence that high performing SMEs conduct a proactive strategy in pursuing particular resources rather than others, by changing the investment structure depending on the development stage of their businesses. This represents an important insight into the firm growth process by showing how to implement expansion. This differing investment policy denotes both efficiency considerations and sensitivity to changing needs of the business in response to internal and external challenges. Such a behavior may be an evidence of DC to act, i.e. the entrepreneurs adjust and reconfigure their resources as they sense and seize environmental opportunities to establish a competitive advantage. Further research might explore the association between the investment in particular resources and the conception of DC. Moreover, the current findings inspired Pauli to pose additional research themes, such as the influence of industrial and other characteristics of SMEs on the structure of investment in particular resources. Another option for extending the research is to replicate it in the long-term context, to see how the type of resources pursued in specific life cycle phases affects the entire evolution of individual companies and their performance.

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Dynamic Capabilities Associated with a Firm's Growth in Developing Countries. A Comparative Study of Argentinean SMEs in the Software and Tourism Industries

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Abstract

Although recent evidence suggests that the development of dynamic capabilities (DC) is a key factor to gain and sustain competitive advantages to promote firm´s growth, the question of how SMEs create, identify, and seize opportunities for growth have not been fully explored, particularly in developing countries with scarce resources. The aim of this study is to shed light on how SMEs develop capabilities to grow in the specific context of developing countries with resources constraints. To achieve a detailed description of the processes involved, this study applies a qualitative methodology based on a comparative case study of eight SMEs within the software and tourism industries in Argentine, which have been previously identified as dynamic sectors with high growth potential. Our findings suggest that SMEs develop DC mainly through an emerging process of iterative experimentation rather than through strategic planning. This process involves the coordination of organizational actions and resources, with managers playing a key role.

Keywords: *firm´s growth, dynamic capabilities, SMEs, developing countries.*

Introduction

Recent evidence suggests that the development of dynamic capabilities (DC) is a key factor to gain and sustain competitive advantages to promote firm growth (Teece, Pisano & Shuen, 1997; Teece, 2000, 2012; Helfat et al., 2007; Sapienza et al., 2006; Zollo & Winter, 2002; Eisenhardt & Martin,

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2000). Additionally, many authors concluded that firms develop DC from an early stage (Zahra et.al, 2006) and that DC play a key role in the creation and evolution of startups (Sapienza et al., 2006). Since the introduction of this topic, intense debates have arisen in relation to the theoretical foundations of DC: the nature and the types of DC; the context in which DC are applied; and the relation between DC and competitive advantages (Carattoli, D´Annunzio & Dupleix, 2014).

Particularly, earlier research on DC has primarily focused on large and established companies and has failed to address how SMEs develop DC to identify and seize opportunities to grow (Weiermair & Peters, 2002; Peters & Pikkemaat, 2006; Hall &Williams, 2008; Hall, 2009; Hjalager, 2010). SMEs are important factors for economic and social development in both developed and developing countries (Charles, 2009). Successful SMEs generate employment, require less capital and management skills, and enable developing countries to participate in the global economy. Although some authors have addressed the topic of SMEs' performance and competiveness in developing countries, they focused on the impact of environmental factors rather than on the role of firm-level factors. As a consequence, there is little information on how competiveness of SMEs is created by factors other than the environment (Charles, 2009).

This paper provides empirical evidence on the development of DC in SMEs. The next sections present the theoretical framework of DC and a brief description of the context under analysis. Then, the methodological aspects are described followed by the empirical analysis.

Finally, we show the discussion section and conclusions.

Literature review

The concept of DC

The framework of DC extends the resource-based view (RBV) examining the influences of dynamic environments (Helfat & Peteraf, 2003). Specifically, Teece, Pisano, and Shuen (1997) proposed the concept of DC to describe how leading firms integrated, built, and reconfigured internal and external competencies to gain and maintain competitive advantages in rapidly changing environments. Since then, several researchers argue that dynamic capabilities are essential for increasing competitive advantages (Helfat & Peteraf, 2009; Teece, 2007; Zahra et al., 2006; Zollo & Winter, 2002; Zott, 2003) and for turning resources into improved performance (Wu, 2007).

As defined by Teece et al. (1990, 1997), DC are meta-processes that differ from ordinary capabilities, best practices, and competences in many aspects.

These last concepts focus on the performance of a particular task and refer to "doing things right". Instead, DC refer to "doing the right things" (Teece, 2014). Specifically, DC focus on decisions about sensing opportunities, preparing the organization to seize opportunities, and creating adequate conditions to change and make adjustments in response to new environments.

Specifically, Teece (2007) proposed a DC framework and microfoundations of the capabilities required to sustain superior performance in open markets with high levels of innovation and resources globally allocated. In this regard, DC foster the firm to create, deploy, and protect the assets that support superior long-term performance. Firms with strong dynamic capabilities are intensely entrepreneurial: they not only adapt to dynamic business ecosystems, but also shape them through innovation and collaboration with other companies and institutions. This framework contributed to better understand the foundations of long-run success and help managers formulate strategic decisions. As a consequence, the DC framework explains firm competitiveness more effectively than the RBV (Teece et al., 1997; Eisenhardt & Martin, 2000; Makadok, 2001; Zahra, Sapienza, & Davidsson, 2006; Zollo &Winter, 2002). Since Teece´s research, many scholars have addressed different issues of DC. The majority of this research discusses DC in general terms and only a few studies are focused on defining where capabilities come from or what kinds of processes contribute to building them. However, some academics have recently addressed DC from new perspectives to improve the analysis and provide more empirical results.

With regard to the factors that influence DC, Sher and Lee (2004) studied both manufacturing and service firms and showed that internal and external knowledge management significantly affects DC; Prieto et al. (2009) concluded that autonomy and support are significant drivers of DC in firms focused on R&D and innovation. Another empirical contribution was made by Liao, Kickul, and Ma (2009) who demonstrated that resource stock is positively related to the integrative capability in Internet-based firms. More recently, strategic orientations (Zhou & Li, 2010) and network embeddedness (Zheng, Zhang, Wu & Du, 2011) were identified as important drivers of DC in firms from a variety of manufacturing industries.

Many authors also identified that DC are directly related to the organizational learning culture (Hung, Yang, Lien, McLean & Kuo, 2010) and embedded learning (Lee, Lin, Chen, & Shyr, 2011). With regard to the tourism sector, Nieves and Haller (2014) recently investigated the possible antecedents of DC in the hotel industry and empirically showed that prior knowledge and skills at the individual and collective level are the basis for developing DC. They also concluded that firms with qualified employees are

more likely to perceive the need for change and respond to it by reconfiguring the resource base.

Furthermore, many scholars have disaggregated the concept of DC. Ethiraj et al. (2005) found that client-specific capabilities and project management capabilities are fundamental for global firms in the software industry. Recently, Feiler & Teece (2014) provided arguments on how DC are developed, and described ten DC demonstrating that they do not simply emerge or represent what firms do well. They are rather identified and built through the effort of leaders and managers to configure, orchestrate, and sustain activities to gain and maintain competitive advantage in rapidly changing and highly complex business environments.

To conclude, it is important to highlight that DC are context-specific and therefore, they should be conceptualized and empirically tested considering specific characteristics of each sector. Moreover, it is important to analyze the role of entrepreneurs and managers in the development of DC, considering their qualifications, prior experience, and managerial skills.

Dynamic capabilities and the phases of strategy development and execution

For analytical purposes, Teece (2007) suggested that dynamic capabilities may be disaggregated into three capacities: (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and reconfiguring assets (Teece, 2007). The author also describes the nature of dynamic capabilities, highlighting the microfoundations underlying the three DC. Microfoundations involve skills, processes, procedures, organizational structures, rules, etc.

Capability to sense opportunities

This capability involves activities such as scanning, creating, learning, and interpreting. Teece (2007: 1322) states that "when opportunities are first glimpsed, entrepreneurs and managers must figure out how to interpret new events, which technologies to pursue, and which market segments to target". To achieve that, firms need to generate information and make it flow along the entire organization to enable people to make sense of it. If firms do not engage in these activities, they fail may miss important market opportunities (Teece, 2007).

Besides, the ability to recognize opportunities depends on the individuals´ capabilities and knowledge and on the organizational knowledge and learning skills, in general. Furthermore, the ability to get information from professional and social contacts and to understand that information

are fundamental to deal with the evolution of technologies, to anticipate customer needs, and to face market changes in general. All these tasks involve scanning and monitoring internal and external factors; learning; interpretation, and creative activity from managers.

Capability to seize opportunities

Firm growth includes not only identifying technological and market opportunities but also seizing them: once opportunities are identified, they are supposed to turn into new products, processes or services. To achieve this, firms need to maintain and improve technological competences and resources and make necessary investment (Teece, 2007).

Consequently, in order to achieve superior performance, firms formulate an overall strategy to make decisions regarding critical issues, such as when, where, in what, and how much to invest. Besides, firms select or create a particular business model to define commercial and financial priorities (Teece, 2007). "Deciding how to capture value helps define the architecture and design of the business model" (Teece, 2007, p. 1330). In general, critical decisions are related to technological aspects, target market, funding, and other strategic issues.

Additionally, the design of a business strategy requires creativity, information, and skills to integrate know-how from the outside (from other organizations) and from inside the firm (Teece, 2007). Different perspectives from the outside may help firms to identify new opportunities and to create competitive advantages. On the contrary, firms may identify opportunities but are not able to seize them successfully.

Capability to manage threats and orchestrate resources

A key ability to gain long-term competitive advantages involves recombining and reconfiguring resources and organizational structures in order to face market and technological change. Teece claims that individuals are likely to create opportunities based on knowledge, creative activities, and the ability to understand customers 'needs. Thus, apart from their experience, mangers need to develop managerial skills to lead the firm efficiently.

Teece also highlights the importance of integrating external and internal know-how, which is likely to be achieved by networking activities. Furthermore, within each firm, ¨the old¨ and ¨the new¨ must be complemented. Finally, firms require effective communicational and informational mechanisms to keep managers permanently informed.

The role of DC in firm growth

Firms´ growth is a central concern in the strategic management literature. Most investigations have focused on the identification of internal and external factors that influence growth. Particularly, Entrepreneurship scholars have made significant efforts to explain how and why firms originate, develop, survive, and grow (Schumpeter, 1934; Penrose, 1959; Gartner, 1985; Davidsson, 2004; Zhara et. al., 2006; Dutta & Thornhill, 2008; Stenholm & Toivonen, 2009).

Although academics have adopted different explanatory approaches to address the question of why some firms perform better than others, many of them have offered evidence of the importance of DC for firms' growth. In fact, the literature is now unanimous in considering that the theoretical framework of DC explains how firms adjust their resources and activities to achieve and maintain sustainable competitive advantages (Ambrosini & Bowman, 2009; Augier & Teece, 2008; Cavusgil, Seggie, & Talai, 2007). Competitive advantages are firms´ attributes that allow them to outperform the competition. Thus, studying how firms compete and survive in the external environment is essential to understand the internal processes that take place within each firm.

Different theories explain the sources of competitive advantages. Most of this research has focused either on firms´ opportunities and threats (Porter, 1980, 1985), firms' weaknesses and strengths (Hofer & Schendel, 1978; Penrose, 1959; Stinchcombe, 1965). In particular, Teece proposes the theoretical framework of DC and claims these are high level capabilities that allow firms to recombine and reconfigure resources and organizational structures to remain flexible and face change (Teece et. al, 1997). Furthermore, DC help to avoid that critical organizational practices become excessively rigid. Thus, given that the present study focuses on SMEs in which founders-entrepreneurs play a central role in the development of DC, Teece provides a wide framework to identify which managerial skills are essential to engage in the evolving process of growth in SMEs.

Context of the study

In this paper we focus on analyzing the dynamic capabilities related to business growth in small and medium enterprises in a developing country such as Argentina. The cases were selected considering two of the most dynamic sectors in the national economy, and specifically in the economy of the central region of Buenos Aires provinces. These two sectors are software and IT services, and tourism.

In Argentina, the Software and Information Services (SSI) has been expanding in both local and international markets, essentially based on entrepreneurial processes that exploit new technological opportunities, and the ability and creativity of their human resources. Indeed, human resources are the country's main competitive advantage in comparison with other economies. Recently, the Argentinean SSI industry has shown a significant growth according to international standard indicators, such as sales growth, employment and exports.

According to the annual report of the Chamber of Enterprises in the Software and Computer Services of Argentina (CESSI), between 2003 and 2013 the number of companies in this industry increased by 132%. In 2014, there were 4300 registered firms, of which 70% were small firms with up to fifty employees (CESSI, 2015). Moreover, with an annual birth rate of 20%, the SSI sector in Argentine has become the second most dynamic economic sector since 2003.

The main feature of this industry is the potential to add value and generate qualified employment. In particular, there is a continuous increase in the export of services, and there is a great demand for qualified human resources. This sector employs over 51,000 people and 50% of these jobs are concentrated in SMEs with less than 25 employees. The Argentinean SSI industry offers a wide range of products such as customized software; consulting; support services; implementation of applications; development of computer solutions; and products for business management and security tools. Recently, the development of the SSI industry has become a national strategic priority.

Furthermore, the growing economic importance of the SSI sector has led to the development of clusters. Although this sector is highly concentrated in Buenos Aires City, many other significant concentrations of technological and managerial capabilities are located in several cities of the country such as Rosario, Cordoba, Mendoza and Bariloche. At the same time, other smaller cities have been involved in different initiatives to develop the SSI sector. For example, Tandil, a city located in the center of Buenos Aires Province. In 2003, a Technological Center was established with a strong support from the local University (UNICEN), from where most of the computing engineers emerge. Thus, the city has become a very important provider of SSI services in the national industry.

Currently, Tandil hosts more than 100 SSI companies which have created more than 1500 jobs since its initiation. Previous studies (D´Annunzio et al., 2008) concluded that the local SSI sector operates in a very dynamic and competitive market. SSI firms face continuous changes both in technology and in the international market demands. Besides, this sector is largely composed

by startups or relatively young firms that operate locally and incorporate young people, mainly university graduates. Although there are some large firms, the SSI sector is mainly composed of small and medium enterprises.

In Argentina, the tourism sector has experience a strong growing tendency in terms of the flow of tourists and the level of employment. Thus, according to the National Ministry of Tourism, the arrival of non-resident tourists to Argentina grew between 2003 and 2013 from 2,995,272 to 7,543,975, representing a growth of about 86% of the touristic flow. Furthermore, in that same period accommodation rose by 40.5% and employment levels experienced an increase of about 25.2% from 882,125 in 2004 to 1,104,439 in 2013. According to the Argentinean Confederation of Medium-sized enterprises, the tourism activity accounts for about 8% of the GDP in Argentina. Besides, the tourism sector generates about 7, 3% of the total employment in the country. Considering all the participants within the tourism activity, SMEs are preponderant: currently, there are more than 200.000 companies operating in the tourism sector, 95% of which are micro, small, and medium-sized enterprises (CAME, 2013).

Thus, many cities around the country have developed a wide range of touristic activities and for many regional economies tourism is the main source of income. Tandil is a good example of that. Tandil is certainly recognized as one of the main touristic destinations in Buenos Aires Province and in the whole country as well. The tourism sector has experienced a sustained upward trend in terms of the flow of tourists and employment levels as well. Furthermore, Tandil is geographically located in the middle of the Province and its landscape is appropriate to develop the tourist activity. Indeed, the hills and natural environment made Tandil an incomparable place in Argentina. This city has capacity to host about 5660 visitors, 25% of which is provided by cottage resorts, as the ones considered in this study, according the classification proposed by the local government (hotels and cottage resorts have different treatments).

Research methods

Most studies on DC are conceptual and there is little empirical research on DC in SMEs. The main reason for this is the difficulty of operationalizing the concept of DC (Ambrosini & Bowman, 2009; Teece, 2012). Thus, it is important to increase the number of empirical studies on DC and to apply qualitative methodologies in order to provide detailed descriptions of all the processes involved in the development of DC (Danneels, 2011; Teece, 2012).

In the present study we analyze different business cases in order to better understand the origins of DC. Particularly, we apply an exploratory

strategy orientated towards the identification of the factors that influence the development of DC, the difficulties encountered in the process, and the role of entrepreneurs in the firms' performances. Based on this, the research was designed according to the multiple cases methodology, which was originally proposed by Yin (1989), and according to the process of inducing theory described by Eisenhardt (1989). This methodology is useful to obtain a detailed evaluation of each case individually (Bryman & Bell, 2007) and to better understand a phenomenon within its specific setting (Saunders et al, 2009). Additionally, Backman (1998) highlights that qualitative research strategies focus on individuals and how they interpret their reality based on their background. In this case, this is important to understand the whole process of DC and provide a convincing interpretation of facts.

This analysis includes eight firms from Tandil, a centrally located city in Buenos Aires Province (Argentine). In order to provide significant results (Patton, 1990) all the cases were selected from representative sectors in the regional economy: four cases from the software industry and four from the tourism sector. To select the cases, we considered certain criteria. Firms should be located in Tandil, Buenos Aires, a city that hosts one of the most important IT Centers in the country (Argentine) and it is a popular destination for tourists from around the country throughout the year. Besides, firms should be classified as young SMEs, according to the age and the number of employees and/or turnover. Lastly, firms should have been operating for at least three years, so that the development of dynamic capabilities could be studied as a process over time.

Based on these criteria and considering information from the researchers and from various entrepreneurial networks located in the city, eight companies were selected. Then, we contacted the owners of the firms to start the research process. Data was obtained through qualitative research techniques, including direct observation conducted by two members of the research group, and personal in-depth interviews conducted between August, 2013 and April, 2014. We also gathered information from different websites.

As Saunders et al. suggest, in exploratory research it is important to interview key informants (Saunders et al., 2009). In this case, we decided to contact the founders or the general managers of each firm. Depending on the firm, we interviewed the only founder or one or more of the founding team. All the interviews were held in the respondents' natural setting. Because of the exploratory purpose of this study, the perspectives and the interpretations provided in the stories told by the entrepreneurs were the main source of information.

To collect all the necessary information and to address every important aspect of DC, a guiding list of key questions and specific issues was prepared according to the theoretical framework. At the same time, we fostered interviewees to express openly to make the conversations more interesting and dynamic. The questions were mainly orientated towards defining the concept DC in SMEs; identifying the main DC to compete and position in the market; describing the main internal and external factors influencing the evolution of the firms; and determining the main managerial processes involved in the development of DC. Furthermore, to perform a detailed analysis, we asked each interviewee whether the conversations could be recorded or not.

At the beginning of each interview we asked the respondents to describe the main strategic actions taken in relation to the identification and assessment of business opportunities. This question encouraged the entrepreneurs to lead the conversation and tell their story in as much detail as possible. However, we involved in the conversation to ask additional questions and remind the respondents about the importance to fully address concepts, actions and interpretations. Due to this flexibility, we were able to organize and adapt questions if needed (Jovchelovitch & Bauer, 2000; Andersen, 2002).

Backman (1998) argues that one of the most difficult steps in qualitative research is the analysis of data. This is because case studies involve a big amount of subjectivity and opinion, and the vast majority of the results derive from personal interpretations rather than from statistical models such as in quantitative research.

In order to perform a careful analysis, all the interviews were recorded for later transcription. Then, all that information was integrated in a single document. The analysis involved an iterative process of interpreting and encoding data based on the researchers´ individual perspectives and the theoretical framework applied in the study (Creswell, 2007); comparing interpretations; and discussing categorical concepts.

First, all the transcripts were analyzed separately in order to identify and classify the emerging categories in relation to the following aspects: Customers and Markets, Product and Services; Business Model; Key Resources, and Capabilities and Main Focus. For each of these items we then identified significant events or changes and determined "phases" or different stages in relation to the growth path of each company. This analysis is briefly presented in Tables 1 to 8.

Second, we conducted a comparative analysis across cases, based on Teece´s framework of DC and its microfoundations. To organize results we assigned qualitative values to identify the differences between the cases in

relation to the growth path and the DC appropriately developed. To assess growth we considered two categories: gradual and accelerated growth, depending on the speed with which the company has been adding new staff over time. To assess the intensity of each DC, we applied a qualitative scale ranging from VERY WEAK to VERY STRONG. Additionally, we identified the key factors involved in the development of DC. Based on this analysis, we were able to compare and contrast the same phenomenon between the different cases and reach more precise conclusions in relation to both economic sectors. Tables 9 and 10 show the analysis described above.

Empirical analysis

In this section, we present a brief analysis of each case. First, we describe the firm and then show a table summarizing the firms´ growth path. The table shows results with regard to customers and markets, products and services; business models; resources; capabilities, and main focus and it is divided into phases, according to significant events or changes that were identified as key factors in the evolution of the firms.

Firm A

A is a software consulting and development company that was founded in 2006 by two young Systems Engineers. Their company designs, implements and optimizes technological solutions and applications, and specializes in offshore software development, product testing and design, and database management. The main customers are located in the United States, Chile, Spain, Brazil, and Germany, and the minority is from Argentina. The firm started providing services with only two employees and now it has a staff of thirty people, including systems engineers and software designers. Table 1 summarizes the main aspects that explain the evolution of *A*, identifying specific capabilities associated to the growth of the firm.

In this case it was possible to identify four distinct stages in the company´s growth path. Each stage is associated with milestones in the commercial expansion. The first stage included the beginning of the company, which was completely dependent on a single client from Chile.

In the second stage FIRM A attracted new customers, though through business intermediaries. By that moment, the Chilean customer had merged and started pushing FIRM A to become their exclusive development. However, an important US client encouraged FIRM A to remain an independent company.

Table 1. Capabilities related to the growth of Firm A

	Phase I: 2006 - 2007	**Phase II: 2007 – 2009**	**Phase III: 2009-2011**	**Phase IV: 2011 - present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	One single customer from Chile	Customers from the US and Germany contacted through entrepreneurs 'networking activities	First client contacted through direct commercial relations with the company in Germany	Positioning in the market of US startups. Beginning of the process of internationalization of the company
WHAT? Products and services How has the supply changed over time?	Software development and maintenance for a single client	Software development for an enlarged customer base in different countries	Software development for an enlarged customer base in different countries	Text search technologies for Oracle. Database Management and Testing. Software for mobile applications
HOW? Business model How has the business model changed over time?	The business was focused on programming	Software development Diversified target markets	Software development Diversified target markets	Specialization in specific technologies Positioning in the main worldwide startups market (USA)
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Technical training and experience of entrepreneurs in large established technology companies	Entrepreneurs ´networks with personal and professional contacts Ability to seize identified opportunities	Creativity in business management to attract customers and training of entrepreneurs in business management (MBA)	Access to venture capital to foster growth. Business orientation. Development of innovative products. Ability to reconfigure the business model.
FOCUS What was the main concern in each phase?	Identification of business opportunities other than the Chilean client to enable both independence and survival of the company	Development of competitive advantages based on high quality standards of services to face the difficulty in maintaining cost advantages after the exchange rate devaluation	Effective and efficient management of ongoing projects and the attraction and retention of talent	Business model reconfiguration orientated towards the specialization in specific technologies. Access to the American software market.

The third step in the growth process was taken when the entrepreneurs attracted their first customer through their own commercial strategies. This is important because the interviewees repeatedly emphasized how challenging it was to manage commercial relationships.

Since 2011, the entrepreneurs have defined new challenges and the firm entered a new phase, which aims at the specialization in no-massive technologies that require longer learning processes, and to the expansion towards a key target market: US. To this end, the entrepreneurs have decided to seek for short-term investors and to temporally settle in the US for networking. Thus, the company has been working on developing products for free text search; providing database management; testing services; and developing mobile technology. Particularly, the firm has focused on large volumes of information in real time (Big Data).

All these strategic changes also implied changes in the structure and management of the projects. At the beginning, the entrepreneurs had a complete lack of business experience and limited resources and their growth expectations were not ambitious. As they started working and gaining experience, particularly on business management, they increased their ambitions to grow. At the same time, their problems and drawbacks have also changed from one stage to the other. Initially, although it was relatively easy to find qualified human resources in the local market, entrepreneurs were concerned about finding customers and entering new markets. Under these circumstances, the entrepreneurs felt a low risk perception. However, after many changes in the firm´s and market´s conditions, they increased the risk perception and focus on two specific issues: project management and human resource management.

During the last years the firm has identified a key problem to grow: the difficulty in finding qualified and committed human resources. Furthermore, a common problem that most IT firms face is that they involve in temporary projects but they need to hire permanent human resources and retain them. Thus, skills for human resource management are a key factor of success in this kind of companies.

Firm B

B Argentina began operating in 2004 as a Research and Development Center of Internet Solutions for a Spanish technology group in the ICT sector. This group was founded in 1995 and currently it has a staff of more than 240 people working in Girona, Barcelona, Madrid, Buenos Aires, and Silicon Valley. The Spanish group consists of different companies that provide email security solutions, online business consulting, information technologies,

software development, and incubation of innovative technology solutions. *B Argentina* started providing services with two employees in 2004. Then, in 2010 the firm consisted of almost seventy employees and currently it has thirty-eight employees.

Table 2. Capabilities related to the growth of Firm B

	Phase I: 2004- 2007	**Phase II: 2007-2011**	**Phase III: 2011 – present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Developments made exclusively for the Spanish headquarter.	Marketing of software developments to other companies belonging to the Spanish group.	Developments are extended to companies belonging to the Spanish group and also to spin off arising from business incubation within the group.
WHAT? Products and services How has the supply changed over time?	Provision of Consulting Services and Software Maintenance	Software Consulting and Development of innovative products.	Software Consulting. Innovative product development and incubation of projects and generation of new startups
HOW? Business model How has the business model changed over time?	Software Development Center for the Spanish headquarter	Software Development Center for companies associated with the Spanish group	Software Development Center for the Spanish headquarters and other companies associated to the group. Incubation of projects and generation of new startups
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Technical training and entrepreneurs' experience. Networking with international contacts. Exploitation of opportunities.	Ability to innovate and develop new products. Linkages and co-working with research centers at the university.	Know-how in project management, development of startups, and product innovations.
FOCUS What was the main concern in each phase?	To reach a high quality standard of services and processes	Consolidation of working teams with experience in developing products for the international market	Firm growth in a market where the firm is less competitive than it was at the beginning.

The growth of firm B has always depended on the evolution and growth of the Spanish group to which it belongs. It is also influenced by the creation of new businesses within the group, and the generation of international networks through the companies´ CEOs´ mobility. The firm´s business model limited its opportunity to formulate its own strategy and grow individually. All this had a significant impact on B´s possibility to develop and enhance essential

capabilities. As a consequence, the main weakness the entrepreneurs have showed is the difficulty in attracting their own customers.

Considering these conditions, three stages were identified in the growth path of the company. During the first stage all the software developments were made for the Spanish headquarter exclusively. In the second stage, the expansion of the parent company resulted in the expansion of B´s development activities for other business units within the group. The third stage of B´s evolution is related to the provision of services to many of the company´s spinoffs.

At the beginning, the entrepreneurs were concerned about the quality of their products and processes. Thus, they invested and worked heavily in training to be able to certificate quality according to the standards of the ISO 9001 (International Organization for Standardization). Later, their main concern was the change in the business model: the firm started working for small projects requested by the parent company and then became a business incubator. Additionally, during the process, B gained a key competitive advantage: the know-how of developing and managing projects for startups, adding value not only in the development stage but also in the generation of product innovations.

Firm C

C is a company that develops agile software located in the United States and South America. The firm was founded in 2006 by two entrepreneurs and later another partner joined to the founding team. *C* develops near shore software and has a wide customer base. The firm provides high performance agile products that provide and customer services. The main supply of *C* includes consulting technology, Entertainment Digital Media, Cloud Computing, Java and Net, Software Architecture, Agile Software Development, Amazon Web Services and Project Management, among others.

The firm started operating with a group of 11 people and currently they are about 80 people and continuing to expand. Their most recent wave of growth is onshore in the United States and they are bringing up development teams and managers to work onsite with their clients, acting as a bridge to their delivery centers in South America.

C´s path growth is divided into three stages depending on the business models developed along its evolution (Table 3). The company started operating at the middle of 2006 when the entrepreneurs identified that the media industry was changing towards digitization and automation. They decided to create a tool to process multimedia content and digital information automatically. The product was mainly offered to major television and cinema

studios. Initially, the business was self-financed with resources from ¨the three Fs¨ (family, friends and fools) but then the entrepreneurs gained access to a venture round of 1 million dollars. In that occasion, they had the opportunity to present the product to be evaluated by the owners of important business such as Disney, New Brothers, American Idol, Fox, and Sony.

Table 3. Capabilities related to the growth of Firm C

	Phase 1: 2006 – 2011	**Phase II: 2011-2012**	**Phase III: 2012- present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Major companies in the movie and television industries, such as Sony and Disney	Large established firms in the international market.	Large established firms in the international market (Accenture, Coca Cola, All digital, Deluxe, Discovery Communications)
WHAT? Products and services How has the supply changed over time?	Digital tool for automatic processing of digital information	Cloud computing technologies	Technology consulting of Digital Media and Entertainment, Cloud Computing, Java and .Net, Software Architecture, Agile Software Development, Amazon Web Services and Project Management.
HOW? Business model How has the business model changed over time?	Postproduction distribution to movie studios, television broadcasts, and advertising agencies	Supply of integrated technology services	Software development near shore and specialization in high quality services.
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Entrepreneurs 'technical training and experience. Networking	Active learning generated from previous experience operating in the US market. Ability to reconfigure the business model.	Sound knowledge of the market ecosystem where the service is provided. Organizational culture International Networks
FOCUS What was the main concern in each phase?	The media industry was moving towards digitization and automation. To find a product that will generate attraction to large customers	Strengthen sales rates Redefine business	Growing shortage of qualified staff. The company gets involved in this situation and decide to train human resources in-company

However the evolution of the business was slower than expected and the entrepreneurs were not able to make it a profitable organization. Thus, they took a new step and sold the intellectual property to a US company. Then, the firm redefined the business model and started providing services for large established firms in the international market. During the first stage of this project, they focus on learning and formulating a viable strategy. Then, they took another step and expanded their services and consequently their capabilities. Currently, the firm is running a new business model based on a wide range of high quality services for large established firms in the international market such as Accenture, Coca Cola, All digital, Deluxe, Discovery Communications.

Firm D

D provides services for people who decide to get rid of things they do not longer want or use at their homes or workplaces and are determined to sell them. The firm´s services include all the activities related to the different stages in the sales process. Users should only send a message describing the product. After that, *D* is in charge of picking the product to then advertise it online. Once the sale is agreed, *D* is in charge of the products ´ packaging and distribution. Currently, this service is operating in San Francisco (California) and Austin (Texas). *D* works with leading investors within the industry, such as Techstars Ventures, MasterCard, Silicon Valley Bank, Cygnus Capital, NXTP Labs, Grooveshark´s cofounder, Andres Barreto, and Uber´s CTO and co-founder, Oscar Salazar.

At the beginning there were only two founder entrepreneurs and currently they are a group of sixteen people.

This startup was born in Austin, while the founder entrepreneurs were participating in a startup accelerator and development program at Techstars to present a project called Productgram, which was successfully accepted (Table 4). Then, the entrepreneurs spent a month analyzing the US market, along with professional advisors and mentors, and identified a surprising fact: each home kept about three thousand dollars in unused objects. They also found that those objects were not posted at traditional marketplaces such as eBay or Craigslist because of all the problems that consumers faced when trying to sell them. Selling those products not only includes listing the products online, but other activities such as pricing, packing, labeling, sending the package through UPS or Fedex, and charging.

Table 4. Capabilities related to the growth of Firm D

	Phase I: 2012-2014	**Phase II: 2014-present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Contacts from Austin, US, generated through social networks and social circles	Public in general. Consumers from Austin and San Francisco, US.
WHAT? Products and services How has the supply changed over time?	Application to sell different products through social networks and e-commerce platforms. (¨Instagram for products¨).	App to sell useless devices and objects Value maximization Dealing with all the stages along the sales process.
HOW? Business model How has the business model changed over time?	Marketplace model: the company is responsible for marketing activities.	Service layer model Focus on critical logistics issues.
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Entrepreneurial team Participation in Business Accelerator programs: NXTP Labs and Techstars. Funding from a mutual fund, Signus VC, and from Andrés Barreto, Grooveshark´s founder.	Enlarged working the team and development of partnerships with American companies that have innovative logistics capabilities. Active business development activities
FOCUS What was the main concern in each phase?	Develop, refine and test the business idea. Attract funding	Adequate fit between the products 'supply and demand to grow in the American market.

Based on this opportunity, the entrepreneurs decided to refocus their business idea and created D in 2012. D is a service layer above traditional marketplaces that provides all the mentioned services. The new project involved intense logistics activities that led the founding team to expand and develop partnerships with logistic leading American companies. The new venture also involved the development of new skills and managerial activities.

Due to the short age of this firm only two stages were identified. The first period is related to the beginning of the project. Then, they took an important step and expanded their services to new locations. In this second stage the entrepreneurs enlarged the working team and develop critical skills in logistics management.

Firm E

E is a cottage resort that provides adventure activities and nature sports. The firm has been operating for 25 years (Table 5). At the beginning, the entrepreneurs were the only people in charge of all the entrepreneurial and operational tasks and activities. Currently *E* has a staff of 40 people. The company also offers educational camp services, outdoor training, and outdoor experiential training. The majority of the customers are from private schools and companies, NGOs, and other public and private organizations. Most of the clients are from Buenos Aires city. During the first stages, *E* faced a strong seasonality in sales, exclusively concentrated in the period between September and December. Nowadays, the firm has achieved a more steady demand, providing different services throughout the year.

Table 5. Capabilities related to the growth of Firm E

	Phase I: 1989-1993	**Phase II: 1993-2002**	**Phase III: 2002-present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Local organizations Sporadic and seasonal demand	Private schools from Buenos Aires Seasonal demand	Schools, organizations, and companies Demand throughout the year
WHAT? Products and services How has the supply changed over time?	Tours and excursions	Educational Camp services	Educational Camp services, outdoor training and summer camps
HOW? Business model How has the business model changed over time?	Independent services. Not based on horizontal or vertical integration. Own design and plan of the firm´s value chain.	Customer loyalty	Business model based on technical and commercial synergies. Development of new business units
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Natural context and favorable environment to develop the activities	Commercial and marketing management. Infrastructure development	Strategic management New products and services development
FOCUS What was the main concern in each phase?	Design attractive products Attract new customers	Reach a more steady demand Reduce fixed costs.	Business professionalization HR management Training for future firm members from the own family

The key features of E´s evolution are the high level of investment in infrastructure and the emphasis on building capabilities related to innovation in services and processes. During the first stage, the firm provided daily excursion services to different target customers. The services included food and lodging.

As their services attracted new clients, the entrepreneurs decided to invest in infrastructure (dining, accommodation, etc.) and took a step forward. They also designed a new business strategy based on close relationships with customers and high-quality services. The entrepreneurs focused on designing customized services, which allowed them to gain access to a new target customer: schools. Although challenging, this experience was a key factor in the evolution of the firm given that providing high quality services to that specific target, led to an intense process of learning within the whole firm.

The entrepreneurs´ decision to certificate quality and implement the process according to the ISO 9001, implied a new leap in the growth trajectory of the company. They continued to innovate and decided to undertake a diversification strategy creating new services (especially outdoor training) for new target markets (companies). Nowadays, the firm is still one of the main touristic attractions in the city in spite of the emergence of new competitors.

Firm F

F is a cottage resort that comprises an urban area of 30,000 m^2. Currently, the infrastructure includes a reception area, a spa, a restaurant, an indoor pool, an outdoor pool, and 18 cottages suited for 2, 4, 6 and 8 people. The firm started operating in 1997 and currently it has 13 employees (Table 6).

The growth path of this firm is associated with the different services that were added in response to the increase in the number of competitors. F was one of the first cottage resorts to be established in the city. At the beginning, competence was low. However, as the tourism sector gained importance in the local and national market, F`s entrepreneurs were forced to improve their original offerings in order not to lose customers.

Firm F started operating in 1997 with a single cottage. The following year four more cottages were built. In this first phase, accommodation was the only service provided. Then, the entrepreneurs decided to increase the number of cottages and built a craft shop and a restaurant. This second stage was the longest period with only a few improvements in services. One of the reasons for this was the financial crisis of 2001-2002. Given the difficulty to invest in new cottages and facilities, the entrepreneurs focused on attracting new customers and inspiring loyalty from their regular customers.

Table 6. Capabilities related to the growth of Firm F

	Phase I: 1997-2000	**Phase II: 2000-2010**	**Phase III: 2010-2013**	**Phase IV: 2013 - present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Middle-class customers mainly from Buenos Aires	High and middle-class customers mainly from Buenos Aires	High and middle-class customers mainly couples from Buenos Aires	High and middle-class customers mainly couples from Buenos Aires, La Plata, Mar del Plata and other cities of the province.
WHAT? Products and services How has the supply changed over time?	Cottages for 2 and 4 people	Cottages, a craft shop and a restaurant	Cottages, suites, restaurant, spa, multipurpose room	Cottages, suites, restaurant, spa, multipurpose room
HOW? Business model How has the business model changed over time?	Independent touristic services. Not based on horizontal or vertical integration. Own design and plan of the firm´s value chain.		The owners rent the business to a private firm that is in charge of the operational activities. The owners keep the ownership and develop managerial activities.	Independent touristic services. Not based on horizontal or vertical integration. Own design and plan of the firm´s value chain.
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Financial resources Commercial management	Financial resources Capability to be innovative Institutional articulation	Commercial management Networking	Capability to be innovative
FOCUS What was the main concern in each phase?	Positioning in the tourism market. Local development in the tourism sector. Competition	Products innovation	Lack of personal motivation and interest in continuing the business	Deciding and planning the future and continuity of the firm

After this period, a third phase started with the building of ¨suites¨ cottages. This qualitative innovation meant a breakthrough for the company over its local and national competitors. Besides, a spa, a new reception area, and a multipurpose room aim at hosting institutional and private events were built. Despite all these improvements, the entrepreneurs went through a difficult time during this phase. They had lost the initial motivation and

thought of selling or renting the cottage resort. Finally, they rented it to a private firm for a three-year period.

The forth phase began when the entrepreneurs decided to be in charge of the resort again. However, they had formulated a new strategy and a new business model in order to ¨enjoy¨ their business and not to lose motivation.

Firm G

G is a cottage resort that offers accommodation and recreation for tourists. The company started operating in 2003 with only one cottage and currently has six cottages suited for 25 people (Table 7). Although this firmed originally emerged as part of the entrepreneur's lifestyle, he has turned it into a real business and has identified many opportunities to grow. In particular, the entrepreneur has adapted the business model to diversify the target market, for example, providing rental services of the restaurant and catering facilities for private events.

This firm started operating without any employee, only the founder entrepreneur. Once the firm had regular activity, employees were incorporated, depending on the work load. Considering the seasonally characteristic of the tourism sector, the entrepreneur could not afford to hire all the employees permanently. Thus, the number of employees has changed according to the customers´ needs. Currently, the firm has six employees.

The evolution of this firm may be divided into three phases. The first period involved building all the cottages and providing services with the maximum available capacity. Then, an internal financial crisis inhibited innovations and the entrepreneur was not able to build any new cottage. The financial issues have always been the biggest difficulties in running the business. The entrepreneur has faced many problems to access funding and to manage the pressure of tax obligations. These conditions make the business no longer profitable.

However, the founder never gave up and continued working to improve services while trying to reduce fixed costs. Indeed, the last phase started when the firm started a recovery process. The entrepreneur had designed a different strategic to make it a profitable business. Thus, he cancelled the restaurant service and decided to use that place as a multipurpose room for private events. This decision is not directly related to the visitors´ demands but the entrepreneur found a new business opportunity and made the effort to seize it.

Table 7. Capabilities related to the growth of Firm G

	Phase I: 2003-2005	**Phase II: 2005-2011**	**Phase III: 2011 - present**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Moderate level of occupation Middle and high-class customers mainly from Buenos Aires	Higher level of occupation Same type of customers, although varying according to the seasons.	Almost same level of demand Types of customers do not suffer major changes because the city remains being a relative high quality destination
WHAT? Products and services How has the supply changed over time?	Cottages for couples and families of up to six members.	Cottages and restaurant services	Cottages and multipurpose room. Restaurant services are cancelled.
HOW? Business model How has the business model changed over time?	The Enterprise was originally thought as a lifestyle. Lack of planning and design activities. Available means	Professionalization of services Implementation of a management software system Professional advice Regular staff training programs	Complementary services and activities are planned to add value to the extant services
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Financial resources to star operating	Employees and services professionalization Innovative capacity Institutional coordination	Ability to restructure the business model to face a major financial crisis, without reducing the level of services provided
FOCUS What was the main concern in each phase?	Positioning in the market	Innovation in products, processes, and management	Sustain profitability rates Services diversification and innovation Positioning in a more mature market

Firm H

H is a cottage resort that began operating in 1998 (Table 8). The entrepreneurs started working on their own with only one cottage and now the firm has 10 cottages and 6 employees. The resort has accommodation for 42 people. Although the business may be considered a family business that was originally created as part of the entrepreneurs' lifestyle, nowadays they have a business vision and seek grow opportunities and high profitability.

Table 8. Capabilities related to the growth of Firm H

	Step I: 1998-2001	**Step II: 2001-2004**	**Step III: 2004-2010**	**Step IV: 2010-2015**
TO WHOM? Customers and Markets How customers and the target market have changed over time?	Low level of occupation Middle-class customers from Buenos Aires The city is not strongly positioned as a touristic destination. Seasonal demand	Higher level of occupation Same type of customers. Seasonal demand The city starts penetrating the tourism market after the national crisis in 2001.	Higher level of occupation Middle-class and upper class customers from Buenos Aires and other nearby cities. Seasonal demand	Same level of occupation. Demand increases in summer times and holidays. Demand becomes steadier.
WHAT? Products and services How has the supply changed over time?	One single cottage	Three cottages	Seven cottages, outdoor pool, and reception area.	Ten cottages Accommodation for 42 people. Breakfast and cleaning services. Outdoor pool Indoor pool Spa Playroom
HOW? Business model How has the business model changed over time?	The Enterprise was originally thought as a lifestyle. Business idea not clearly defined	Business idea not clearly defined. Financial and operational planning activities.	The business plan becomes more strategic-orientated. Focus on customer satisfaction.	Customer satisfaction. Customer loyalty High quality standards in services. Advertising in social networks such as Trip advisor and Facebook.
WITH WHAT? Key resources and capabilities What have been the key resources and capabilities at each stage?	Financial resources to start operating	Financial resources to improve the services supply Focus on developing qualified human resources	Funding from different investors	Financial resources Human resources. Staff training programs Innovative capacity Professionalization
FOCUS What was the main concern in each phase?	Market positioning.	Market positioning	Achieve greater accommodation capacity Increase incomes to invest in the business Product innovation	Achieve greater accommodation capacity Product innovation Human resources management

The firm´s growth involved a gradual process associated to the number of cottages and the services that were provided. Since the beginning, the entrepreneurs decided to incorporate one cottage per year approximately in order to improve services and be financially balanced. Besides, the entrepreneurs emphasized that providing high quality services is the key to survive in such a competitive market and that they have always focused on client satisfaction.

The first phase includes the beginning of the activity and the first access to customers. Then, we identified a new phase after the financial crisis of 2001, which influenced directly into the business. Due to the crisis, the entrepreneurs were forced to sell their home in order to get cash to cancel a loan. Besides, the crisis had a strong impact on the tourism activity in general. Fortunately, people that were not able to travel abroad, decided to travel to Tandil. Thus, Tandil became a touristic destination in demand.

After the crisis, in a third phase firm H incorporated new services. Specifically, the outdoor pool. In this period, the entrepreneurs focused on customers´ needs and become more strategic- orientated. Although the entrepreneurs considered their business as a lifestyle, they realized that they had to reformulate the strategy and plan their growth trajectory. This change implied the start of a new phase and during the last five years the firm has incorporated an indoor pool, a spa, and a playroom. Furthermore, three new cottages have been built. Currently, the entrepreneurs focus on providing high quality services instead of expanding the accommodation capacity.

Empirical cross case analysis

As mentioned above, we conducted a comparative analysis across cases, based on Teece´s framework of DC and its microfoundations. Besides, we compared growth paths across firms and economic sectors (Tables 9 and 10).

Table 9. Cross-case analysis for enterprise of software and informatics services

	Empirical Themes and Illustrative Data			
Core Concept	**Case A**	**Case B**	**Case C**	**Case D**
Growth Path	**Gradual**	**Gradual**	**Accelerated**	**Accelerated**
Sensing	**Moderate**	**Moderate**	**Strong**	**Very Strong**
Analytical Systems and individual capacities to learn and to sense, filter, shape and calibrate opportunities	Key factor: social and personal contacts and networking strategy "(…) individuals in the software industry are so connected….that the most successful commercial strategy is networking…no advertising is required.¨	Key factor: Initial identification of business opportunity in a crisis context Restricted capacity to operate because of the dependence on the headquarter "Nowadays we are trying to penetrate new markets, and more specifically, to sell to the US market… that is the only way to compete.¨	Key factor: Entrepreneurial orientation Entrepreneur´s personal and professional contacts Networking "(…) many people have specific local knowledge…. And solutions and decisions are likely to be biased…. My orientation has always been biased towards the US industry¨.	Key factor: Participation and intensive mentoring from business accelerators programs. Market Research "In the business accelerator program (Techstars) mentors attacked our business idea and business model based on solid arguments (…) so we started analyzing the American market…¨
Seizing	**Moderate**	**Moderate/Low**	**Strong**	**Strong**
Enterprise structures, procedures, designs and incentives for seizing opportunities	Key factor: Technological training and specialization "(...) For us, the most important difficulty is the commercial development of the business ... we have to be creative…Given that we had no training or experience in commercial activities, we decided to do the MBA .	Key factor: Joint growth of the business group from which the firm depends on. Difficulty in exploiting opportunities not included in the business group strategy that is formulated by the headquarters. ¨Here we develop products that are sold worldwide. Here we are in charge of the technical activities: the software development and technical support ...and there (Spain) they have specialized in commercial management and contact with customers around the world. (…)We have many significant limitations in making our own decisions regarding certain business issues… we are restricted…. Besides, we do not have direct contact with the market and we lack essential commercial skills	Key factor: Organizational culture and knowledge management ¨We differentiate from our competitors in how we do things. We have much less processes, documents, and traditional certifications. On the contrary, we encourage people and things to keep as closer as possible. We foster members to tell stories, to share spaces, ideas, and opinions. We want to share idiosyncrasy and build a real organizational culture…strategies are almost the same…. the key is interpersonal relationships	Key factor: Managerial skills and capabilities of Entrepreneurial team Strategic partnerships Managerial, financial, and operational support ¨You can always go to the market and validate your product or service, even before having the final product or service ready for distribution. You can talk to potential customers, partners, and stakeholders and verify the business 'feasibility at least at a minimum scale to then extrapolate the results. And that is what we did (...) We were forced to increase the working team and develop partnerships with American companies, which could provide us novel logistic skills. All this involved much more organizational activities. Our advisors and investors were central to achieve all this.

	Empirical Themes and Illustrative Data			
Managing threats and resource reconfiguration	**Moderate/Low**	**Moderate/Low**	**Strong**	**Moderate**
Continuous alignment and realignment of specific tangible and intangible assets	Key factor: Specialization in BIG DATA technology. Extensive learning processes. Expansion and positioning in the US market. "(...) It is extremely important for us to have an office in the US market. We are seeking for a specialization path to get out of the outsourced development service market, where anyone enters and competes without adding value. A kind of specialization which does not involve increasing the number of people to escalate and grow…because that is a clear limitation ...That would enable us to specialize in specific technologies that require extensive learning processes…and that does create a real barrier to market entry and competition¨.	Key factor: Adaptation to the headquarters 'conditions and limitations. It is unlikely for the firm to decide and formulate an independent strategy. "Today we prioritize quality rather than costs because the difference in costs between Argentina and Spain is almost nonexistence.... there may be difference between Spain and US, but that is not our case....However, at the beginning, selling high quality products and services in a country facing crisis was almost impossible…but today our company has 7 or 8 years of experience and it has developed many international successful projects¨.	Key factor: Experience- based learning ¨(…) we realized that the media industry was changing towards digitalization and automation....so we decided to focus on providing services to large media companies…but the evolution of the market was slower than we expected and we never managed to be a profitable organization. We failed to find the adequate scalable business model although we struggled to develop mechanisms to attract customers from the media industry....so we sold our intellectual property to a US company. After that, we reconfigured our resources and started a new company based on our previous experiences, knowledge, and training orientated towards high quality services¨	Key factor: Learning based on entrepreneurs 'own experience and others 'experience. Important changes in business model towards the integration between on-line sales and the customers 'experiences through off-line sales ¨We decided to change from a marketplace model focused on selling online, towards a more sustainable model based on service layer…which is superior because it involves significant logistic challenges and also considers the off-line experiences of customers¨.

Table 10. Cross-case analysis for enterprise of turism

	Empirical Themes and Illustrative Data			
Core Concept	Case E	Case F	Case G	Case H
Growth Path (Gradual vs. Accelerated)	Gradual	Gradual	Gradual	Gradual
Sensing	Moderate	Moderate	Moderate/Low	Moderate/Low
Analytical Systems and individual capacities to learn and to sense, filter, shape and calibrate opportunities	Key factor: Information for identifying opportunities from customer surveys. Social and professional circles Relationship with suppliers Permanent staff training "When we started providing this all-inclusive kind of service in our camps, including accommodation, food, and outdoor activities, there was no other place to offer the same services. And as time went by, we were able to identify new business opportunities. And since a couple of years ago our main target segment started comprising high performance sports teams and large companies, demanding both our traditional recreational activities and new professionalized services¨.	Key factor: Deep knowledge about the tourism industry and customers´ needs. Entrepreneurial orientation Active participation in local and regional institutional networks directly linked to tourism activities. "I believe that identifying opportunities has to do with my personality… but of course my education and training are important too, clearly. (…), And the most important thing is to keep permanent contact with customers. (…) Regarding my connection with institutions within the tourism industry, I have actively participated in both local and national institutions. Networking is a must¨.	Key factor: Direct contact with customers. Active participation in local and regional institutional networks directly linked to tourism activities ¨Opportunities always arise from direct contact and communications with customers, which can be formally or informally established… we make surveys.¨ ¨ (...) you have to participate because that way you can generate professional and commercial links, and even friendship, with your own competitors…and many times informal meetings are good to generate interesting debates and exchange different point of views and share experiences… and new ideas are likely to emerge.. And we help each other…that is what cooperation means¨.	Key factor: Direct contact with customers. Active participation in local and regional institutional networks directly linked to tourism activities "(...) Our firm has experienced gradual growth…being here all the time, and living in the same place that our customers, they enjoy talking and expressing their opinion about how they feel, what they expected, and what things would be positive to change..... And that allows us to enhance our services and grow. We are very aware of how customers feel and they appreciate that too. "
Seizing	Strong	Moderate	Moderate/Low	Moderate/Low
Enterprise structures, procedures, designs and incentives for seizing opportunities	Key factor: Availability of financial resources. Professional structure ISO quality certification including all the organizational processes, from service design to marketing strategies. Permanent evaluation from customers "We keep training all the time... we attend external or in-house	Key factor: Availability of financial resources to make all the necessary investments. Design of a platform to provide superior quality services. "We are risk averse so we dedicate too much time to think about everything very carefully... we do lot	Key factor: Limited not professional organizational structure Scarce financial resources ¨At the beginning there was only one employee and then we hired more staff as it was necessary depending on the demand, which is extremely seasonal. Currently, there are six part-time employees…	Key factor: Availability of financial resources Staff training Communication "(...) regarding funding, we have obtained many bank credits that enable us to make investments and improve our supply (...) We also received money from private investors and that boosted the business¨.

	programs." (…) certifying was not as difficult as many people believe. We already had many control and standard processes and the organizational culture was prepared for those changes… we only needed to adapt the way of doing certain things. Ours was the first company in South America to achieve that certification.	of planning. Indeed, although we spend almost every day together, we dedicate time to debate and create a specific environment to talk business."	but although we are few people we still keep things organized and so there is a Director, an executive assistant, and a management team. Besides, operational activities are also divided into cleaning, cooking, and maintenance.¨ (…) there are lots of things to do to improve our services... but the problem is to maintain profitability when costs are constantly increasing¨.	(…) Human resources and social capital are central in this kind of activities. We regularly invest in staff training programs. (…) and we have general meetings for the whole staff at least every one month. Communication is an essential resource.¨
Managing threats and resource reconfiguration	Moderate	Moderate	Low	Moderate/Low
Continuous alignment and realignment of specific tangible and intangible assets	Key factor: Diversification in the services supply Professionalization Development of programs of social and environmental responsibility ¨We have always tried to improve existing services and add new ones to face our customers' needs…. providing services for companies is a good example for that¨. "In 2007 we started working with Corporate Social Responsibility (CSR)…we already had that kind of organizational practices because from the beginning of the business we focused on being responsible for the environment and natural resources.¨	Key factor: Diversification in the services supply "Given the recent increase in the number of competitors in the tourism industry, we decided to orientate our strategy towards innovation and differentiation…and I think the most effective mean of differentiation consist in getting increasingly involved with the customers´ experiences and then segment the market according to what they need to enrich their experience in our resort. People do the same in almost every cottage resorts: they sleep, eat, and rest our challenge is to give them more than that¨.	Key factor: Diversification in the services supply ¨We have made many changes … for example, we cancelled the services from the restaurant that were no longer profitable and decided to rent the place to private events as a multipurpose room. Now we have a new ¨business¨ with new customers and another source of income¨	Key factor: Diversification in the services supply "Competition is an important matter to the survival of the firm…there are many problems with the entry barriers in the local market….there are not any…too many new entrants that easily attract and absorb clients providing modern services, which are less likely to be provided by older companies.

Discussion

Overall, we identified some common results regarding DC across all the cases. However, firms engage in different types of growth trajectories and that influences the type of skills that firms decide to develop. Besides, there are different growth patterns related to specific industries and to specific firms. Furthermore, firms have different expectations related to growth depending on the stage of their life cycle. Strategic priorities also differ between firms.

In the present study we analyzed how growth paths differ between the sectors and how DC differ between SMEs within the same industry. Given that results were analyzed based on Teece´s theoretical model of DC (2007), we identified industry-specific and common factors involved in the development of DC. We also identified that although all the firms generated some DC to grow, they applied different mechanisms, as shown in Table 9 (Cross Case Analysis between firms in the Software sector) and Table 10 (Cross Case Analysis between firms in the Tourism Sector).

With regard to the capability to sense opportunities, this identification resulted to be closely linked to the entrepreneurs and, specifically, to their entrepreneurial orientation, personal and professional contacts, and networks. This is because market and industry information is the key to identify business opportunities and be competitive. Thus, entrepreneurs contact other participants to obtain this knowledge and understand the business ecosystem, and to gain experience in making strategic decisions. Additionally, in order to obtain market information, the majority of the entrepreneurs highlighted the importance of keeping close contact with customers (particularly in tourism firms) and networking.

At the individual level, based on Teece´s framework, we interpreted the role of entrepreneurs´ managerial skills, particularly, in younger companies, in which individual capabilities are extremely important. Indeed, at the startup stage, firms are based mainly on entrepreneurs 'skills. On the contrary, established companies mainly focus on organizational processes and routines and the ability of the management team. In relation to this, Teece concluded that the ability to recognize opportunities depends on the capabilities of individuals, and, specifically, on knowledge about customers' needs (Teece, 2007).

To conclude, other factors also influence the process of identifying opportunities, such as the changing conditions of the macroeconomic context in which companies operate, which requires flexibility, permanent reconfiguration of business strategies, and the search for new markets for firms to compete. This conditions lead entrepreneurs to develop entrepreneurial capabilities in terms of environmental monitoring and strategic planning given that they are asked to design alternative business models and strategies. Firms A and D are good examples of the reorientation of the business strategy.

The capability to seize opportunities varies depending on the activity and the growth path of each firm. Many entrepreneurs identified or sensed opportunities but failed to seize or exploit them, particularly in the SSI sector, because of the difficulty in identifying the needs of the target market. This is primarily attributed to the lack of strategic management skills. Unfortunately,

entrepreneurs do not realize about this problem until they face grow opportunities and realized they do not are prepared for that challenge (firms A and B).

Firms that experienced gradual growth identified managerial skills as fundamental factors and the entrepreneurs of SSI firms concluded that their main weaknesses were associated to the lack of managerial skills. On the contrary, firms with accelerated growth, focused on a specific factor: organizational culture and interpersonal relationships. Flexibility and knowledge management are considered competitive advantages in the SSI sector (firm C) as well as working teams and strategic alliances (firm D).

Firms in the tourism sector demonstrated to face different problems and to focus on the availability of financial resources and the certification of quality standards. These aspects are particularly relevant for tourism firms. Whenever entrepreneurs decided to expand their services and make investment decisions, they considered both the potential opportunities and the available resources. Therefore, this is a fundamental capability for tourism firms.

Business model is also relevant in this stage. The kind of business model may have a strong impact on the firm´s capacities. For example, firm B depends exclusively from a Spanish business group and that limits the action and motivation of the entrepreneurs. In many cases, the local firm had sensed opportunities to grow but was not able to make any decision and they lost them. So, it is important for the firms to remain alert and detect opportunities but also to transform customers' needs in new products or services (Teece, 2007). The decision-making process also influences the firm´s possibilities to seize business opportunities, as well as networking activities, that provide access to resources and capabilities and accelerate learning processes.

With regard to the capability to manage threats and orchestrate resources, firms that experienced gradual growth based their capabilities on technological specialization and learning; and the capacity to adapt to environmental conditions. Particularly, learning from past experience in the sector, that allows entrepreneurs to visualize market changes, is critical to the development of skills related to accelerated growth in SSI companies.

Teece (2007) argues that the key to sustain growth is the ability to recombine resources and organizational structures as the company grows and markets and technologies change. In this context, it is important not only to identify the objective conditions of the environment, but also the subjective perception of entrepreneurs. In this aspect, we identified certain common concerns regarding the development of the businesses.

In the SSI sector, the most important concern is linked to the progressive loss of competitiveness of local companies in international markets, derived

from the sustained increase in labor costs (which in this sector represent the largest item in their cost structure). Besides, the international financial crisis is pushing down wages (particularly in European countries). Thus, local firms are forced to re-orientate their strategies and resources towards technical and commercial specialization and higher differentiation to reach more profitable markets.

Furthermore, in the software industry, in particular, inflation is another important factor that further hinders the scenario for companies to sustain competitive advantages. Local firms have serious difficulties in transferring the increase in costs to final prices, which are internationally determined. Besides, firms compete do not compete for customers but for qualified human resources, which are scarce resource and therefore are strongly disputed by companies.

In the tourism industry, to face change and be competitive the key factors are the development of managerial skills orientated towards the diversification of the services provided and the formulation of innovative strategies to differentiate from competitors, such as social responsibility programs and environmental programs.

Additionally, the absorptive capacity is a critical tool for touristic firms to face new environmental conditions and reformulate their strategic orientations. Besides, firms improve efficiency and quality of their services applying mechanisms or agile methodologies to analyze, repeat and experiment tasks to improve performance in the shortest time possible, and to optimize response times and continually validate customers´ requirement through a more direct contact at different stages of the product development. This process of repetition and experimentation enables companies to generate necessary organizational learning.

Finally, we emphasize that the three types of DC should be analyzed together, because firms need all of them to grow. Based on our analysis, DC were developed in a context of significant openness to learning, and where experimentation and trial and error played a prominent role. The integration and reconfiguration of activities, resources, and skills did not involve a strategically planned process, but rather an emergent process, strongly motivated by the entrepreneurs´ ability to identify trends and changes in the environmental conditions, which are mainly uncertain.

This is an interesting empirical finding that contradicts current literature that focuses on ¨how¨ companies grow, or "how should firms grow", identifying "better" or more sophisticated planning processes. By contrast, we identify Sarasvathy´ s idea (2001) about how "exposure to experiences" turns out to be a central element to develop high value learning to boost the growth in SMEs.

Conclusion

This study focuses on the investigation of specific capabilities associated with the growth of SMEs and shed light on some of the topics of DC that remained little explored. Specifically, we combine the literature on Entrepreneurship and Strategic Management to explore the strategic decisions that SMEs implement to grow in developing countries, and their results. We also provide empirical evidence on the role of DC in the growth of SMEs, specifically, comparing two important economic sectors.

Furthermore, the present study improves the understanding of DC, analyzing how SMEs create, identify and seize opportunities; and identify which specific capabilities led small and medium-sized to gain a sustainable market position and also to grow. Another contribution of this work is the empirical testing of theoretical constructs, particularly, applying a qualitative analysis that allowed us to identify the key aspects of the process of development of DC in SMEs. As a consequence, this study contributes to entrepreneurs and managers to understand the basis for firm sustainability based on specific capabilities associated to firm growth; and to policy makers to understand the dynamics of SMEs and obtain empirical evidence to formulate policies that foster firm growth. Furthermore, the present study proves that DC ´s framework may be applied in the analysis of SMEs in developing countries.

Based on the cases, it was found that all the companies had developed capabilities associated with sensing and seizing opportunities, and reconfiguring resources. However, these capabilities differed between cases, depending on the evolutionary paths of each business. This explanation of the importance of DC in the different phases or "jumps" in the growth path is another contribution of the present study.

Besides, our findings suggest that the process of identifying business opportunities implies an emergent process rather than a predetermined strategic decision. We also conclude that the identification of opportunities is not the most important threat, since companies have successfully recognized and evaluated important business opportunities with their existing resources and capabilities. On the contrary, firms faced many difficulties in seizing opportunities and adapting to changes.

To conclude, the main limitations of this study are the lack of analysis of other factors associated with DC and the lack of delineation in the scope of the capabilities addressed. Besides, results are drawn from a limited number of cases (8), and these companies are at different stages of development. These important issues should be considered for future research on DC.

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Abstrakt (in Polish)

Jakkolwiek rezultaty badań sugerują, że rozwój dynamicznych zdolności (DZ) stanowi kluczowy czynnik osiągania i zachowania przewagi konkurencyjnej dla wzrostu, nie zbadano w pełni w jaki sposób małe i średnie przedsiębiorstwa (MSP) tworzą, identyfikują i wykorzystują szanse na ekspansję, szczególnie w krajach rozwijających się i o ograniczonych zasobach. Celem badania jest określenie, w jaki sposób MSP budują zdolności do wzrostu w specyficznym kontekście krajów rozwijających się i w warunkach ograniczonych zasobów. Dla szczegółowego opisu tych procesów zastosowano jakościową metodykę, opartą na porównawczej analizie opisów przypadku ośmiu MSP, w sektorach oprogramowania i turystyki w Argentynie. Sektory te były uprzednio określone jako sektory dynamiczne i o wysokim potencjale wzrostu. Wyniki sugerują, że MSP rozwijają DZ głównie poprzez wyłaniający się proces powtarzalnych eksperymentów, nie zaś poprzez planowanie strategiczne. Proces ten polega na koordynacji organizacyjnych działań i zasobów, w której to koordynacji menedżerowie odgrywają kluczową rolę.

Słowa kluczowe: *wzrost firmy, dynamiczne zdolności, MSP, kraje rozwijające się.*

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Absorptive Capacity and Its Role for the Company Growth and Competitive Advantage: The Case of Frauenthal Automotive Toruń Company

Andrzej Lis[1], Agata Sudolska[2]

Abstract

The aim of the paper is to study the role of absorptive capacity for the company growth and competitive advantage through open innovations. The case of Frauenthal Automotive Toruń is used to explore how the routines and best practices associated with the firm absorptive capacity contribute to its success. The case study is to validate the thesis that through developing skills to recognize valuable knowledge in the environment, acquire this knowledge, assimilate, transform and develop it companies are able to apply and benefit from open innovations in order to grow and strengthen their competitive advantages. In order to achieve the aim of the paper the following research objectives have been set: (1) to identify the lessons and best practices applied in Frauenthal Automotive Toruń in relation to the company absorptive capacity; (2) to analyze the relationships between the concepts of absorptive capacity and open innovation; (3) to exemplify and discuss the outcomes of the company absorptive capacity in regard to innovations, company growth and competitive advantage.

Keywords: *absorptive capacity, open innovation, company growth, competitive advantage*

Introduction

Absorptive capacity is one of the concepts explaining how companies build up their abilities to learn from external partners and use the new knowledge to innovate and grow. Absorptive capacity is defined as "a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability" (Zahra & Goerge, 2002, p. 186). It encompasses the company ability to identify external

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knowledge and recognise its value, combine new elements of knowledge within the company knowledge base and apply new knowledge to create innovations in order to contribute to business success (Cohen & Levinthal, 1990; Zahra & George, 2002). The idea of absorptive capacity popularized by Cohen and Levinthal (1990) has been re-examined and reconceptualised by Zahra and George (2002) and Todorova and Durisin (2007). Zahra and George (2002) distinguish between two types of absorptive capacity: potential absorptive capacity (including knowledge acquisition and assimilation) and realized absorptive capacity (encompassing knowledge transformation and exploitation). Todorova and Durisin (2007) criticize the reconceptualization proposed by Zahra and George (2002), reject differentiation between potential and realized absorptive capacity and postulate reintroducing the elements of the original concept by Cohen and Levinthal (1990) such as "recognizing the value" of external knowledge.

The concept of absorptive capacity has been the subject of numerous research publications in recent 25 years. Nevertheless, there are still some aspects worth being explored. The relationships between the concepts of absorptive capacity and open innovations as well as the role of absorptive capacity for the company growth and competitive advantage seem to be such areas of great potential for further research. Having analyzed various approaches to measuring absorptive capacity, Duchek (2013, p. 325) concludes that previous methods mainly based on the quantitative perspective "do not address the complexity of the construct and barely recognize its routine-based character". As a remedy she suggests to employ "a practice-based approach and the use of qualitative methods, such as ethnographies and narratives, [which] are the most appropriate methods for identifying the routines and practices that build absorptive capacity". Therefore, the qualitative approach focused on the case study analysis is applied in the paper in order to explore the issue of absorptive capacity.

The aim of the paper is to contribute to the knowledge and research on the role of absorptive capacity for the company growth and competitive advantage. The empirical contribution of the paper concerns the case of Frauenthal Automotive Toruń that is used to explore how the routines and best practices associated with the firm absorptive capacity contribute to its growth and success. The main research question to be answered in the case study analysis is the following: *Is a company able to realize the potential of open innovations in order to grow and strengthen its competitive advantage through developing skills to recognize valuable knowledge in the environment, acquire this knowledge, assimilate, transform and develop it*?

Taking into account the aforementioned research problem, the following detailed questions have been addressed: (1) what are the lessons and best

practices identified in Frauenthal Automotive Toruń within the absorptive capacity process?; (2) what are the relationships between the concepts of absorptive capacity and open innovation?; (3) what are the outcomes of the Frauenthal Automotive Toruń absorptive capacity in regard to innovations, company growth and competitive advantage?

The paper consists of two parts: the theoretical grounding and the empirical research based on the case study analysis. The theoretical part, first of all, outlines the assumptions of the concept of absorptive capacity. Secondly, the relationships between the concepts of absorptive capacity and open innovation are discussed. Thirdly, the role of absorptive capacity for the firm growth and competitive advantage is analyzed. The literature review provides the foundation for the empirical research. The empirical part of the paper starts with the presentation of the context and the method of study. Then, absorptive capacity lessons and best practices identified in Frauenthal Automotive Toruń are studied. Finally, the mechanisms and outcomes of external knowledge application in the company under the study are discussed in order to analyze the role of absorptive capacity for the company innovations, growth and competitive advantage.

Theoretical grounding

The concept of absorptive capacity

The emergence of the concept of absorptive capacity is associated with the studies by Cohen and Levinthal (1989; 1990). Absorptive capacity is defined as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990, p. 128). Zahra and George (2002, p. 186) reconceptualize absorptive capacity and characterize it as "a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic capability". Absorptive capacity is based on individual abilities of organization members (Cohen and Levinthal, 1990, p. 131). However, as observed by Zahra and George (2002, p. 186) and Duchek (2013, p. 313), the concept of absorptive capacity is perceived mainly as an organizational construct.

Zahra and George (2002, p. 185) point out that the role of absorptive capacity is stressed in strategic management (cf. Lane & Lubatkin, 1998, Nahapiet & Ghosal, 1998), technology management (cf. Schilling, 1998), international business (cf. Kedia & Bhagat, 1988) and organizational economics (cf. Glass & Sagi, 1998). Duchek (2013, p. 313) places the construct of absorptive capacity "between the fields of organizational learning (Huber,

1991; Kim, 1998) knowledge management (Chiva & Alegre, 2005; Oshri, Pan & Newell, 2006), and dynamic capabilities (Mowery, Oxley, & Silverman, 1996)". Taking into account the aim of our study, the special attention is focused on relationships of absorptive capacity with strategic management, organizational learning and dynamic capabilities. From the strategic management point of view, the concept of absorptive capacity is usually associated with the assumptions of the resource-based view. Following this way of thinking, Nahapiet & Ghosal (1998) find social and intellectual capitals to be key sources of the company competitive advantage. Simultaneously, they claim that "social capital facilitates the development of intellectual capital by affecting the conditions necessary for [knowledge] combination and exchange to occur" (Nahapiet & Ghosal, 1998, p. 250). Lane & Lubatkin (1998, p. 462) "shift the unit of analysis of [Cohen's and Levintal's] construct from the firm to the 'student-teacher' pairing (the learning dyad)". They focus their study on relative absorptive capacity based on the assumption that the ability of a student-firm to effectively absorb new knowledge from its partner depends on relative characteristics of both organizations. The relationship between absorptive capacity and organizational learning is thoroughly studied by Anderson and Sun (2010, p. 130) who suggest that "absorptive capacity (a dynamic capability) is a concrete example of organizational learning that concerns an organization's relationship with new external knowledge". As regards dynamic capabilities, Mowery et al. (1996) include the issue of absorptive capacity in their study of inter-firm knowledge transfer within strategic alliances. They use absorptive capacity to "explain the effectiveness of technology-based capability transfer" (Mowery et al., 1996, p. 78) and suggest that absorptive capacity plays an important role for acquiring capabilities from alliance partners.

Zahra and George (2002, pp. 189-191) identify four components of absorptive capacity and group them into two categories: potential absorptive capacity (knowledge acquisition and assimilation) and realized absorptive capacity (knowledge transformation and exploitation). In their model, knowledge acquisition "refers to a firm's capability to identify and acquire externally generated knowledge that is critical to its operation". Knowledge assimilation is defined as "the firm's routines and processes that allow it to analyze, process, interpret and understand the information obtained from external sources". Knowledge transformation is explained as "a firm's capability to develop and refine the routines that facilitate combining existing knowledge and the newly acquired and assimilated knowledge". Knowledge exploitation encompasses "the routines that allow firms to refine, extend and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into operations".

The classification of the processes of knowledge acquisition, assimilation, transformation and exploitation is used by Jansen, Van Den Bosch and Volberda (2005) in their study of absorptive capacity intra-organizational antecedents. The Zahra and George model distinguishing between potential absorptive capacity and realized absorptive capacity is adopted, among others, by Fosfuri and Tribó (2008). Anderson and Sun (2010) study the relationships between absorptive capacity (based on the framework by Zahra and Gorge, 2002) and organizational learning (the 4I model). The 4I model proposed by Crossan, Lane and White (1999) corresponds to four processes of organizational learning i.e. intuiting, interpreting, integrating and institutionalizing. Anderson and Sun (2010, pp. 141-146) assume the involvement of organizational learning processes into the dimensions of absorptive capacity in the following way:

- knowledge acquisition – intuition and interpretation (individual and group learning);
- knowledge assimilation – interpretation (group learning);
- knowledge transformation – integration (group and organizational learning);
- knowledge exploitation – institutionalization (organizational learning).

The aforementioned examples point out that the reconceptualization of the absorptive capacity concept by Zahra and George (2002) is widely discussed and accepted. Nevertheless, there are some researchers (e.g. Todorova & Durisin, 2007) who criticize this reconceptualization and postulate reintroducing the elements of the original concept by Cohen and Levinthal (1990) such as "recognizing the value" of external knowledge. Todorova and Durisin (2007) perceive knowledge assimilation and knowledge transformation as two alternative processes instead of sequential relationship between them as proposed by Zahra and George (2002). Moreover, Todorova and Durisin (2007) are very skeptical as regards distinguishing between potential and realized absorptive capacity claiming that their definitions are ambiguous and unclear. Combining the approaches represented by Cohen and Levinthal (1990) and Zahra and George (2002), and taking into account the objections reported by Todorova and Durisin (2007), Sudolska and Lis (2014, p. 118) define the scope of absorptive capacity components in the following way: "identifying and recognizing external knowledge, processing and understanding it, combining it with existing knowledge and applying new knowledge to commercial ends".

From the practical point of view, the mechanisms and practices included into company absorptive capacity are the issues of paramount importance. For instance, in their model of absorptive capacity, Zahra and George (2002, p. 194) identify the so-called social integration mechanisms which enable

companies to benefit from the potential of their absorptive capacities (shift from potential absorptive capacity to realized absorptive capacity). Such mechanisms may be of formal character (e.g. coordinators) or informal character (e.g. social networks). In her case study of a medium-sized, family-owned, high-tech German company operating in an engineering industry, Duchek (2013, pp. 324-325) focuses on knowledge absorption practices. Among the examples of such practices she identifies: technology scouting (for knowledge acquisition), face-to-face communication (for knowledge assimilation) and informal promotion of new ideas by key organization members (for knowledge exploitation). Technology scouting refers to "a structured observation and early recognition of opportunities, relevant changes and technological developments". Technology scouting is practiced through an active search for knowledge sources in the Internet, branch and scientific publications for external knowledge to be employed into company projects; participation in conferences, forums, training sessions in order to be acquainted with new knowledge in the field and importing identified knowledge into an organization. Face-to-face communication is found a prerequisite to effectively share knowledge, discuss complex issues, provide/receive feedback and establish networks within an organization. The roles of key leaders' engagement encompass: introducing new ideas into an organization, convincing the company stakeholders in order to get all required approvals and playing as change agents.

The relationships between the concepts of absorptive capacity and open innovation

As said before, absorptive capacity is commonly understood as firm's ability to recognize the value of new knowledge, to assimilate it and apply it to commercial ends (Cohen & Levinthal, 1990, p. 128). Based on this approach, we would like to focus on the links between both: the concepts of open innovation and absorptive capacity. Combining these two concepts leads to the insight into the role of absorptive capacity in opening up innovation processes of a firm (Lewandowska, 2015). The issues of the relationships between absorptive capacity and open innovation have drawn attention of several researchers providing different proposals related to absorptive capacity in the context of open innovation paradigm (Lichtenthalter & Lichtenthalter, 2009; Hughes & Warenham, 2010; Wallin & von Krogh, 2010; King & Lakhani, 2011; Robertson, Casali & Jacobson, 2012; Lewandowska, 2015).

The idea of open innovation has received an increased attention over the past decade (Chesbrough, 2006; Laursen & Salter, 2006; Ebersberger, Herstad,

Iversen, Som & Kirner, 2011). The concept describes a cognitive framework for an organization's strategy to profit from innovativeness. Its fundamental idea concerns opening up firm's innovation process (Huizingh, 2011). Open innovation is an approach that focuses on the need for any organization to transcend its boundaries and concentrate on purposive inflows and outflows of information and knowledge to accelerate organizational internal innovativeness, but also to allow the external market users to benefit from organization's innovations. The use of above mentioned purposive inflows of knowledge is called inbound open innovation, while purposive outflows are described as outbound open innovation.

In practice, open innovation leads to the increase of organization's boundaries permeability and the need to interact with its environment in more open ways. Open innovation processes combine internal and external ideas into organization's architecture and system. According to the mentioned approach, various projects can be launched from internal or external sources but on the other hand the projects can go to the market in many ways, for example through outlicensing or a spin-off venture company, in addition to entering the market through the organization's sales channels (Chesbrough, 2008). The literature includes a number of studies that highlight the positive relationship between increased linkages and knowledge flows from several external sources that an organization uses and the improved innovation outcomes of this organization (Fey & Birkinshaw, 2005; Keil, Maula, Schildt & Zahra, 2008; Leiponen & Helfat, 2010). Above mentioned studies suggest that the increased openness towards external partners results in the increased innovation outcomes for an organization.

While searching for the links between absorptive capacity and open innovation we have to point out that the use of purposive inflows of knowledge, called inbound open innovation that concerns internal usage of knowledge acquired from external sources, directly refers to company's absorptive capacity. This point of view is shared by most researchers in the field. Hughes and Warenham (2010), who have held the comprehensive review of relevant literature (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998; Tsai, 2001; Lane, Salk & Lyles, 2001; Zahra & George, 2002; Liao, Welsch & Stoica, 2003; Jansen et al., 2005; Lane, Koka & Pathak, 2006) conclude with the statement that most-cited studies of absorptive capacity focus mainly on inbound activities. Simultaneously, Lichtenthaler and Lichtenthaler highlight that absorptive capacity as the concept paying attention to utilizing external ideas and knowledge inside a company, somehow neglects other significant processes related to knowledge management, e.g. internal knowledge creation that seems to be important for open innovation processes (Lichtenthalter & Lichtenthalter, 2009).

Considering the relationships between the concepts of absorptive capacity and open innovation, it should be underlined that implementing open innovation in an enterprise has a strong impact on its resources and capabilities and thus on its competitiveness. Due to this opening up, enterprise's innovation processes entails a need of developing its internal dynamic capabilities, including absorptive capacity (Zahra & George, 2002; Lewandowska 2015).

On the other hand, tracking works of Cohen and Levinthal (1990) and King and Lakhani (2011) leads us to the assumption that opening up firm's innovation processes influence the increase of its absorptive capacity. Combining Cohen and Levinthal's (1990) and King and Lakhani (2011) approaches allows us to state that absorptive capacity comprises two elements:

- firm's capacity to adopt ideas and knowledge from external sources which may be called "adoption capacity",
- firm's capacity to utilize ideas and knowledge from external sources and create new inventions which may be called "invention capacity".

King and Lakhani empirically prove that experience with adoption of externally created inventions increases both adoption capacity and invention capacity (King & Lakhani, 2011). Experience concerning adoption allows the company to better and easier absorb new external knowledge. This suggests that organization's experience in the field of open innovation leads to the enhancement of absorptive capacity, although according to the traditional point of view it is absorptive capacity which contributes to the implementation of open innovations. The relationships between the concepts of absorptive capacity and open innovation are presented in Figure 1.

In Figure 1, we make an attempt to accommodate and present graphically the variety of approaches to define absorptive capacity and enumerate its components. Then, we embed the construct of absorptive capacity in the context of open innovation. The model is a compromise between the re-conceptualizations of absorptive capacity by Zahra and George (2002) and Todorowa and Durisin (2007). It is constructed around "organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge" (Zahra & George, 2002, p. 186). It distinguishes between potential and realized absorptive capacity (Zahra & George, 2002) as well as adoption and invention absorptive capacity (King & Lakhani, 2011). However, following the recommendations by Todorowa and Durisin (2007), we added the component of knowledge recognition. Moreover, we consider knowledge assimilation and transformation as alternative processes not necessarily following each other as a sequence. In our model inbound open innovation that concerns internal usage of knowledge acquired from external

sources directly refers to company's absorptive capacity. Simultaneously, the outcomes of company absorptive capacity embodied in innovations may outflow to the market through outlicensing or sharing knowledge with partners (outbound open innovations).

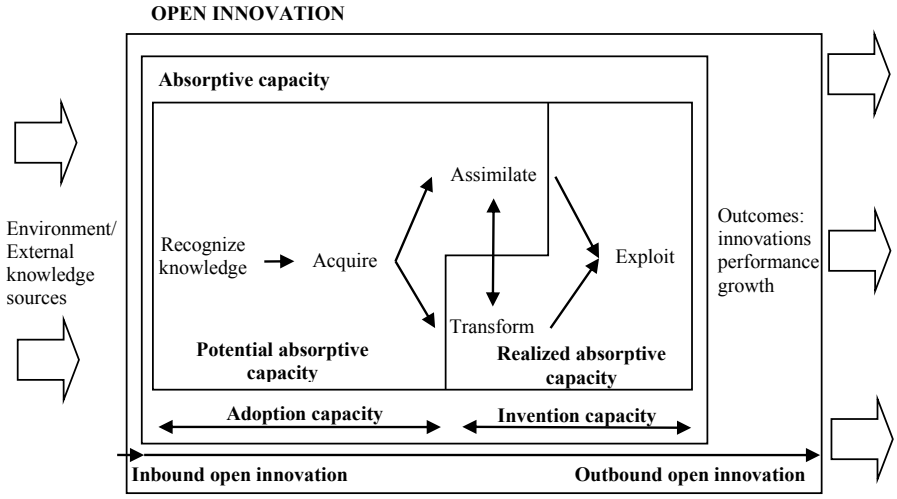

Figure. 1. Absorptive capacity in an open innovation context

Source: Elaborated by authors, inspired by Hughes and Wareham (2010, p. 333).

While considering the issues concerning the relationships between absorptive capacity and open innovation, Wallin and von Krogh (2010) suggest that five stages of the open innovation process can be distinguished:

- defining innovation process,
- identifying innovation-relevant knowledge,
- selecting an appropriate integration mechanism,
- creating effective governance mechanisms,
- balancing incentives as well as controls.

Despite these authors analyze all five stages, they pay special attention to the one that is knowledge integration which in fact is a component of the invention capacity which, as previously stated, refers to organization's capacity to utilize (and integrate) external knowledge and thus create novelty.

Wallin and von Krogh (2010) point out that innovation-oriented executives have to predict particular activities needed to be taken as moving through the whole innovation process, e.g. from the idea to a product launch in the market. Going further, performing these activities requires specific innovation-relevant knowledge that exists inside or outside a firm. While such knowledge is found outside a firm, choosing an appropriate integration mechanism becomes necessary. As highlighted by aforementioned authors,

the issue of enabling knowledge integration refers to specifying the ways how employees, teams, as well as some sources external to the firm, contribute to subsequent stages of innovation process (Wallin & von Krogh, 2010, p. 149).

While considering the issue of knowledge integration (as a part of the open innovation process), it seems central here to focus on firm's receptivity which can be described as a kind of enterprise's attitude towards new knowledge. The more receptive both executives and employees are to new ideas and knowledge, the more likely they are to learn and change. Firm's openness towards novelty combined with its receptivity is directly related to its absorptive capacity. An enterprise receptivity highly depends on the availability of time and resources (money, people, data bases, knowledge etc.) assigned to engage in the processes of gathering knowledge and embedding it within its own routines through employees training or investment in new equipment (Child, Faulkner & Tallman, 2005, pp. 285-286). Therefore, it influences firm's invention capacity being a component of absorptive capacity. This explains why some companies embedded in several business relationships and networks that allow to absorb knowledge, remain non-innovative. It can be assumed that they do not possess enough invention capacity and in turn they are not able to assimilate the absorbed knowledge and capture value from it.

The role of absorptive capacity for firm growth and competitive advantage

Among pertinent issues regarding a firm's absorptive capacity, there is a necessity for underling its importance for company growth. Having to bear in mind that there are different views regarding firm growth value (Chandler & Jansen, 1992; Gartner, 1997; Lee, Smith, Grimm & Schomburg, 2000; Markman & Gartner, 2002), we refer to the perspective according to which company growth is perceived as a precursor to achieve its sustainable competitive advantage (Lee et al., 2000; Markman & Gartner, 2002). In recent decades it has been also recognized that strengthening company's absorptive capacity brings about several outcomes related to its growth and competitive advantage. As highlighted by Teece, "the competitive advantage of firms in today's economy stems not from market position, but from difficult to replicate knowledge assets and the manner in which they are deployed" (Teece, 1998, p. 62). This opinion may be explained by the fact that knowledge assets meet the most important requirements of the strategic resources considered to be the prerequisites for a firm's long term competitive advantage i.e. they are: valuable, rare, difficult to imitate and difficult to be replaced by other resources (Barney, 1991).

Among the obvious advantages of having access to new external knowledge both the researchers and practitioners mention: lower costs, shorter time to market, number of innovations increase, more sales and other financial benefits as well as non-financial benefits e.g. clarifying company's core competences (Huizingh, 2011; Rigby & Zook, 2002). As recognizing and then acquiring new knowledge a company activates its absorptive capacity, it can be said that having an access to new external knowledge is a prerequisite for generating any absorptive capacity outcomes. It must be remembered that analyzing this kind of outputs requires taking into account both commercial outcomes (e.g. new products, patents) and knowledge outputs (e.g. technical, scientific or organizational knowledge). Despite the category of the realized outcomes, all of them have an impact on a company's future absorptive capacity (Lane et al., 2006). In other words, firm's focus on enhancing its absorptive capacity and generating particular results (new values) naturally influences the possibility of firm growth.

While considering the issue of the absorptive capacity importance for firm growth, it seems worth to examine the motives of the firms searching for external knowledge acquisition and exploitation. As highlighted by several authors, the empirical research proves that offensive motives are much more frequent than defensive ones (Chesbrough & Crowther, 2006; Van de Vrande, de Jong, Vanhaverbeke & de Rochemont, 2009). Due to the fact that focusing on absorbing knowledge from outside the company in order to transform it into new value is definitely offensive activity, we assume that enterprises which concentrate on enhancing their ability to recognize new needed knowledge, then assimilate and transfer it to apply it to commercial ends, also aim at their growth (and development).

While discussing about enterprise resource base and its links to absorptive capacity and growth, it seems necessary to point out that Zahra and George (2002, p. 185) perceive absorptive capacity as "a dynamic capability pertaining to knowledge creation and utilization that enhances a firm's ability to gain and sustain a competitive advantage". As it is commonly known, dynamic capabilities are enterprise routines allowing the executives to change company's resource base through acquiring, shedding, integrating as well as recombining resources in order to create new value and strengthen firm's competitive advantage (Eisenhardt & Martin, 2000; Sapienza, Autio, George & Zahra, 2006). What is worth underlying, Zahra and George (2002) distinguish between the role of potential absorptive capacity (including knowledge acquisition and assimilation) and realized absorptive capacity (knowledge transformation and exploitation) for competitive advantage. They assume that potential absorptive capacity supports sustaining competitive advantage through flexibility in resource reconfiguration, effective timing

of capability deployment and lower costs. However, realized absorptive capacity is required in order to build up company competitive advantage with innovations and product development. Innovative processes or products result from company realized absorptive capacity which involves knowledge transformation and exploitation. These new products or processes allow to introduce the modifications within competitive tools used by the firm on the market. This in turn leads to gaining competitive advantage over company's rivals.

Simultaneously, Zahra and George highlight that a strong regime of appropriability is necessary to protect company knowledge assets and realize effectively its absorptive capacity through innovations due to high costs of potential imitation by competitors (Zahra & George, 2002, p. 195-197). The regime of appropriability is needed because accumulating knowledge both from possible internal and external sources is of strategic importance today. As mentioned before, knowledge has been recognized as one of firm's strategic assets. Due to this, on one hand the executives have to focus on acquiring new knowledge and reconfiguring a possessed resource base, but on the other hand they must draw their attention to retaining the uniqueness and value of their knowledge assets that allow a firm to generate innovations and achieve better results than competitors do (Jashapara, 2004).

Taking into account the aforementioned considerations, we can say that enhancing firm's absorptive capacity seems to have a strong impact on the firm's growth and competitive advantage.

Absorptive capacity in Frauenthal Automotive Toruń

The context of the study

Frauenthal Automotive Toruń (formerly Pol-Necks) is a medium size company (ca. 150 employees) operating in the automotive component industry. The company supplies world leading truck manufacturers with u-bolts. U-bolts are metal elements of U letter shape with screw threads on both sides. They may be manufactured both in hot and cold bending technology. U-bolts produced by Frauenthal Automotive Toruń are used for mounting springs on the axles of heavy vehicles to fasten a truck chassis and a body. Due to their critical impact on vehicles safety, u-bolts are to meet very high quality standards. Key customers of the company include: Volvo (32% of sales in 2013), Scania (27%), BPW (21%) and Renault Trucks (15%). Frauenthal Automotive Toruń is the industry leader in developing and producing u-bolts for commercial vehicles in Europe and the second top world producer of u-bolts. Moreover, Frauenthal Automotive Toruń manufactures pins and screws. The company

products are used for the following applications: heavy duty trucks, commercial vehicles, heavy duty trailers, steel constructions (e.g. windmills, cranes), agriculture machines and tractors, construction machines, buses and coaches and mechanical engineering.

Pol-Necks was established in Toruń, Poland in 1993 by a Swedish entrepreneur. From its beginning, the company has been operating in the metal processing branch. In the history of the company, there are three milestones worth mentioning. Firstly, in 2000, the manufacturing of u-bolts started and since this date the company has grown to become the leader of the European u-bolt market. Secondly, in 2007, the company was acquired by an Austrian corporation Frauenthal Automotive Components. As a consequence of the takeover, the company reorganization was implemented which resulted in the shift from the family business model to the corporate business model. The company changed its name to Frauenthal Automotive Toruń in 2012 which symbolically crowned the reorganization process. The third turning point was the world economic crisis which had a significant, negative influence on the company operations. In 2009, the yearly production of u-bolts plummeted to 750 000 pieces from the level of 2 000 000 one year earlier. Due to its resilience, the company survived hard times and it restored the former level of production in 2010. Nowadays, the company output is 2 500 000 pieces of u-bolts per year. In, 2011 Frauenthal Automotive Toruń implemented management systems: Quality Management System ISO/TS 16949:2002, Environmental Management System ISO 14001:2004 and Safety Management System OHSAS 18001:2007. Since 2010, the company has been introducing and developing the Lean Management program.

The company proudly declares its "focus to develop new innovative products" as well as "continuous productivity investments and dedication to Lean Manufacturing". Due to its dedication to continuous learning, positive organizational potential (cf. Lis, 2013) as well as organizational culture and climate conducive to knowledge management, Frauenthal Automotive Toruń seems to be an interesting case to study absorptive capacity practices and its role for the company innovations, growth and competitive advantage.

The method of the study

The single case study analysis of the Frauenthal Automotive Toruń company is the research method applied to achieve the aim of the paper. The main advantage of the case study method is using empirical evidence from real organizations to contribute to the knowledge in the field (Myers, 2010). Moreover, as observed by Duchek (2013), the case study method has a great potential to study the issue of absorptive capacity. The process of designing

and conducting the research has encompassed the following stages (Yin, 2010; Strumińska-Kutra & Koładkiewicz, 2012; cf. Patton & Appelbaum, 2003; Stake, 2010): (1) defining study questions and propositions; (2) selecting the unit of analysis and the sample within the studied case; (3) planning and collecting data; (4) analyzing data; and (5) writing a report.

In order to achieve the aim and objectives of the paper, the following study questions were set: (1) how does Frauenthal Automotive Toruń recognize the value of external knowledge, acquire it, assimilate, transform and exploit? (2) what are the relationships between absorptive capacity and open innovations in the company under the study? (3) how does the company absorptive capacity contribute to its innovations, growth and competitive advantage? The aforementioned study questions provided the foundation for the following proposition to be validated in the research process: *through developing skills to recognize valuable knowledge in the environment, acquire this knowledge, assimilate, transform and develop it companies are able to realize the potential of open innovations in order to improve their performance and grow*.

The single case study of Frauenthal Automotive is chosen as the unit of analysis. The single case study enables us to study thoroughly and to understand the unit of analysis within its context. Certainly, we are aware that any attempts to generalize on the basis of the single case study are challenging while pattern matching with theoretical assumptions and explanation building become very difficult (Strumińska-Kutra & Koładkiewicz, 2012, p. 5).

The following methods were applied to collect the data necessary for analysis: interviews, questionnaires and observation. The research process consisted of three stages. First of all, the pilot interview with a representative of company management was conducted in July 2015 in order to ensure that Frauenthal Automotive Toruń was a relevant case to study the relationships between absorptive capacity, open innovations and firm growth and competitive advantage. Moreover, the pilot study enabled us to acquire general understanding of issues related to absorptive capacity in the company. Secondly, in October 2015, the questionnaire survey was conducted. Its aim was to assess the level of absorptive capacity components in Frauenthal Automotive Toruń. Thirdly, in order to collect data necessary for thorough qualitative analysis, interviews with the representatives of the management team were conducted in October 2015.

The questionnaire survey was conducted among the members of the board and employees of the following departments: sales, finances, HR, logistics and production. Questionnaires were distributed among employees having knowledge of inter-organizational learning processes occurring between

Frauenthal Automotive Toruń and its external partners. Questionnaires were circulated via the HR Manager who was nominated the company main point of contact for this research project. In total, 15 employees contributed with their questionnaires. The questionnaire included the scales and items of potential and realized absorptive capacity proposed and validated by Jansen et al. (2005). Questions related to knowledge acquisition (6 items), knowledge assimilation (3 items), knowledge transformation (6 items) and knowledge exploitation (6 items). All of them referred to ongoing activities of the company.

There were five managers who contributed with interviews including: the chief executing officer, the member of the board responsible for sales and marketing, the sales manager, the chief of production and the HR manager. The interviewees were selected according to their position in the organizational structure and knowledge of inter-firm learning processes. Structured interviews were focused on three issues: absorptive capacity practices, its antecedents and impact on the firm growth and competitive advantage. The average length of each interview was between 60 and 90 minutes. Four of them were conducted at the company site in Toruń, Poland. One interview was taken outside the company location, in the city of Toruń. The interviews were not recorded. The paper and pencil technique was applied to take notes. As regards time perspective, the attention was focused on ongoing operations and activities. When some references were made to the history of the company it encompassed the period of time since 2007, when the company was acquired by the Austrian corporation Frauenthal Automotive Components and shifted from the family business model to the corporate business model.

The findings from interviews and the questionnaire survey were confronted with the conclusions drawn by authors from their participatory observation of Frauenthal Automotive Toruń learning processes while cooperating with the company. The selection of data collection methods ensured an appropriate level of triangulation. Following the principles of gathering evidence such as: triangulation, case study data base and chain of evidence (cf. Rowley, 2002) contributed to the quality level of the study.

The level of absorptive capacity in Frauenthal Automotive Toruń

In order to to assess the level of absorptive capacity components in Frauenthal Automotive Toruń and to confirm our prediction that the company is a good case to study the issues related to absorptive capacity we used the Jansen's et al. (2005, p. 1014) scales and items of potential and realized absorptive capacity to conduct the exploratory research. The questionnaire survey

enabled us to make a comparative analysis of Frauenthal Automotive Toruń absorptive capacity with the benchmark proposed by Jansen et al. (2005). The finding are presented in Table 1.

Table 1. The comparative analysis of Frauenthal Automotive Toruń absorptive capacity

Variable	Frauenthal Automotive Toruń (n=15)		Benchmark (n=462)	
	Mean	**s.d.**	**Mean**	**s.d.**
Acquisition	3.79	1.66	3.58	1.24
Assimilation	4.64	1.28	4.74	1.13
Transformation	4.34	1.42	4.61	0.83
Exploitation	5.07	1.66	5.26	1.72

Source: Authors' research combined with data from Jansen et al. (2005, p. 1007).

The findings show that the absorptive capacity of Frauenthal Automotive Toruń is very close to the benchmark used by Jansen et al. (2005). What is worth emphasizing, Frauenthal Automotive Toruń capability to acquire new, external knowledge even exceeds the level of the benchmark. As regards knowledge acquisition, collecting industry information through informal means (e.g. lunches with industry friends, talks with trade partners) is the item which received the highest score. All the components of knowledge assimilation (i.e. quickly recognizing market shifts, understanding new chances to satisfy customers, as well as analyzing and interpreting changes in market demands) were assessed at the similar level close the mean value. In the field of knowledge transformation, the firm was found to be particularly good at intra-organizational knowledge transfer among the employees. In regard to knowledge exploitation, Frauenthal Automotive Toruń seems to be a master in cooperating with its customers and responding to any complaints and weeks signals from them. The findings presented and discussed above confirm that Frauenthal Auomotive Toruń is a good unit of the case study analysis aimed at exploring how the routines and best practices associated with the firm absorptive capacity contribute to its growth and success.

Lessons and best practices in absorptive capacity

Frauenthal Automotive Toruń makes attempts to identify, recognize and acquire new, external knowledge from numerous sources within its environment. Learning from other companies in the Frauenthal group and sharing with them lessons identified and best practices is the first and the most obvious field of the inter-firm knowledge transfer. The employees attend

branch fairs and exhibitions in order to seek new solutions which could be applicable in the company. These are usually pre-planned knowledge-seeking activities. Before such events, clear learning objectives are set for participants who are expected to focus their attention on knowledge and solutions needed in the company. Nevertheless, lessons and ideas from other fields are also welcomed. The company closely cooperates with customers, responding to their needs and new requirements as well as to any complaints and weak signals. The respondents mention regular meetings with supply quality assurance managers of customers' companies. It is of particular importance in the automotive industry where customers review the processes and try to optimize them. Moreover, chosen employees are able to visit customer companies in order to learn about their processes (active learning) which is considered to be the reward for these employees. Similarly, it is necessary to highlight a close cooperation with suppliers of machines and equipment, who are engaged in solving company problems through organizing training sessions and sharing knowledge with Frauenthal Automotive Toruń employees. Attending "supplier days" employees gain from the suppliers knowledge concerning the standards of their processes. What is very interesting is the direct learning relationship with competitors (competitive benchmarking). Competitors are visited by the members of the management team (CEO, directors). Managers bring to the company new ideas and share them with other employees. According to the rule of reciprocity competitors visit the company site. The examples of coopetition are the projects aimed at entering the Brasilian market and comparing the way and use of tools that were bought from the same supplier. Last but not least, the company cooperation with the academia should be mentioned. Frauenthal Automotive Toruń cooperates with Nicolaus Copernicus University, Toruń and Casimir the Great University, Bydgoszcz. The company participates in scientific research projects in metal processing and management studies and applies their outcomes in business practice. The company receives students completing their apprenticeships and conducting study projects. As highlighted by interviewees, students and scholars bring to the company new, fresh ideas and they make employees more sensitive to valuable, external knowledge.

Frauenthal Automotive Toruń has developed the set of the techniques and practices used for processing, understanding and assimilating new, external knowledge. The examples include: writing memos after meetings with external partners, visits etc., disseminating new knowledge among subordinates or colleagues during daily working meetings, discussing whether this new knowledge has potential to be exploited in the company. Employees meet and share new knowledge that they acquired during trainings, they prepare presentations and explain new ideas to others. What should be

emphasized, employees expect from their managers and colleagues sharing knowledge they acquired while meeting external partners or visiting their sites. Sharing newly acquired knowledge is especially important for departments which, due to their position within the organizational structure, have less opportunities to cooperate with external partners. For instance, the production department acquires external knowledge through "gate keepers" (e.g. logistics provides them with "hot" knowledge from customers). In order to facilitate knowledge processing and knowledge sharing among employees the company established the electronic knowledge repositories (Frauenthalpedia, Management Planet).

Transforming new, external knowledge and combining it with prior existing knowledge is the next step within the absorptive capacity process. In Frauenthal Automotive Toruń, there are organized meetings where managers and employees analyze knowledge gaps and the ways to fill them with external knowledge. The respondents highlight positive outcomes of combining the external knowledge with the small suggestion system operating in the company in order to generate best solutions to identified problems and challenges.

Table 2. Frauenthal Automotive Toruń routines, lessons and best practices in absorptive capacity

Potential absorptive capacity		**Realized absorptive capacity**	
Acquisition	**Assimilation**	**Transformation**	**Exploitation**
setting clear learning objectives for employees attending branch fairs and exhibitions in order to seek new knowledge and solutions meeting regularly with the representatives of customers (e.g. supply quality assurance managers) visiting customers to learn about their processes visiting competitors (competitive benchmarking) engaging suppliers in solving company problems through organizing training sessions and inviting suppliers to share knowledge with company employees participating in research projects conducted by academia receiving students for apprenticeships	writing memos after meetings with external partners, visits etc. disseminating new knowledge among subordinates or colleagues during daily working meetings discussing in teams the potential of new knowledge to be exploited in the company establishing electronic knowledge repositories	organizing meetings where managers and employees analyze knowledge gaps and the ways to fill them with external knowledge combining external knowledge with the employee suggestion system in order to generate solutions to identified problems and challenges	promoting the culture of openness to change (low change resistance) and improvement promoting the development of "ambassadors of changes" able to persuade novelty to other workers

The respondents emphasize a "good mixture" of factors related to organizational culture and employee attitudes and behaviors which are very conducive for exploiting new, external knowledge. First of all, the openness to change (low change resistance) regarding employees' attitudes is to be mentioned. Secondly, lots of employees working for the company for a long time have already adjusted to permanent changes and improvements. Thirdly, Frauenthal Automotive Toruń focuses on hiring so called "talents" who are engaged in their work. Fourthly, it always focuses on having some "ambassadors of changes" who are able to persuade novelty to other workers.

Summing up, the examples of routines, lessons and best practices related to absorptive capacity identified in Frauenthal Automotive Toruń are collected in Table 2.

Through open innovation to company growth and competitive advantage

The absorptive capacity enables Frauenthal Automotive Toruń to implement innovations leading to improvements and higher efficiency in production and administration processes, and in consequence to lower costs and higher quality.

The interviews with company managers provide some interesting examples of transforming and exploiting external knowledge for company innovations. U-bolts production is a niche business. Therefore, companies operating in the industry design and build new machines on their own. Designing new machines, due to some ideas imported from external partners, which led to the increase in the company productivity is enumerated among some of positive outcomes of realized absorptive capacity. In consequence, the number of workers necessary to operate the production line significantly decreased. However, Frauenthal Automotive Toruń recognizes the role of positive organizational climate as well as employee attitudes and behaviors for innovation and company growth. Therefore, the company maintained the level of employment deploying workers from the production line to other functional areas. Another example of absorbing and exploiting external knowledge for company purposes supported aforementioned efforts to maintain the level of employment. Frauenthal Automotive Toruń was able to successfully transfer particular operations (steel drawing) from one of its suppliers. This example of insourcing resulted in the company's higher control of material quality which has very positive market outcomes. One of the customers has already ordered products made of this kind of steel and two other companies are almost decided to order them. Moreover, Frauenthal Automotive Toruń became a 'development partner" of such companies

producing trucks as Man or Scania. In the metal processing industry, the quality of materials is one of the key success factors. Therefore, the company seeks opportunities to innovate within this area. The project aimed at obtaining the steel of higher quality in cooperation with one of German steel mills is one of the initiatives undertaken to achieve this objective. As a result the mill now is producing the new kind of steel that is specially dedicated for the company and has better technical parameters. Moreover, as a result of learning from the external environment, Frauenthal Automotive Toruń has changed the way of marking its products. Previously, marks were vertically located on the product and the company changed it to horizontally marking. In turn this innovation resulted in lowering the risk of surface cracks and thus it improved the life-span of the product.

Acquiring new external knowledge allows the company to decrease the price of products. Due to frequent audits conducted by its customers, the company is obliged to introduce continuous improvement that should result in lowering costs and thus prices – these are the regulations concerning firms that are Original Equipment Manufacturing firms. Lowering costs allows more flexible price policy. As Frauenthal Automotive Toruń is regarded as Original Equipment Manufacturing firm, it is obliged to deliver highest quality products, which builds company's reputation on the market. Leading truck producers do not cooperate with firms that are not Original Equipment Manufacturing companies. Due to this, permanent improvement and focus on innovations enable the company to win new contracts on the global market. Moreover, business contacts with truck production leaders are considered as recommendations for Frauenthal Automotive Toruń while entering new market areas.

There is another important outcome of Frauenthal Automotive Toruń absorptive capacity and innovativeness: the change of employee mentality and behaviors. When employees realize that they can propose some changes which are introduced in the company and they are rewarded for this, they start thinking about new changes. It develops pro-innovating thinking and behaviors of workers. Employees are encouraged to propose improvement ideas and schemes which are assessed by special committee. If these changes result in some real improvements the employee is rewarded.

Discussion

The paper conceptual contribution is demonstrating the role and importance of enterprise absorptive capacity for its innovations, growth and competitive advantage. The considerations, both theoretical and empirical, presented in the paper have highlighted and proved that through developing skills to

recognize valuable external knowledge, acquire it, assimilate, transform and develop this knowledge, firms are able to realize the potential of open innovations in order to improve their performance and grow.

The results presented in the paper are aligned with the evidence found in the relevant literature. The literature sources include a number of empirical investigations that highlight enterprise growth as one of significant benefits derived from developing firm's absorptive capacity. The outcomes related to organization's growth obtained through absorbing and utilization of new knowledge have been discussed by several authors (e.g. Zahra, Ireland & Hitt, 2000; Autio, Sapienza & Almeida, 2000; Sapienza et al., 2006, Naldi, 2010). Combining our research findings with those of aforementioned authors proves that focusing on acquiring new knowledge, assimilating it and then applying to commercial ends facilitates company's growth and success.

The empirical contribution of the paper refers to exploring how the routines and best practices associated with Frauenthal Automotive Toruń absorptive capacity contribute to company growth and success. The paper contributes to the research on absorptive capacity issues through exploring the lessons and best practices applied in Frauenthal Automotive Toruń within the absorptive capacity process; analyzing the links between the concepts of absorptive capacity and open innovation and discussing the outcomes of the Frauenthal Automotive Toruń absorptive capacity development regarding innovations, company growth and competitive advantage.

Our findings provide useful managerial implications referring to the importance of both executives and employees consciousness regarding learning from external sources and change acceptance. We have sought to identify and point out the best practices applied in Frauenthal Automotive Toruń within the absorptive capacity process. Our results provide us with the correctness that at each stage of absorptive capacity process (knowledge recognition, acquisition, assimilation, transformation and exploitation) the most significant variable is the mentality of managers and employees. Due to this, the executives should be aware that the first and necessary step to focus on absorptive capacity development, is introducing a system supporting both pro-innovative thinking and pro-innovative behaviors of all organization members.

Building such a system is directly related to all activities aimed at creating the organizational climate favorable to innovations (also called pro-innovative organizational climate). According to relevant literature, organizational climate refers to a reality containing the patterns of behavior, attitudes as well as feeling that describes organization's life (Isaksen, Lauer, Ekval & Britz, 2001; Isaken & Ekval, 2010). In other words, organizational climate is a kind of specific atmosphere within a firm that influences both executives and

employees behaviors at work, particularly in terms of their motivation and commitment to work. Pro-innovative organizational climate supports the development, assimilation and utilization of new knowledge (Isaksen et al., 2001) and promotes the creation of any kind of novelty (products, services, ways of working, etc.).

As organizational climate favorable to innovations is a multi-dimensional issue, the relevant literature provides several typologies of variables and dimensions that are considered as critical to shape it within a company (Amabile, Conti, Coon, Lazenby & Herron, 1996; Loewe & Dominiquini, 2006; Hunter, Bedell & Mumford, 2007; Isaken & Ekval, 2010). Analyzing and combining those typologies, it should be underlined that introducing a system and climate supporting pro-innovative thinking and behaviors of employees is primarily associated with both managers and workers' intellectual stimulation, encouraging them to challenge and risk taking, providing time and resources for elaborating new ideas, promoting sharing knowledge, experience as well as new ideas, allowing disagreements between viewpoints which in fact means creative debating etc. Additionally, the trust and openness dimension is of significant importance. It seems critical to provide employees with emotional safety and feeling comfortable while sharing ideas with each other. Moreover, the way new ideas are treated is said to be critical to encourage pro-innovative thinking and behaviors of employees. The perception that innovative performance is tied to rewards in the organization is highly supporting while shaping pro-innovative system within a company. Also, promoting the message that the organization is committed to quality and originality of ideas is pointed out as one of creative climate dimensions (Hunter et al., 2007; Isaken & Ekval, 2010).

Taking into account the aforementioned, it should be stated that in a company which aims at creating and commercializing innovations and so obtaining growth, considerable attention has to be placed on the policy of "small steps towards novelty". This means conducting the activities focused on first changing employees' mentality (way of thinking) and thus behaviors concerning changes and novelty. It is indisputable that only people who understand the need for change (innovation) and who derive benefits from it, are able to engage in any stage regarding absorptive capacity process. Moreover, it is critical that all organization members have a shared understanding of the importance of learning from outside the company which in fact means firm's receptivity.

Conclusion

The case study of Frauenthal Automotive Toruń encompasses a wide spectrum of activities related to both potential and realized (or adoption and invention) absorptive capacity of the firm. The analyzed enterprise has at its disposal necessary tangible and intangible resources to engage in the processes of gathering knowledge and embedding it within its own routines. The examples of enablers include: IT infrastructure supporting knowledge management (knowledge repositories such as Frauenthalpedia and Management Planet) and relational capital (encompassing among others customers, suppliers, higher education institutions). Implemented management systems and the Lean Management program as well as a high level of positive organizational potential establish the environment conducive to intra-organizational and inter-organizational learning. This in turn influences the invention capacity of the company and brings about several outcomes that would not have appeared without focusing on Frauenthal Automotive Toruń absorptive capacity. Moreover, in an attempt to identify the routines and best practices regarding the company's absorptive capacity contributing to its growth and success in the field of innovativeness, we confirmed the relationship between the concept of absorptive capacity and open innovation. Through purposive inflows of knowledge the company not only develops its absorptive capacity and generates valuable outcomes, but also implements the idea of open innovation. It is indisputable that nowadays innovations are stimulated and created through purposive combining the knowledge from outside the company with its own knowledge resources. Thus, the company aimed at increasing its capacity to be innovative and competitive has to concentrate on opening up its boundaries both to purposive knowledge inflows and outflows. The desire to remain competitive motivates Frauenthal Automotive Toruń to absorb new external knowledge but on the other hand to share some knowledge outcomes with several entities in company's environment. Our study provided insight into bilateral relationship between the enhancement of enterprise absorptive capacity and its experience concerning open innovation approach.

We have done our best to ensure the high quality of the study. Nevertheless, we are aware of its limitations. First of all, the single case study analysis is a method of exploratory nature which results are limited as regards any generalization. The specific characteristics of the company under the study, the industry it operates and the leader position the company occupies in the market may have an impact on any attempts to generalize our findings and "translate" them in a different context. Secondly, a limited sample of respondents and interviewees should be considered as a limitation. Having knowledge of inter-organizational learning processes occurring between

Frauenthal Automotive Toruń and its partners was the key factor for selection of the research sample within the unit of analysis. Therefore, taking into account the level of company employment (around 150 people) the number of informants was naturally limited. Thirdly, the research attention was focused on the company, while relative absorptive capacity based on the "learning dyads" (cf. Lane & Lubatkin, 1998) including the studied company and its partners was nearly mentioned.

Finally, we are aware that our study is only one small step to explore thoroughly the issues of absorptive capacity and its relationships with open innovations, firm growth and competitive advantage. It would be interesting to broaden the analysis through interrelation between the activities undertaken by firms while implementing the open innovation approach and to emphasize on firm absorptive capacity development. Among implications of our study and the issues inspiring for further research we point out the issue of motivating employees to engage in the activities of all absorptive capacity process stages. We assume that remaining an innovative and competitive market actor implies the need to search for particular conditions that strongly influence employees attitudes towards innovations and their pro-innovative behaviors in the context of the firm's absorptive capacity. Such knowledge enables the executives intentionally create the conditions favourable for their success in the field of acquiring, transforming, and exploiting new external knowledge.

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Abstrakt (in Polish)

Celem artykułu jest dokonanie analizy roli i znaczenia zdolności organizacji do absorpcji wiedzy zewnętrznej dla wzrostu przedsiębiorstwa i budowania jego przewagi konkurencyjnej poprzez innowacje. Przypadek przedsiębiorstwa Frauenthal Automotive Toruń został wykorzystany do zbadania w jaki sposób działania i dobre praktyki związane ze zdolnością organizacji do absorpcji wiedzy zewnętrznej wpływają na jej wzrost i sukces biznesowy. W wyniku operacjonalizacji celu głównego określono trzy cele szczegółowe: (1) zidentyfikowanie we Frauenthal Automotive Toruń doświadczeń i dobrych praktyk w zakresie procesów absorpcji wiedzy zewnętrznej; (2) dokonanie analizy relacji pomiędzy koncepcjami zdolności organizacji do absorpcji wiedzy zewnętrznej i otwartych innowacji; (3) wskazanie i dokonanie analizy przykładów wykorzystania przez Frauenthal Automotive Toruń zdolności do absorpcji wiedzy zewnętrznej w celu tworzenia innowacji, rozwoju i wzrostu przedsiębiorstwa oraz jego przewagi konkurencyjnej.

Słowa kluczowe: *zdolność organizacji do absorpcji wiedzy zewnętrznej, otwarte innowacje, wzrost przedsiębiorstwa, przewaga konkurencyjna.*

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In What to Invest after Surviving – the Investment Structure of Growing SMEs

Urban Pauli[1]

Abstract

The main goal of the article is to present the research testing a model of investment structure in different phases of SMEs' growth. The author assumed that the share and structure of investments vary in accordance with the stage of the company's growth, and it is possible to describe the path which SMEs follow in their development. In the study based on organizations' growth models, demand for particular resources in subsequent growth stages is presented. The model and investments structure is verified on a sample of 286 SMEs.

Keywords: *small and medium enterprises, organizations growth, investments, resources, performance indicators.*

Introduction

The process of a firm's growth is never easy and it requires both knowledge and determination of the founder. Because of their potential and limited resources small and medium enterprises (SMEs) have to pay more attention to the use of their capabilities while planning activities that lead to achieving desired goals and success (Sheehan, 2013; Pauli, 2014). Since the early 70's many theories describing organization growth have been developed. Most of them apply the analogy to the life cycle and compare the way organizations change with the stages between birth and death. The main aim of the studies focused on organizations' growth is to provide entrepreneurs with information helping them to succeed in their ventures. However, according to McMahon (1998) most of the theories provide researchers and policy-makers only with information that makes it possible to choose between imperfect means for describing or characterizing SMEs growth.

There are many theories concerning the characteristics of subsequent stages of organizations' growth (for example Jackson & Morgan, 1982; Churchil & Lewis, 1983; Mintzberg, 1984; Scott & Bruce, 1987; Hanks,

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Watson, Jansen & Chandler, 1993; Miller & Friessen, 2014) and they differ in accordance with the number of stages and their specification. Despite the fact that many authors conduct research in the field of organizations' growth there is a limited number of publications that help entrepreneurs find the way they should act. Examples of such research are Greiner (1984), Adizes (2004), Quinn and Cameron (1984) and Flamholtz (1995). Greiner identified threats that can be both a constraint in the growth and an impulse for revolutionary changes in the way organizations act. Adizes described roles an entrepreneur should play in every growth stage. Quinn and Cameron as well as Flamholtz focused their research on sources of effectiveness. They described areas crucial for development. Although the studies show certain key factors or actions leading to success none of them presents how SMEs may prepare for potential threats or for using opportunities.

This paper presents the results of the research aimed at verifying theoretical model describing the structure of investments in resources that SMEs should implement in order to improve performance. To accomplish the main goal, the following partial aims were defined: (1) identification of the requirements for particular resources at subsequent stages of SMEs growth on the basis of literature study, (2) conducting empirical data analyses to find the structure of investments at defined stages, (3) verification of the relationship between investments structure and performance indicators.

In the first part of this article, the importance of particular resources in achieving success is presented on the basis of resource based view of the firm (RBV). It is followed by an analysis of organizations' growth theories and summarized in the section presenting demands for resources in particular growth stages and describing potential investment areas.

In the second part of the article a theoretical model as well as hypotheses are presented. It is followed by the sample description and data analyses. Main findings and conclusions are included in the last part of the article.

Literature review

The role of intangible assets in innovation and firm growth

Companies, while running their businesses have to use resources enabling them to produce their goods or provide services. The structure of required resources can be dependent on the branch firms operate in, but even in the same branch the structure or the value of resources used may differ. Moreover, among companies that use very similar resources some may succeed while others fail. A foundation for explaining such a paradox is resource based view of the firm (RBV) developed by Barney (1991). According to this view the

resources are "assets, capabilities, organizational processes, firm attributes, information and knowledge … that firms use to implement their strategies" (Barney, 1991, p. 101). These resources can be divided into three categories (1) physical capital, (2) human capital and (3) organisational capital. Physical capital consists of such elements as technology, plant, equipment, location, access to raw materials. Human capital are knowledge, skills, attitudes, and abilities employees have. Organisational capital consists of structural solutions, internal systems, communication, as well as relationships employees create in the workplace or with stakeholders outside the organisation. According to RBV companies may build their sustained competitive advantage by using these resources only when they are valuable, rare, inimitable and nonsubstitutable (VRIN) (Barney, 1991).

On the basis of RBV, Galbreath (2005) conducted research aimed at identifying which resources are most important for companies. In the theoretical framework of the study he defined resources as "firm-level factors that have the potential to contribute to economic benefits" (Galbreath, 2005, p. 980) that can be divided into three main categories (1) tangible resources, (2) intangible resources that are assets and (3) intangible resources that are capabilities. Tangible resources contain physical assets and financial assets, and their value is presented in the companies' balance sheet. Intangible assets correspond to Barney's organisational capital because they include (a) intellectual property assets, (b) organizational assets and (c) reputational assets. Intellectual property assets are patents, trademarks and copyrights as well as technology developed to fit the strategy. Organizational assets refer to culture, structure and internal systems as well as processes, which, because of the difficulties in duplicating them, may be characterised by VRIN attributes (Galbreath, 2005, p. 981). Reputational assets are originated in relationships the firm has with its suppliers, customers and business partners. Capabilities refer to what the firm '*does'*, and are defined as a capacity to make use of a company's assets in order to reach a higher level of performance (Maritan, 2001, p. 514). Capabilities are skills and accumulated knowledge that are the foundation of organizational routines (Galbreath, 2005, p. 979). These routines, having a strategic aspect, let organisations achieve new resource configuration when changes on the markets occur. They can integrate, restructure and release resources providing high level of adaptability (Eisenhrdt & Martin, 2000, p. 1107). Capabilities stem from organizational practices and are crucial for achieving strategic goals, and they result from actions taken by people, organization's history and stakeholders' activity (Kostova & Roth, 1999). On the basis of such a categorization that divides resources into tangible assets and intangible resources (both assets and capabilities) Galbreath hypothesized that *intellectual property*

assets, *organizational assets* as well as *reputational assets* contribute more significantly to the firm's success than *tangible assets*. Moreover, *organisational capabilities* have the greatest impact on the firm's success (Galbreath, 2005, pp. 981 – 982). Those hypotheses were supported in the research.

Similarly to Galbreath (2005), Pike, Roos and Marr (2005) on the basis of literature study concluded that factors building organizations' potential may originate from: *human capital, organisational capital, relational capital* and *physical* as well *monetary assets*. Human capital includes knowledge, skills, motivation, abilities and attitudes of employees. They are crucial for fulfilling tasks on job positions, and because of their unique configuration cannot be imitated. Organizational capital consists of organizational culture, implemented strategies, structures, and intellectual property. Relational capital includes relations with customers, suppliers, subcontractors, business partners as well as with external experts. Physical assets consist of materials, equipment, land and buildings. The last category of resources (monetary) "are all financial assets that can be converted into cash" (Pike et al., 2005, p. 113). On the basis of conducted case studies Pike et al. (2005) proved the importance of intangible assets in the value creation process.

On the basis of RBV it can be concluded that SMEs' success may stem from appropriate use of resources that are both tangible and intangible. Because it is impossible to have an access to all potentially required resources there is a need to identify which of them can be crucial at a given time. The demand for particular resources may refer to the stage of organizations' growth.

Organizations' growth theory

All theories concerning organizational growth tend to emphasize changes that appear in particular areas of firms' functioning while shifting from one stage to another. One of the most frequently discussed models of SMEs' growth that directly refers to SMEs is the one developed by Churchill and Lewis (1983). The authors created a model consisting of five main stages: *existence, survival, success, take-off* and *resource maturity*. The features by which each stage can be characterised are: the managerial style, organizational structure, extent of formality, major strategic goals and owner's involvement in business. According to the model, SMEs change from small, owner-driven, informal and unstructured systems, into complex, and formalized organizations managed by professionals.

Scott and Bruce's (1987) model consists of five stages that are: *inception, survival, growth, expansion* and *maturity*. The characteristics of organizations in each stage are very similar to those created by Churchill and Lewis, but

Scott and Bruce added descriptions of possible crises that may appear between particular stages and are connected with changes which have to be made. These changes require particular resources which will be discussed in the following section.

Crises as a driving force for innovation and growth were also the foundation of Greiner's model (1998). In this model five stages of evolutionary development were described that are: *creativity, direction, delegation, coordination* and *collaboration.* A switch between particular stages of evolutionary development is caused by crises connected with impossibility to manage the business in the same way. These crises can result in both accelerated development (described as a revolutionary growth) or as a constraint to further growth. As long as the organisation possesses resources required for rapid changes it can benefit from immediate changes, and achieve higher market level. The lack of required resources may cause that reaching the subsequent stage of evolutionary growth will be very difficult or even impossible.

In the model of Hanks et al. (1993) four main and two additional stages were described. Moreover, the authors listed main goals that should be reached in every stage to enable further growth. In the *start-up* stage the main goal is to develop products or services. Organisations in the next stage, *expansion,* aim at enlarging markets for their products and services. Firms in the *maturity* stage should concentrate on internal processes and procedures. In the last stage, *diversification,* organisations search for new markets and launch new products or services. These four stages describe the path of incremental growth of organisations, if they succeed in preceding stages.

Miller and Friessen (2014) conducted research aimed at finding differences between main features of organizations in particular stages of growth. In the model they investigated a five stages approach. Their analyses of the model that consists of: *birth, growth, maturity, revival* and *decline* stages, aimed at finding and describing differences that appeared in four main dimensions that impact performance, such as: *strategy, situation, structure* and *decision making style.*

Quinn and Cameron (1983) created a model of organizational growth that focuses on effectiveness. They characterized four main stages of organizational development that are *entrepreneurship, collectivity, formalization and control,* and *elaboration of structure*. In each of these stages, organizational effectiveness stems from different configurations of four models: *human relation, open systems, internal process* and *rational growth.* Each of these models refers to a different type of resources and their configuration. That is why, companies should develop the resources that are crucial for reaching effectiveness in subsequent stages.

Key factors that affect performance were the foundation of Flamholtz (1995) model. On the basis of his study he identified six crucial components that are: *identification of market segment or niche, (2) development of products and services, (3) acquiring resources, (4) development of operational systems, (5) development of management systems,* and *(6) developing corporate culture.* A success or proficiency in these activities has a positive impact on the firm's performance, which was proved in the later study of Flamholtz and Aksehirli (2000). Moreover, regardless of the growth stage, managers should focus on all of the "*building blocks"* interdependently, but according to the authors some of them might be more important than others in a particular stage of growth.

Investment areas

All of these models assume that changes in companies' existence require changes both in internal systems and in the way they act on the market. While introducing such changes companies must use their resources in order to take advantage of emerging opportunities and prevent potential threats. On the basis of RBV (Barney, 1991) and the research conducted by Galbreath (2005) and Pike et al. (2005), resources are divided into five main categories: Human capital (HC), Organisational capital (OC), Relational Capital (RC), Tangible assets (TA), Financial assets (FA).

On the basis of organisation's growth theories the requirements for resources in particular growth stages can be identified. They are summarized in Table 1.

Table 1. The requirements for resources on growth stages

Stage	Resources requirements
	Churchil and Lewis (1983)
Existence	HC (owners abilities), FA, TA (plants),
Survival	HC (owners abilities), FA, TA (plants)
Success	OC (internal systems), HC (owners abilities, employees' competencies)
Take-off	OC (internal systems, planning), HC (employees' competencies), RC
Maturity	HC (employees' competencies), RC, TA (if aiming at new markets)
	Quinn and Cameron (1983)
Entrepreneurial	RC, FA – most important are resources acquisition and external support
Collectivity	HC, RC – building external relationships, enhancing employees' commitment and cooperation
Formalization and control	OC, FA, TA, RC – the main goal is to create stable environment for internal changes and development

Elaboration of structure	OC, HC, TA, RC – the main goal is to enhance performance, create optimized internal procedures and prevent organisation against external threats
	Scott and Bruce (1987)
Inception	FA, OC (formalization of basic processes), HC (ability to run and manage activities)
Survival	OC (to cope with high dynamics in sales, internal and external communication systems), RC (widening distribution channels)
Growth	HC (need to develop new products or enter new markets), TA (to cope with increasing sales level),
Expansion	RC (building distribution channels on new markets, analysing customers' needs and responding to them), OC (information flow, management systems), HC (managing all processes and business areas)
Maturity	OC (managing systems), RC (searching for the opportunities to grow)
	Hanks et al. (1993)
Start-up	HC, FA, TA – main goal to develop products and services
Expansion	RC – main goal is to enlarge markets; OC – introducing organisational structure and managing systems
Maturity	OC – developing internal processes with accordance to the scale and scope of activities; HC – to manage and to fulfil specialized tasks
Diversification	HC – developing new products and services, RC – searching for new products, TA – launching new production lines
	Greiner (1998)
Creativity	TA (creating products and services), FA (searching for customers, producing), HC (owners competences)
Direction	OC (introducing managerial systems), HC (employing managers)
Delegation	OC (changes in structure, delegating power), HC (need to cope with a more complex activity), RC (extending markets and products range)
Coordination	OC (introducing performance management systems, reconfiguring structures), HC (a need for team work, focus on internal functions), RC (collecting data from the market, demand analyses)
Collaboration	HC (introducing new working standards, team work), RC (building new alliances, analysing customers' needs)
	Flamholtz and Aksehirli (2000)
New venture	FA, TA, RC – critical development area are markets and products
Expansion	OC, HC, FA - critical development area are operational systems
Professionali-zation	OC, HC - critical development area are management products
Consolidation	OC, RC, HC - critical development area is corporate culture
Diversification	FA, TA, HC, RC - critical development area are markets and products
Integration	FA, OC, HC - critical development area are – operational systems, management systems, organisational culture
Decline	FA, RC, HC – all critical development areas are crucial and there is a need to renew the firm .

Source: Churchill and Lewis (1983), Quinn and Cameron (1983), Scott and Bruce (1987), Hanks et al. (1993), Greiner (1998), Flamholtz and Aksehirli (2000).

In presented models of organizations' growth requirements for particular resources are indicated. Because these resources can be used by SMEs in order to achieve desired goals, SMEs may invest in them. There is no unanimous structure of such resources. The importance of each of them in a particular stage of growth has not been indicated. The only conclusion that can be drawn is that financial as well as tangible assets are very important in the initial and late stages. It is caused by a necessity to create new or modify existing products which requires both finance and plants, machinery and other assets. In the middle phases intangible assets that consist of human capital, organizational capital and relational capital tend to be most important.

Research methods

Theoretical model and hypotheses

On the basis of organization growth models and RBV a general model of SMEs investments can be developed (see Figure 1).

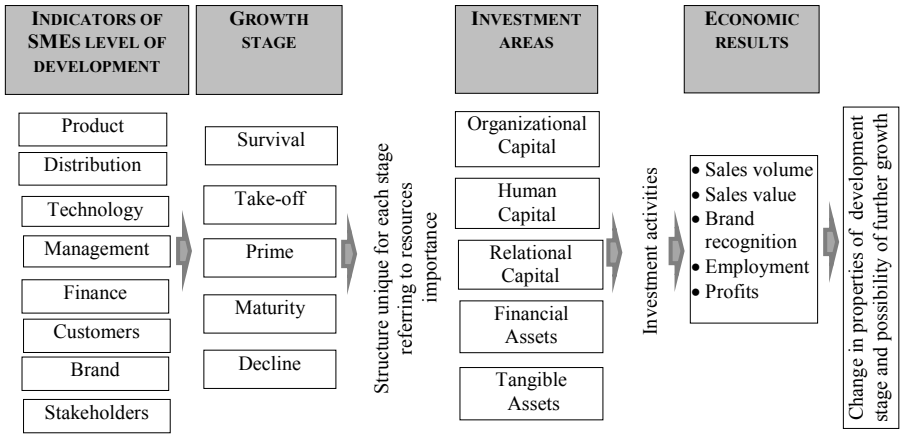

Figure 1. Theoretical model

According to the model SMEs' lifecycle can be divided into five main stages that can be characterised taking into account the following aspects (a) products and services, (b) distribution channels, (c) technology used and its origin, (d) management systems, (e) sources of financing and policies, (f) number of customers and relationships with them, (g) brand recognition and SMEs image, (h) types and number of other stakeholders. The specification of such components will indicate at which level of growth the organization is. The proposed stages are based on literature study and correspond mostly

to the Churchill and Lewis as well as Scott and Bruce models. It should be mentioned that these two models do not include *decline* stage and, the first stage presented in both models (*inception* or *existence*) can be defined also as survival. Thus, in the theoretical model the following five stages were included:

- Survival – low market share, no regular customers, financed by owner's capital, narrow offer,
- Take off – products meet expectations, increasing incomes, widening internal processes, brand recognition in some groups,
- Prime – increasing market share and incomes, developing and widening products, good brand recognition, new technological solutions, management systems,
- Maturity – high incomes, higher costs, well designed management systems, well recognized brand, well designed cooperation with stakeholders,
- Decline – decreasing incomes, market share and number of customers.

In each of these stages companies may invest in resources that are divided into five main categories (1) tangible assets, (2) financial assets, (3) organizational capital, (4) human capital, (5) relational capital. These investments should result in increasing the effectiveness of SMEs. Effectiveness can be evaluated by the means of performance indicators that are for example sales volume, sales value, brand recognition, profits, employment. Moreover, appropriate investments should result in achieving expected level of return on investments (ROI) that can be calculated by dividing total profits by total expenditures on investments.

On the basis of literature study and the developed model some implications for SMEs management can be drawn. Because in subsequent growth stages SMEs characteristics differ it can be stated that the share and value of investments in resources should be different and should correspond to requirements and identified gaps. It can be hypothesized that:

H1: the structure of investments in resources differ in particular stages of growth

Because investment decisions are not easy and their quality depends on the experience and knowledge of the founder as well as on environmental impact, it can be stated that even in a particular growth stage the structure of investments differs. The share of investments in particular areas may impact the ROI rate and performance indicators. Then it can be hypothesized that:

H2a: The structure of investments in a particular growth stage impacts the ROI level

H2b: The structure of investments in a particular growth stage impacts SMEs performance

According to RBV companies are more likely to achieve competitive advantage if they use resources that can be characterised by VRIN attributes. Of all the resources companies may use, those referring to relational, organizational or human capital are more likely to provide organisations with a possibility to achieve competitive advantage because they are difficult to imitate. Then it can be hypothesized that:

H3: SMEs that have a higher share of investments in intangible assets in total investments achieve higher performance

Such measures as: (1) service sales value, (2) products sales value, (3) service sales amount, (4) products sales amount, (5) profits, (6) number of customers, (7) number of employees, (8) general economic condition, (9) brand recognition can be used as key performance indicators (KPI).

Sample

The research was conducted in April-May 2014 and 2015 on a group of 470 SMEs operating in Poland. They were selected randomly from the database that consists of 1950 units. The study was conducted with the use of PAPI technique and the owners or managers were interviewed. After receiving all the questionnaires they were screened in order to find out if they were filled appropriately and if all the data required for analyses were provided. Unfortunately, not all respondents provided data concerning investment expenditures or profits, which caused that in further analyses only 286 SMEs were taken into account. General characteristics of the sample are presented in Table 2.

Table 2. Sample characteristics

Characteristic	Share in percent*
Profile	
Production	29,37
Services	63,29
Selling	28,32
Operating market	
Local	40,56
Regional	30,77
Country	22,72
International	15,38
Stage of growth	
Survival	21,32
Take-off	13,63

Characteristic	Share in percent*
Prime	18,18
Maturity	21,33
Decline	25,52
Age	
0-3 years	4,20
3-5 years	9,44
5-8 years	15,73
9-12 years	13,99
13-16 years	12,94
More than 16 years	41,61

* Shares of 'profiles' and 'operating markets' do not sum up to 100% because some firms declare that they have mixed profiles and operate on more than one market. Six firms did not provide information concerning age.

Analytical procedure

The first step in the analyses was to verify data and calculate ROI value on the basis of total investment expenditures and profits. Failing to provide certain data limited the database to 286 enterprises. The next step was to evaluate the growth stage. In the questionnaire, on the basis of literature study, some indicators of the level of growth were introduced. Respondents were asked to choose from a given range of answers the one that was the most appropriate to describe their enterprise. Indicators were connected with (a) products and services, (b) distribution channels, (c) technology used and its origin, (d) management systems, (e) sources of financing and policies, (f) number of customers and relationships with them, (g) brand recognition and SMEs image, (h) types and number of other stakeholders. For each indicator three to six questions were asked, giving a possibility to choose answers corresponding to the particular stage of growth. Provided options to choose from were based on (1) formality/complexity (for example in the 'management system' area the scope of answers to the question concerning job description was from 'we do not have job description or tasks specifications' to 'we have detailed job descriptions, formalized functional relationships, and listed tasks executed while fulfilling roles'), (2) quantity (for example number of introduced innovations, range of products and services, number of distribution channels and facilities for customers), (3) relationships with stakeholders (for example share of occasional and regular customers, stability in cooperation with suppliers and subcontractors, involvement in CSR activities and cooperation with partners). On the basis of the answers the methods of grouping objects such as Ward analysis

and a k-*means* clustering method were used to divide the companies into homogeneous groups in relation to a given feature (Hartigan & Wong, 1979). These methods were used because the questionnaire consisted of thirty two questions with four to eight options to choose from. Having such a variety of possible combinations it was necessary to group companies taking into account similarities in particular areas. *K-means* clustering enabled to group companies that are not identical but on the basis of means of given data they can be categorized as homogeneous. These results of grouping SMEs into five stages of growth, and the share of the groups is presented in Table 2.

The next stage of analyses was aimed at verifying if there are differences between the structure of investments in particular growth stages between SMEs achieving high (1 and above) and low (below 1) level of ROI. In order to do it measures of structure and incidence were applied. The last stage was to verify if there is a correlation between the share of particular areas of investments (HC, OC, RC, TA, FA) and ROI level as well as between particular performance indicators. The KPIs were measured by the means of perceived changes. In the research five-grade scale was used in which particular values stood for: '1 – there was a huge decrease', '2 there was a decrease', '3 – remain stable', '4 – there was increase', '5 – there was a huge increase'.

Analysis

The structure of investments in investigated companies differs in accordance with the stage of growth and ROI level. Moreover, changes in the structure of investments tend to be more visible in companies that achieve higher level of ROI (see Figure 2). Companies in this group seem to follow general requirements developed on the basis of literature study.

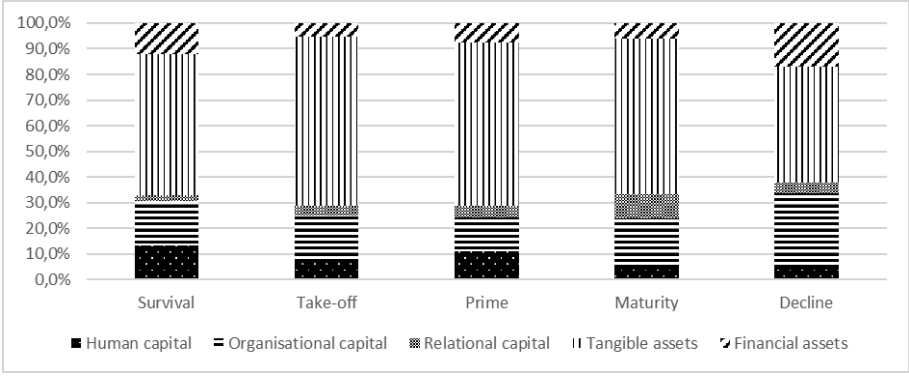

Figure 2. Structure of investments in companies with high level of ROI

Taking into account TA that have the highest share in total investments (up to 66% - see Table 3) it can be seen that they take more than a half of total expenditures in the survival stage. When products and services meet market expectations, SMEs need to increase the value of investments in tangible assets in order to enhance production or service potential (the take-off stage). Having developed production or service systems, companies may profit from these investments and do not have to invest in TA at the same level. It results in a decrease in the share of investments in TA in total investments. The highest decrease can be observed between the maturity and decline stage in which companies, in general, lose their innovativeness. They are more focused on internal procedures and systems and pay less attention to investments in new products and services.

The share of investments in OC directly corresponds to the scheme presented by the authors of organization growth models. In the beginning this share is at the level of 20 percent because SMEs have to invest in know-how and create internal systems. Once developed procedures and operational schemes can suit organizations until their size makes it impossible to cope with all managerial duties for the entrepreneur. According to growth theories such a situation may appear it the prime stage which is characterized by a rapid growth. As a result of such a growth new internal systems have to be introduced, which results in an increase in the share of investments in OC. The increase in the share of OC can be observed until the decline stage because growing and more complex organizations require more advanced procedures and schemes.

Investments in HC are at the level of 13 percent in the survival stage, and this is the highest share among all the stages of growth. Such investments in the beginning are connected with hiring new employees and conducting trainings aimed at achieving appropriate level of skills and knowledge that are required for fulfilling tasks. The share of investments in HC decreases in the take-off stage because there is no need to hire new employees or to develop their competences. In the prime stage, as market share increases and rapid growth can be observed, companies hire employees to meet the growing demand for their products and services. It results in the increase in investments in HC. In the subsequent stages as the market dynamics are not so high, and the company is less innovative, managers believe that there are no requirements for investing in HC.

Investments in RC are very low in all the stages of SMEs growth. In the beginning, as the company is very young and not recognized on the market, there are no areas in which it may invest in order to build relationships with stakeholders. In subsequent stages the share of investments in RC increases because SMEs pay more attention to their relations with customers, suppliers

and business partners. The highest share of investments in RC is in the maturity stage, when companies become well-recognized market players and are involved in many incentives oriented on customers as well as on business partners. Companies in this stage also become a member of associations or invest in CSR activities. In the maturity stage, because some financial problems may appear, investments in RC might be the first to cut off.

The share of investments in FA in the survival stage is at the level of 12 percent which can refer to the situation in which the owner tries to secure his/her cash-flow by investing in assets with high liquidity. In subsequent stages the share of investment in FA is very low which is the result of investing in other resources that can provide further growth. The share of investments in FA increases in the decline stage. It is connected mostly with a possibility to invest in the shares of other companies. Owners may also allocate short-term financial surplus, that results from gaining profits and unwillingness to invest in innovations, in financial assets with high liquidity.

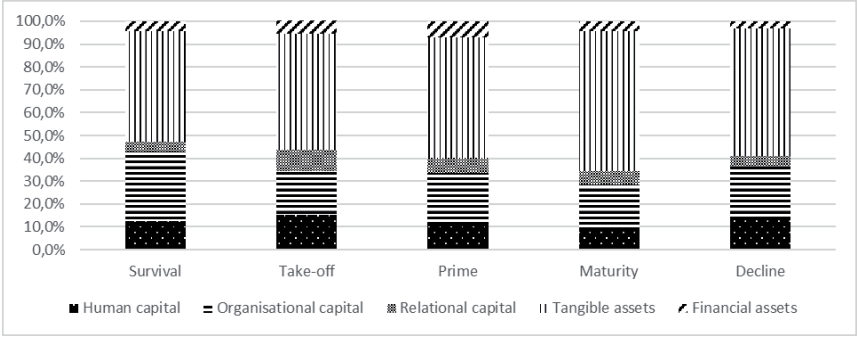

Figure 3. Structure of investments in companies with low level of ROI

The structure of investments in companies with a low level of ROI is different than in organisations with high level (see Figure 3). Although, similarly to companies with high level of ROI, TA and OC are the resources in which companies invest the most, there are no such dynamics in changes in the share. Starting from the take-off stage the share of investments in HC, RC, FA and OC in total investments seems to be at almost the same level as in all subsequent stages. Only in the case of TA an increase in the share of investments can be observed. It can result from investing in new machinery, equipment or buildings that are required for running the business. The highest increase in the share of investments in the TA is in the maturity stage, when companies have a good and stable market position. It seems that the owners follow the same investments schemes for all subsequent stages

and their growth does not result from planned activities but is rather the consequence of changes on the market to which they try to adapt. Such an approach causes that most investment decisions, can be inadequate or not as required as others, which results in lowering ROI and financial conditions of SME.

Table 3. The structure of investments in SMEs

	ROI Level	Survival	Take-Off	Prime	Maturity	Decline
Human capital	High	13,4%	7,2%	11,2%	5,0%	4,7%
	Low	12,6%	15,1%	12,1%	8,6%	13,4%
Organisational capital	High	17,4%	17,9%	13,0%	18,7%	29,1%
	Low	30,4%	19,1%	21,3%	20,1%	23,1%
Relational capital	High	2,3%	3,8%	4,4%	9,5%	4,1%
	Low	4,1%	9,6%	6,7%	5,8%	4,3%
Tangible assets	High	54,9%	65,9%	63,9%	60,9%	45,1%
	Low	48,7%	50,6%	52,6%	61,3%	55,9%
Financial assets	High	12,0%	5,3%	7,4%	6,0%	17,0%
	Low	4,2%	5,9%	7,2%	4,2%	3,2%

Analysing the correlation between investments in particular areas and performance indicators it can be observed that such a correlation appears mostly in the decline stage (see Table 4). What is more, it seems that not every resource has an impact on performance, so the structure of investments should differ.

In the survival stage there is a positive correlation between investments in TA and ROI level. The higher the share of TA investments the higher level of ROI is achieved. Investments in OC are negatively correlated with employment, which means that the more SMEs invest in OC the less likely they are to hire new employees. Changes in working conditions as well as introducing new procedures can positively impact efficiency, which helps companies achieve desired level of performance without hiring new workers. FA investments are negatively correlated with profits and financial condition. According to literature study SMEs in initial stages are financed mostly by the owners' capital and in order to survive they have to invest in other resources to build their competitive potential. That is why, the share of investments in FA negatively impacts these performance indicators.

Table 4. Correlation between investments structure and KPI

	Mean	S.D.	Share of investments in particular areas					Share of all intangibles
			HC	OC	RC	TA	FA	
Survival stage								
ROI	0,5470	0,9028	-0,0936	-0,2768	-0,0330	0,3104*	0,0462	-0,3224*
Profits	2,5000	0,9690	0,1519	-0,1812	-0,1129	0,2303	-0,3253*	-0,1028
Employment	2,5476	0,8323	-0,0048	-0,3580*	0,0748	0,2833	0,0548	-0,2990
Financial condition	2,7619	0,6917	-0,0222	-0,0211	-0,1463	0,2062	-0,3094*	-0,0851
Take-off stage								
Services sale (quantity)	3,0000	0,7845	-0,4354*	0,0759	-0,5750*	0,4367*	0,0000	-0,4504*
Services sale (value)	2,9259	0,8286	-0,3060	0,1591	-0,5406*	0,2976	0,0309	-0,3249
Number of customers	3,0741	0,9578	-0,0769	0,3943*	0,1486	-0,2288	-0,1449	0,3200
Decline stage								
ROI	1,2759	2,0797	-0,2063	0,2395	-0,1338	-0,2961*	0,3282*	0,1172
Products sale (quantity)	3,4444	0,8165	-0,0001	0,3004*	0,2257	-0,2915*	-0,0363	0,3034*
Services sale (quantity)	3,4444	0,7931	0,0799	0,3491*	0,1748	-0,3599*	-0,0373	0,3707*
Products sale (value)	3,4630	0,7942	0,0017	0,3449*	0,0981	-0,3092*	-0,0459	0,3258*
Services sale (value)	3,4630	0,7942	0,0639	0,4733*	0,0366	-0,4290*	-0,0724	0,4566*
Profits	3,3889	0,7115	-0,0096	0,3684*	-0,0415	-0,2715*	-0,1098	0,3225*
Number of customers	3,4444	0,7439	0,0435	0,4319*	0,2077	-0,3797*	-0,1254	0,4362*
Employment	3,2963	0,7172	0,1647	0,2099	0,1785	-0,1610	-0,2318	0,2784*
Financial condition	3,3333	0,6443	-0,0802	0,4200*	-0,1026	-0,2870*	-0,1012	0,3330*
Brand recognition	3,4444	0,6344	-0,0529	0,3305*	-0,1508	-0,1768	-0,1590	0,2558

*correlation with the p<0,05

In the take-off stage the share of investments in TA is positively correlated with the quantity of service sale. Investing in such resources makes it possible for organisations to provide their services to a wider range of customers and create potential for further growth. However, it seems that the market share

is not so high that SMEs should invest in HC (for example in trainings or hiring new employees) because investments in this area are negatively correlated with the service sale quantity. A positive correlation can be observed between the share of investments in OC and the number of customers. In this stage investments in OC refer to launching new distribution channels which can widen the number of potential clients. Investing in RC is negatively correlated with the service sale quantity and value. Companies in this stage have no brand recognition and are not treated as valuable business partners because of their overall performance. This may result in a situation in which investments in relations with customers, suppliers or business partners may not impact performance.

In the prime and maturity stage no correlation was found between the share of investments in particular resources and performance indicators.

In the decline stage the correlation between OC as well as TA and almost all KPIs is statistically proved. It should be mentioned that the share of investments in OC is positively correlated with eight out of nine KPIs while TA share is negatively correlated with seven out of nine KPIs. In the decline stage SMEs are well developed but in general they lose their market position. According to literature study, the most important challenge is to optimize internal processes because a number and scope of implemented procedures can cause a red tape crisis as well as an increase in general costs. That is why, investing in OC, aimed at downsizing and implementing more flexible systems, can result in the increase of KPIs. A negative correlation between KPIs and the share of investments in the TA can stem from the necessity to develop new products and services, or entering new markets, rather than from investing in assets that are required for maintaining current production or service schemes. Moreover, after the maturity stage many firms tend to invest in TA to build an image of a successful organization. This may result in making investment decisions that have no or little impact on performance.

There is no correlation between the share of investments in intangible assets (IA) and performance when taking into account the whole sample of investigated SMEs. On the basis of conducted analyses it can be proved that only in the case of companies in their decline phase, investments in IA are correlated with almost all performance indicators (except brand recognition). In the decline stage as well as maturity stage, SMEs are well developed and have a potential to produce goods or provide services. There is no need to invest in TA because companies in these stages achieve the desired level of productivity. That is why, investments in IA may mostly impact performance in these stages.

Discussion

On the basis of conducted analyses it can be stated that there is a difference between the share of investments in particular resources between SMEs that achieve high or low ROI level. The most important difference is in the dynamics of changes in particular investment areas in subsequent growth stages. Owners and managers that achieve high ROI level can be perceived as the ones who analyse the situation of their enterprises and act proactively or responsively in order to solve emerging challenges. The structure of investments corresponds to the theoretical model of the study. On the basis of organisational growth theories implications referring to the demand of particular resources in subsequent stages were developed. SMEs with high ROI tend to follow these directions. They spend most of their investments on TA but the share of such investments decrease after the take-off stage when companies have achieved the level of infrastructure that enabled them to produce or provide services. According to Barney (1991) such resources cannot build competitive advantage because they have no VRIN attributes. That is the reason why owners or managers may switch their investments' capital into other resources. Investing in OC, RC or HC may cause that they will be able to compete on markets and achieve desired goals. At the same time SMEs with low level of ROI can be perceived as the ones that follow the same investments scheme in all the stages. Although the share of particular investments area can change slightly major differences do not appear. It may stem from the owners'/managers' approach, according to which once made investing decision, that enabled SMEs survival, should be (or can be) appropriate in subsequent stages. Such an approach does not correspond with the demand for resources that emerge while SMEs are growing and can be caused by both internal as well as external changes (connected with the branch, competitors or customers' expectations). It can be concluded, that the first hypothesis that *the structure of investments in resources differ in particular stages of growth* is supported.

On the basis of conducted analyses it should be concluded that hypothesis *2a* is not supported. *The structure of investments in a particular growth stage* does not *impact the ROI level.* There is no correlation between the share of investments in particular resources and ROI level. Although on the basis of theoretical study the demand for specific resources can be identified and the share of investments in them may differ in accordance with the branch or SMEs profile.

According to the data, hypothesis *2b* is partly supported. *The structure of investments in a particular growth stage impacts SMEs performance* but it can be statistically proved only in the decline stage and for two resources – TA and OC. In the survival and take-off stage the share of investments

impact only a few KPIs and in the prime and maturity stage the correlation was not found. It can be then concluded that performance of a particular SME is mostly dependent on individual features connected with profile, type of goods or services, branch or market on which they operate. Only in the last stage of growth, when SMEs become more powerful and achieve desired market position some general scheme can be found.

Similarly, the third hypothesis is supported only for companies in the decline stage. *Higher share of investments in intangible assets in total investments impacts SMEs performance*. While achieving desired market position companies are more likely to build their competitive advantage on the basis of intangible assets, that can be characterised by VRIN attributes. In early stages of growth SMEs have to use other resources (mostly tangible ones) to survive and achieve market share and to build a potential for further growth.

Conclusion

The main goal of the article was to verify if there is a structure of investments in resources that provides SMEs with the desired ROI level and potential for further growth. Statistical analyses based on a sample of 286 Polish SMEs show that there is a significant difference between the share of investments among companies that were investigated. Those that achieve high level of ROI tend to differentiate the share of investments in particular resources in subsequent stages. SMEs with low level of ROI maintain similar structure of investments in each stage. Lack of analyses of demands for resources can result in lowering not only the ROI level but also the performance of SMEs and their potential for further growth. Such analyses were conducted among SMEs that operate in Poland but conclusions seem to be relevant for other countries as well. Such an assumption stems from the similarity of the Polish market and other (especially) European markets, and what is more, business profiles of investigated SMEs are also present in other countries.

Despite the fact that the structure of investments differs no correlation between the share of investments in particular resources and KPIs was found in survival, take-off, prime and maturity stage. Such a correlation was statistically supported in the decline stage. It was found that in this stage OC as well as overall investments in tangible assets impact almost all KPIs. Moreover, the share of investments in TA is negatively correlated with these indicators.

On the basis of conducted literature study as well as statistical analyses it can be concluded that organisations' growth theories give clear directions to owners/manager in what they should invest in a particular stage of growth.

Following such directions enables reaching desired market position, adequate performance and creates the potential for further growth.

Despite the fact that such conclusions were made this study has several limitations. First of all it should be mentioned that all the information was gathered during interviews with managers or owners of SMEs and referred only to the data included in financial statements for 2013 or 2014. Analysing the impact of investments on performance and growth makes it necessary to compare the collected data with those referring to a longer period of time. Moreover, taking into account the total number of existing SMEs the sample of 286 companies is relatively small. What is more, these companies represent different branches and sizes (although by definition all belong to the group of small or medium enterprises). This may cause some biases because in some branches connected with production the impact of particular resources on performance and growth can be totally different than in companies that offer services. On the basis of conducted statistical analyses it can be stated that further studies should aim at building econometric model describing the most appropriate structure of investments at particular stages. However, because of the diversity and number of branches SMEs operate in, it might be necessary to narrow the sample only to chosen ones or to increase the number of SMEs investigated.

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Abstrakt (in Polish)

Głównym celem artykułu jest przedstawienie wyników badań ukierunkowanych na weryfikację modelu teoretycznego opisującego strukturę inwestycji rozwojowych małych i średnich przedsiębiorstw. Zgodnie z przyjętymi przez autora założeniami, struktura inwestycji różni się w zależności od fazy rozwoju MSP, a właściwie ulokowanie inwestycji wspiera rozwój i umożliwia osiągnięcie lepszych efektów biznesowych. W artykule analizie poddano główne modele rozwoju organizacji, co umożliwiło wskazanie zasobów mających kluczowe znaczenie na poszczególnych etapach rozwoju przedsiębiorstwa. Opracowany model został zweryfikowany na podstawie wyników badań przeprowadzonych wśród 286 MSP.

Słowa kluczowe: *małe i średnie przedsiębiorstwa, rozwój organizacji, inwestycje, zasoby, efektywność organizacji.*

Biographical note

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External Determinants of the Development of Small And Medium-Sized Enterprises – Empirical Analysis

Renata Lisowska[1]

Abstract

The paper aims to identify external determinants of the development of small and medium-sized enterprises and assess their impact on the functioning of these entities in Poland. Meeting this objective required: identifying determinants of the development of SMEs, determining the current development situation of the surveyed enterprises and examining the impact of external determinants on the development of SMEs. The implementation of the above-presented goals was based on the following assumptions: (i) the current situation of the surveyed enterprises is determined with the use of quantitative indicators (turnover volume, number of employees, market share, profit levels) (ii) the analysis of external determinants encompasses three components of the environment: the macro-environment, the meso-environment and the micro-environment, (iii) in each analysed area there are separate analyses conducted for micro, small and medium-sized enterprises, enabling greater precision in the identification of external determinants of development for each category of businesses.

Keywords: *SME's development, determinants of SME's development, macro-environment, meso-environment, micro-environment.*

Introduction

The terms “growth” and “development” of the enterprise are used interchangeably in the national as well as international literature. These terms are not synonyms though but rather complementary concepts. The enterprise's growth refers to quantitative changes (e.g.: an increase in turnover, employment, market share), while its development refers to qualitative changes (e.g.: the introduction of innovation, the ability to adapt to customer needs, etc.). Growth is therefore regarded as essential to the enterprise's development (Lisowska, 2013, p. 67). The development means coordinated changes of the enterprise's systems, adapting the company to

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a constantly changing environment so that it could survive in the market. This means: (i) introducing new elements into the enterprise's system, (ii) improving the quality of existing system elements, (iii) changing the structure of the systems (Pierścionek, 1998, pp. 11-15). According to B. Kaczmarek and Cz. Sikorski (1995, p. 225), the development is a holistic, long-term process of a strategic nature for the enterprise, based on changes. The changes are primarily aimed at individual elements of the organisational system and the method of implementation of particular management functions.

The literature indicates the existence of two theoretical approaches: growth theories and organisational development theories, which play an important role in the conceptualisation of the concept of the enterprise's development. Growth theories identify and analyse the impact of various factors on the increase in the size of the enterprise, also taking into account qualitative factors, whereas organisational development theories place the main emphasis on qualitative criteria, using knowledge of organisational behaviour (e.g.: personal relationships, structural solutions in the area of organisation and work processes, relationships between the organisation and the environment) for the improvement of the enterprise (Matejun, 2015, pp. 27-27).

T. Egan, based on 27 analyses of the definition of the organisational development, points out that the concept of enterprise's development is associated with (Egan, 2002, after: Matejun 2015, p. 28): (i) organisational renewal, (ii) change in the organisational culture, (iii) facilitating the acquisition of information and learning in the organisation, (iv) strengthening the system and improving processes, (v) planning and implementing of organisational changes, (vi) support in solving problems.

Therefore, the nature of the enterprise's development is related to changes in the status quo over time (Machaczka, 1998; Masurel & Mantfort, 2006; Steffens, Davidson & Fitzsimmonts, 2009). The character of the development can be deliberate or accidental, progressive or reactionary, spontaneous or forced, continuous or stepwise (Machaczka, 1998; Bławat, 2004). It can involve the whole enterprise as well as its areas – economic, organisational, information, technical, production (Stabryła, 2000, p. 9), marketing, behavioural and financial ones (Sysko-Romańczuk 2005, p. 55), and it can relate to the changes occurring under the influence of the environment.

S. Sysko-Romańczuk (2005, pp. 52) defines the concept of the enterprise's development referring to three approaches: cause-related, effect-related and function-related. Based on the cause-related approach, the incentive for development is the development gap (the difference between the desired state, i.e. existing capabilities, and the real state – the actual achievements),

which is identified through the strategic determination of achievable capabilities not utilised by the enterprise so far (Matejun 2015, p. 29). The effect-related approach treats the development as a result of development processes often described as having a competitive advantage (the market position which at a certain time enables the enterprise to generate significant surplus of value over the cost of obtaining this advantage) and the enterprise's innovativeness (related, among others, to the introduction of product, process, marketing and organisational innovations). In the function-related approach, the enterprise's development means improving the areas of its operation (e.g.: changes in the enterprise's systems by introducing new elements, improving quality of existing ones, changing the structure of these systems, etc.) and the position it occupies in the environment (e.g.: changes in the enterprise's position compared to its competitors) (Sysko-Romańczuk, 2005, pp. 52-53).

The theoretical framework for the analysis of the development of small and medium-sized enterprises is provided by numerous staged growth/development models described in the literature (e.g.: Greiner 1972, Adiezs,1989; Churchill and Lewis, 1983; Quinn and Cameron, 1983, Machaczka, 1998; Dodge and Robbins, 1992; Scott and Bruce, 1987; Storey, 1994; Gib and Davies, 1990). However, most of them relate to large enterprises, which does not always mean the possibility of their use in small and medium-sized enterprises. To identify determinants of the development of small and medium-sized enterprises, the model provided by L.E. Greiner (1972), in which the enterprise's development consists of occurring alternately processes of evolution and revolution, considered in terms of the company's age, size and rate of growth of the industry in which it operates, has proved to be important (Urbanowska-Sojkin, 2003; Machaczka & Machaczka, 2011). The life cycle of an organisation in this model consists of five stages, each of which ends with the so-called revolution which is a response to an emerging crisis. The enterprise grows until a crisis emerges and is overcome, which allows its further development (Greiner,1972). The first stage is growth through creativity – the creation and growth of the organisation are made possible through innovation and creativity of entrepreneurs. This stage ends with the emergence of the leadership crisis, which is related to the loss of management control over the growing volume of business and the size of the organisation (Greiner, 1972; Machaczka & Machaczka, 2011; Zelek, 2003). The second stage is growth through formalisation which encompasses duties and powers at different levels of the organisational hierarchy. The enterprise's growth is achieved mainly by improving its organisational structure and expanding its management system. This stage ends with the crisis of autonomy. The next stage is growth through the delegation of authority,

which is characterised by a transfer of competences and responsibilities to managers at lower levels (Greiner, 1972; Machaczka, 1998; Wieczerzyńska, 2009). This stage ends with the crisis of decentralisation, which necessitates the restriction of the autonomy at lower management levels. The fourth stage – growth through coordination – leads to synchronising the actions of the organisational units in one direction (e.g.: product or project-oriented groups are created). The enterprise's growth results from improving its policies as well as the introduction of modifications to its organisational structure. Expansion of the system can lead to the crisis of bureaucracy consisting in reducing the effectiveness of functioning of large organisations due to their tendency towards bureaucracy. The last stage is growth through cooperation, in which employees should be co-responsible for the organisation (Greiner, 1972; Wieczerzyńska, 2009; Machaczka & Machaczka, 2011). This has an impact on the development of commitment and effectiveness in achieving the enterprise's objectives. The continuation of the concept presented by L.E Greiner is the model provided by N. Churchill and V. Lewis (1983) as well as the model formulated by M. Scott and B. Bruce (1987). These models differ only in the scope of the areas analysed. In the model presented by N. Churchill and V. Lewis (1983), the enterprise's development is determined by factors related to the company's resources (financial, personnel, system, business ones) and the characteristics of the owner (the owner's motivation, ability to act, management skills and strategic capabilities) (Machaczka,1998). In the model provided by M. Scott and B. Bruce, the following elements are analysed at each stage of development: the degree of the industry's development, key issues for the enterprise, the role of the entrepreneur, the management style, the organisational structure, the enterprise's systems and control mechanisms, sources of funding as well as the range of products and channels of distribution (Masurel & Montfort, 2006; Roomi, 2009). The presented staged models have many supporters and opponents. They explain the differences between enterprises at different stages of development but are criticised for their small degree of suitability for the analysis of external determinants of business development (Wasilczuk, 2005).

In numerous papers (e.g.: Gibb & Davies 1990; North & Smallbone 1993; Storey 1994; Davidson & Wiklund, 2000; Fisher & Reuber, 2003), a great deal of space is devoted to growth theories, classified by J. Wasilczuk (2005, p. 25) into the following approaches: resources-based, personnel-based, strategic, referring to the environment, integrated and based on the life cycle of the enterprise. In the resources-based approach, most theories explaining the enterprise's growth refer to company resources, mainly financial capital and human capital. The personnel-based approach analyses the factors related to the person of the owner or manager, such as age, education, gender,

experience, motivation, personality and temperament. Another approach – the strategic one – refers to the process of formulating a strategy and the management style as the enterprise's growth factors. The approach referring to the environment places the main emphasis on the elements of the environment that shape the growth and development of the enterprise. The integrated approach provides a broader view of the enterprise's growth as growth theories are based on more than one of the aforementioned approaches. The last approach focuses on the analysis of the life cycle of the enterprise in which growth theories relate to the growth factors at individual stages of its development (Wasilczuk 2005, pp. 25–26).

The evolutionary theory also provides an important framework for the analysis of business development (Nelson & Winter, 1982; Dosi, 1991). According to this theory, the development of an enterprise is affected by a set of its routines (technical, marketing, investment, diversification routines, as well as routines related to changes in knowledge and innovation) and by its environment. These routines are subject to change (mutation, recombination, transition and transposition) under the influence of the environment, which means that enterprises either grow or go bankrupt. The aim of the enterprise is to enter the market and achieve a high return on capital, as well as survive as long as possible in the market with decreasing profitability of capital which does not allow the survival of its competitors (Noga, 2009, pp.178-180).

Another approach to the enterprise's growth was introduced by D. Storey, who criticised staged models and on that basis built a static model which takes into account a combination of three factors: the characteristics of the entrepreneur (e.g.: the entrepreneur's motivation, education, experience, age, gender, family traditions), the characteristics of the enterprise (e.g.: the enterprise's age, sector, legal status, location, size and ownership) as well as the type of development strategy (e.g.: the enterprise's technical level, market position, new products, competitiveness) (Piasecki, 2001, p. 51).

J. Wasilczuk (2005, pp. 130–132) has proposed a dynamic growth/development model of small and medium-sized enterprises in which she identifies the following groups of factors influencing the enterprise's growth/development:

- initial processes (the selection of industry, legal status, company size and location);
- the enterprise's resources dependent on the competence of the owner and initial processes;
- the competence of the owner-manager as a key element of the whole system since the perception of possibilities for the company's development, along with opportunities and risks presented by

the environment, as well as the results achieved depend on this competence;
- growth opportunities (actual and perceived by the owner);
- objective, strategy, management;
- the real environment and the subjective one perceived by the owner.

Summing up the current discussion present in the literature, there is no comprehensive theoretical interpretation of the causes of the development of enterprises, including small and medium-sized ones. Although it is possible to identify the key development factors of different types of companies, it is difficult to formulate a coherent model of business development for predicting the enterprise's development capacity (Smallbone, Leigh & North, 1995). The growth/development models presented earlier, despite their diversity, have some common elements and define the determinants of the development of small and medium-sized enterprises which will be discussed in detail later in this paper.

The paper aims to identify external determinants of the development of small and medium-sized enterprises and assess their impact on the functioning of these entities in Poland.

Determinants of the development of small and medium-sized enterprises – a classification attempt

Numerous papers cite different classifications of determinants of the development of small and medium-sized enterprises affecting the nature, dynamics and structure of development processes occurring in these entities (e.g.: Storey, 1994; Guzmán & Santos, 2001; Nogalski, Karpacz & Wójcik-Karpacz, 2004; Steffens, Davidson & Fitzsimmons, 2009; Skowronek-Mielczarek, 2011; Lisowska, 2013). In this paper, a division of the determinants of the development of small and medium-sized enterprises into two categories, internal and external ones, has been adopted.

Internal determinants are most often classified in relation to the person of the entrepreneur and to the enterprise (e.g.: Wasilczuk, 2005; Romero & Fernandez-Serrano, 2011; Lisowska, 2012). The analysis of internal determinants associated with the person of the entrepreneur often refers to the approaches proposed by F. Baławat (2003, p. 49): biographical, personality-related, behavioural and relational ones. The biographical approach distinguishes the following development factors: age, sex, knowledge, professional education and business experience. The personality-related approach considers personality traits such as willingness to take risks, motivation, propensity for innovation, a need for achievement, diligence, etc. The behavioural approach sees as the driving force behind development processes the entrepreneur's attributes considered in terms of entrepreneurial

behaviour patterns (e.g.: the entrepreneur's work style, attitude towards opportunities and changes, propensity for innovation, managerial skills, attitude towards risk). The relational approach is mostly concentrated on the attitude towards risk, creativity, leadership, opportunities, etc. (Bławat 2003, pp. 57-60).

The other group of internal determinants of SME's development relates directly to the enterprise. The main factors include: the enterprise's age (the duration of its functioning in the market), the size usually measured by the number of employees, the scope of operation, the sector and the changes occurring in it, independence (compare: Storey, 1994; Piasecki, 2001; Steffens, Davidson & Fitzsimmons, 2009), as well as the enterprise's internal resources (human, tangible, financial and intangible).

External determinants are identified mostly with the environment of small and medium-sized enterprises, defined as the external environment which is a set of factors that influence the functioning and development of these enterprises. From the subject-based approach, the environment is a set of institutions and organised interest groups, but from the object-based approach, it is a set of processes and phenomena which the enterprise is subjected to and which it may also affect (Wach, 2008; Kamińska, 2011).

In the context of the analysis of the environment, external determinants are divided into: macro-environment, meso-environment and micro-environment (Bednarczyk, 1996; Skowronek-Mielczarek, 2011). The macro-environment, i.e. the so-called far environment, is a set of general conditions of operation in the case of a particular enterprise functioning in the given country or area. This type of environment includes the following five dimensions (Griffin, 2010): economic, political, legal, technological, social, cultural and international.

The meso-environment is the regional environment which encompasses factors that influence the enterprise in the regional dimension, taking into account the specific features of particular areas. The structure of meso-environment can be also considered on the basis of the subject-based approach (Bednarczyk, 1996) and/or the object-based approach (Wach, 2008). According to the subject-based approach, the meso-environment includes (Bednarczyk, 1996, p. 46):

- public administration bodies (e.g.: local government, Inland Revenue offices);
- service infrastructure entities associated with business activity (e.g.: regional development agencies, chambers of commerce and industry, entrepreneurship incubators, training and consulting companies).

According to the object-based approach, the meso-environment consists of (Wach, 2008, p. 34–35):

- financing institutions (e.g.: banks, financial partnerships, guarantee funds, leasing companies, regional financial institutions),
- local government institutions (e.g.: local authorities, local administration units),
- business self-government institutions (e.g.: chambers of commerce, chambers of crafts, employers' associations),
- research and academic institutions (e.g.: universities, research institutes, science and technology parks, information centres),
- institutions of the state apparatus (e.g.: Inland Revenue offices),
- institutions active in the area of entrepreneurship development (e.g.: regional development agencies, entrepreneurship incubators, industrial clusters, consulting firms, training companies),
- entities within the given sector (e.g.: competitors, suppliers, customers),
- specific groups of influence (e.g.: local communities, local lobbying groups).

The micro-environment, i.e. the so called competitive environment, includes customers, suppliers, business partners, competitors and trade unions (Wach 2008, Griffin 2010). These entities maintain cooperative or competitive relations with the enterprise (Kamińska 2011, p. 42) and a feedback relationship constitutes an important feature of such relations. The analysis of this type of environment enables the determination of conditions for the functioning and development of small and medium-sized enterprisThe above-mentioned deliberations indicate that determinants of the development of small and medium-sized enterprises can be considered in the set of stimulants and barriers to development. In the analysis, it is worth focusing on the subjectivity of the evaluation of individual factors, as well as their changeability over time. Certain factors can become barriers to development for some small and medium-sized enterprises while for others they are development stimulants. For example, complex procedures of obtaining funds from the EU constitute a barrier for companies seeking capital for growth, while consulting firms dealing with assistance in the preparation of applications should see a market opportunity in this factor.

Numerous studies presented in the literature (e.g.: Daszkiewicz, 2004; Starczewska-Krzysztoszek, 2008, Matejun, 2012) indicate mostly the existence of barriers, and the analysis of development stimulants is usually limited to the analysis of strengths (e.g.: Piasecki, 2001; Nehring, 2011) or policies to support SMEs in various areas of activity (e.g.: Filipiak & Ruszała, 2009; Gancarczyk, 2010; Wach, 2008; Kamińska, 2011; Lisowska, 2013). A research model built on the previously analysed groups of determinants has been proposed for further research and analyses (compare: Figure 1). The author is aware that the proposed list of variables representing the determinants of

the development of small and medium-sized enterprises is not exhaustive, the cited literature and the findings of other authors, however, suggest that such a selection of factors is generally accepted and will help clarify the research problem.

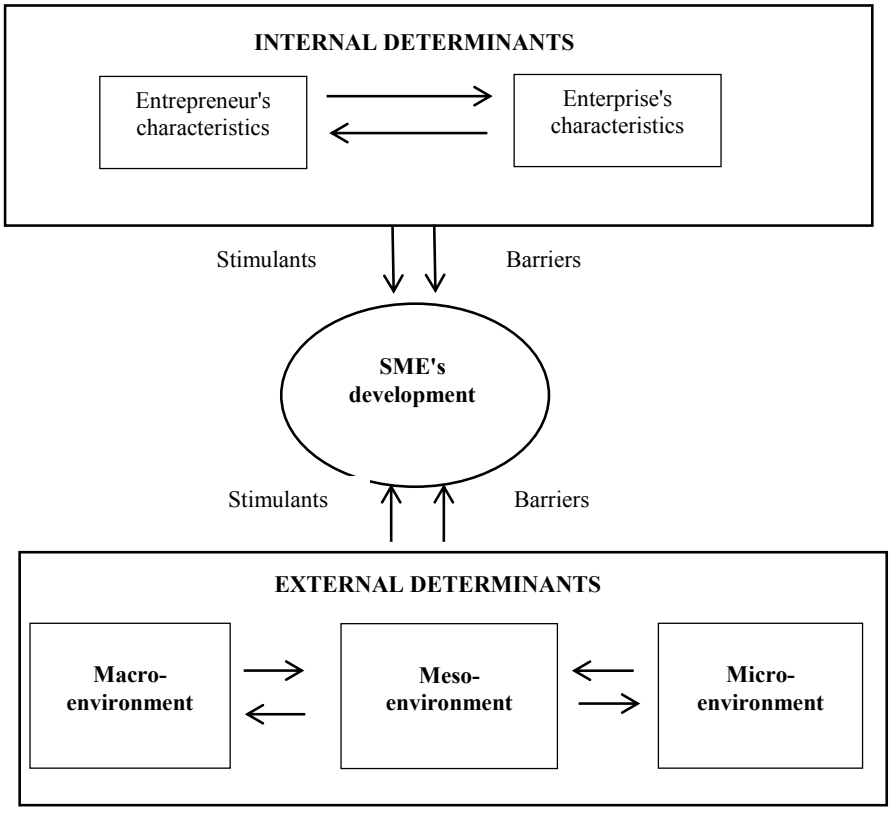

Figure 1. Determinants of the development of small and medium-sized enterprises in marginalised areas – research model

Research methods and characteristics of the enterprises surveyed

The study was carried out in 2012 on a sample of 590 small and medium-sized enterprises from the private sector, set up before 31st December 2007. The national official register of business entities (REGON) of the Central Statistical Office constituted the sampling frame. The so-called legal unit (corresponding approximately to an enterprise with all its subsidiaries) was adopted as the sampling unit (the statistical unit in the study). Then a sample of 6,000

entities was randomly selected. Stratified sampling was used according to the following criteria: the number of persons employed (3 groups: micro-enterprises: 0–9 employees; small enterprises: 10–49 employees; medium-sized enterprises: 50–249 employees) and the voivodeship (region) based on its office location. The sample size was determined with a large excess due to the applied research technique. The study was conducted with the use of a questionnaire sent by mail and e-mail. It was then supplemented by the direct interview survey, due to the low return on questionnaires sent.

The realised sample size i.e. the number of received, completed questionnaires, was 590 (9.8% return rate). The conducted quantitative research, on the one hand, made it possible to reach more business entities and ensure the degree of anonymity of the respondents (it was often a prerequisite for conducting the survey). On the other hand, there was a high degree of difficulty associated with completing the survey, e.g.: partially filled questionnaires and problems with the interpretation of some questions.

In order to assess the representativeness of the realised sample, a comparison of its structure with the structure of the population was carried out based on the following characteristics: the company size (micro, small and medium-sized enterprises) and the location (the voivodeship according to its office address). The comparison results allowed to regard the analysed sample as representative of the general population.

Micro-enterprises were the dominant group in the study (55.8%), while small enterprises amounted to (26.8%) and medium-sized enterprises to (17.4%). The majority of the surveyed enterprises were involved in trade and services (approx. 70%), and only less than 30% in manufacturing. The regional, local and national market was their main area of activity, only one in ten companies expanded its business to the international market. Mostly manufacturing enterprises operated in international markets (Lisowska 2013).

The first part of the research was associated with the analysis of the development dynamics of the studied enterprises. For this purpose, the analysed enterprises were divided into three categories: enterprises in the growth phase, in the stagnation phase and in the regression phase, depending on changes in indicators expressed on an ordinal scale expressed in years: 2009 vs. 2008, 2010 vs. 2009 and 2011 vs. 2010. The first stage involved the selection of indicators and subsequently the k-means cluster analysis was applied for the classification of the analysed enterprises. The cluster method used enabled such clustering of the enterprises that members of a given cluster were characterised by maximum similarity, while similarity between members of the given group and other objects was minimal. In the classification procedure, quantification of selected features, in the form of

continuous variables expressed on an ordinal scale, was carried out first. The quantification was based on assigning specific numerical values to the analysed characteristics. As a result of preliminary analyses, the questionnaire enabled the expression of the state of the phenomenon on the 1-3 scale.

The following indicators were adopted as diagnostic features: turnover, employment, market share and profit levels. The level of change of the given indicator in the analysed periods was assessed by the respondents with the use of the following categories: growth, no change and decline. These marked degrees were assigned consecutive natural numbers: 3 – growth, 2 – no change, and 1 – a decline of the phenomenon. The use of this method allowed to distinguish three categories of enterprises: in the phase of growth, stagnation and regression (Lisowska, 2013, pp. 125-126).

The majority of the surveyed enterprises were in the growth group – 260 enterprises (44.1%), 181 enterprises (30.7%) in the stagnation group and 149 enterprises (25.2%) in the regression group. The analysis by company size showed that the majority of micro-enterprises were in the stagnation phase (40.4%), while most small and medium-sized enterprises were in the growth phase (respectively 47.5% and 54.6%) (compare: Table 1).

Table 1. Characteristics of the surveyed enterprises: the size and phase of development

Company size	Growth phase	Stagnation phase	Regression phase
Micro	31.2%	43.6%	25.2%
Small	47.5%	32.3%	20.2%
Medium	54.6%	22.2%	23.2%

The analysis and evaluation of the impact of external determinants on the development of small and medium-sized enterprises

The aim of the study conducted was to analyse and assess the impact of external determinants of the development of small and medium-sized enterprises in Poland.

The analysis of external determinants of the development of small and medium-sized enterprises was carried out in three areas: the macro-environment, the meso-environment and the micro-environment, according to the research model proposed in the first part of the paper (Figure 1). Using a list of proposed factors, the respondents assessed the degree in which each factor had a positive (stimulant) or negative (barrier) effect on the development of their business. The assessment was made based on a three-point scale where: 1 – negative impact, 2 – no impact, 3 – positive impact.

The first group of analysed external factors were macroeconomic factors, most of which were recognised by the surveyed entrepreneurs as barriers to business development. According to the majority of the respondents, the following factors hinder the development: high costs of raising external capital, the legal system and fiscal policy, strong domestic and foreign competition, the macroeconomic situation of the country, bureaucracy and the grey market. The respondents pointed to the following stimulants: public aid (EU grants), the policy of support for small and medium-sized enterprises and technological progress. In the opinion of the surveyed entrepreneurs, the level of innovativeness of the economy as well as the patent policy and protection of intellectual property had no significant impact on the development of the analysed enterprises. The analysed factors were often barriers for some enterprises and stimulants for others or had no impact on the development of the enterprise, which reflects the individual character of needs of the given enterprises (Lisowska, 2013, p. 142).

The analysis of macroeconomic determinants broken down by company size has not confirmed the diversity of most of the variables examined as evidenced by the Kruskal-Wallis test (more on the subject of the test, among others, in: Aczel 2000; Szwed, 2009) conducted ($p > 0.05$) (compare: Table 2), which indicates a similar set of barriers and stimulants derived from the general environment for each category of the entities analysed.

Table 2. The Kruskal-Wallis statistic (H) and the level of probability value (p) of variables that determine macro-economic determinants of the surveyed enterprises in the context of the company

Macro-environment determinants	The Kruskal-Wallis statistic (H)	Probability value (p)
The macroeconomic situation of the country	1.32	0.72
The legal system and fiscal policy	2.18	0.54
Globalisation	1.20	0.75
The economic situation in the world	4.31	0.23
Technological progress	1.34	0.71
Public aid (EU grants)	2.79	0.42
The policy of support for small and medium-sized enterprises	7.11	0.07
High costs of raising external capital	1.94	0.67
Grey market	1.01	0.78
Strong domestic and foreign competition	6.57	0.11
The level of innovativeness of the economy	1.47	0.70
The patent policy and protection of intellectual property	4.89	0.21
Bureaucracy	5.65	0.19

The micro-entrepreneurs most often pointed to the following barriers to their enterprises' development: the legal system and the fiscal policy, high cost of capital acquisition and the grey market. They indicated the assistance in the form of EU subsidies as a development stimulant. The representatives of small and medium-sized enterprises, as in the case of micro-enterprises, indicated such barriers as high cost of capital acquisition, the legal system and fiscal policy as well as strong competition, while the indicated stimulants focused mainly on the SME support policy. Such a distribution reaffirms the need for better access of these entities on preferential terms to financing and for the improvement in the consistency and transparency of the legal system and the fiscal policy. For all the analysed groups of enterprises, development stimulants included: public support mostly perceived as the EU subsidies and the policy of support for the SME sector, which suggests better perception and the use of the offered support for these entities on the part of the government as well as the EU. (compare: Table 3).

Table 3. The assessment of the impact of macro-environment determinants on the development of small and medium-sized enterprises [%]

Macro-environment determinants	Company size								
	Micro			Small			Medium		
	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact
The macroeconomic situation of the country	22.1	20.1	57.8	19.4	18.5	62.1	22.3	21.9	55.8
The legal system and fiscal policy	10.9	12.4	76.7	13.4	16.2	70.4	9.8	22.1	68.1
Globalisation	34.5	34.5	31.0	32.4	33.8	33.8	31.8	34.6	33.6
The economic situation in the world	33.8	32.4	33.8	31.9	34.6	33.5	35.7	30.1	34.2
Technological progress	41.7	29.5	28.8	42.5	29.6	27.9	39.7	30.9	29.4
Public aid (EU grants)	55.6	20.5	23.9	44.9	31.5	23.6	51.2	26.5	22.3
The policy of support for small and medium-sized enterprises	42.1	29.4	28.5	53.1	24	22.9	54.6	22.3	23.1
High costs of raising external capital	9.6	14.5	75.9	10.5	17.1	72.4	10.6	18.5	70.9
Grey market	10.7	16.9	72.4	26.8	30.9	42.3	28.8	26.5	44.7
Strong domestic and foreign competition	14.2	20.1	65.7	12.4	17.8	69.8	13.2	20.3	66.5
The level of innovativeness of the economy	29.1	46.7	24.2	31.6	44.9	23.5	24.7	49.5	25.8
The patent policy and protection of intellectual property	26.1	50.3	23.6	27.3	49.7	23.0	30.9	42.6	26.5
Bureaucracy	25.3	22.3	52.4	28.5	20.6	50.9	25.7	25.5	48.8

Data for 590 enterprises.

Another group of analysed external determinants of the development of small and medium-sized enterprises consists of determinants derived from the meso-environment. In the opinion of the majority of the respondents, most of the variables examined were barriers, such as: access to capital and financial assistance, the condition of transport and telecommunications infrastructure, the policy of local authorities in terms of creating a climate favourable for business activity as well as the quality and accessibility of services provided by business environment institutions (Lisowska, 2013. p. 145). Such a distribution of responses indicates the need for targeted policies to support small and medium-sized enterprises to improve financing for this sector. The development of SMEs is dependent on the possibility of obtaining and using external sources of financing, as well as the efficiency and effectiveness of the functioning of the widely understood business environment. The group of determinants that could have a positive impact on the development of the enterprises surveyed according to the respondents included: investments in the region and access to public aid, cooperation of enterprises in the region as well as transfer of knowledge and technology within the region. In the opinion of the surveyed entrepreneurs, natural resources of the region and its geographical location did not have a significant impact on the development of the analysed business entities (Lisowska, 2013. p. 145).

Table 4. The Kruskal-Wallis statistic (H) and the level of probability value (p) of variables that determine meso-economic determinants of the surveyed enterprises in the context of the company

Meso-environment determinants	The Kruskal-Wallis statistic (H)	Probability value (p)
Geographical location of the region	13.15	0.00
Socio-economic development in the region	17.29	0.00
Investments in the region	14.23	0.00
Natural resources in the region	6.27	0.09
Cultural and natural assets of the region	4.48	0.21
Knowledge and technology transfer in the region	19.74	0.00
Access to capital and financial assistance	1.49	0.68
Access to public aid (e.g.: EU funds)	11.24	0.00
Quality of human capital	10.19	0.02
Policy of local authorities – creating a climate favourable for business activity	15.94	0.00
Standard of living of the local community	1.94	0.59
Quality and accessibility of services provided by business environment institutions	13.66	0.00

The analysis of regional determinants broken down by company size allowed for highlighting the diversity most of the variables examined, which was confirmed by the conducted Kruskal-Wallis test ($p < 0.05$) (compare: Table 4).

In the case of micro-enterprises, the respondents pointed most often to the following stimulants of development: natural resources of the region, as well as cultural and natural assets of the region. The indicated barriers included: inadequate access to capital and financial assistance, the policy of local authorities in terms of creating a favourable climate for business development, the quality and accessibility of services provided by business environment institutions, the condition of transport and telecommunications infrastructure, access to public aid (including EU funds). The respondents in small enterprises most commonly indicated the following development stimulants: access to public aid and the geographical location of the region. The barriers included: the policy of local authorities in terms of creating a favourable climate for the development of enterprises, the low quality of human capital and poor access to capital and financial assistance. In the case of medium-sized enterprises, the respondents mostly pointed to barriers, such as the condition of transport and telecommunications infrastructure, the socio-economic development of the region, the policy of its local authorities in terms of creating a climate favourable for business development, a lack of knowledge and technology transfer in the region and the low quality of human capital (compare: Table 5).

Table 5. The assessment of the impact of meso-environment determinants on the development of small and medium-sized enterprises [%]

Meso-environment determinants	Company size								
	Micro			Small			Medium		
	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact
Geographical location of the region	35.2	33.4	31.4	38.1	34.6	27.3	22.7	37.5	39.8
Socio-economic development in the region	38.6	37.9	23.5	24.8	36.7	38.5	27.5	26.9	45.6
Investments in the region	28.4	23.1	48.5	31.2	32.1	36.7	30.6	29.9	39.5
Natural resources in the region	43.7	33.6	22.7	33.4	32.1	34.5	38.0	33.7	28.3
Cultural and natural assets of the region	40.1	31.2	28.7	34.5	32.4	33.1	38.8	30.3	30.9
Knowledge and technology transfer in the region	30.5	38.1	31.4	35.7	38.2	26.1	25.8	33.7	40.5
Access to capital and financial assistance	14.3	25.5	60.2	24.1	32.1	43.8	24.2	36.3	39.5

Access to public aid (e.g.: EU funds)	29.7	23.6	46.7	41.7	31.5	26.8	36.4	37.1	26.5
Quality of human capital	33.4	31.4	35.2	27.5	23.8	48.7	27.2	32.3	40.5
Condition of transport and telecommunications infra-structure	19.7	33.2	47.1	29.4	35.1	35.5	21.3	23.4	55.3
Policy of local authorities – creating a climate favourable for business activity	19.2	30.1	50.7	11.2	30.6	58.2	25.8	29.7	44.5
Standard of living of the local community	31.4	33.4	35.2	32.1	31.2	36.7	29.4	38.2	32.4
Quality and accessibility of services provided by business environment institutions	22.8	27.9	49.3	22.7	37.5	39.8	23.4	37.9	38.7

Data for 590 enterprises.

Determinants of the development of SMEs derived from the micro-environment constituted another area of analysis. According to the respondents, most of the variables studied were barriers and they included: the demand for products and services offered, strong competition, high barriers to market entry and demanding customers. According to the respondents, the group of determinants that could have a positive impact on the development of the enterprises surveyed included: cooperative relations with other companies and demanding customers. The analysis of microeconomic determinants broken down by company size allowed the highlighting of the diversity of most of the variables examined, which was also confirmed by the Kruskal-Wallis test ($p < 0.05$) (compare: Table 6).

Table 6. The Kruskal-Wallis statistic (H) and the level of probability value (p) of variables that determine micro-economic determinants of the surveyed enterprises in the context of the company size

Meso-environment determinants	The Kruskal-Wallis statistic (H)	Probability value (p)
Demand for products and services offered	1.30	0.52
High barriers to market entry	2.54	0.28
High barriers to market exit	7.95	0.06
Impact of suppliers	9.34	0.04
Strong competition	3.04	0.39
Cooperative relations with other companies	13.75	0.00
Demanding customers (recipients)	4.34	0.23

The respondents in the micro-enterprises pointed to the following barriers to their development resulting from the micro-environment: the demand for products and services offered as well as high barriers to

market entry. In the case of the small enterprises, barriers included strong competition and demanding customers, while the medium-sized enterprises indicated the impact of suppliers and strong competition (compare: Table 7). The respondents also pointed to development stimulants which included cooperative relations with other entities, which may indicate an appreciation on the part of the entities surveyed of both financial (e.g.: joint projects, acquisition of new technologies), as well as non-financial (e.g.: the exchange of knowledge and experience, trust between partners) benefits resulting from such cooperation.

Table 7. The assessment of the impact of micro-environment determinants on the development of small and medium-sized enterprises [%]

Micro-environment determinants	Company size								
	Micro			Small			Medium		
	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact	Positive impact	No impact	Negative impact
Demand for products and services offered	18.7	20.1	61.2	26.4	28.5	45.1	31.2	27.9	40.9
High barriers to market entry	14.7	25.7	59.6	23.2	33.7	43.1	25.8	33.0	41.2
High barriers to market exit	31.6	34.6	33.8	33.8	32.4	33.8	24.7	30.6	44.7
Impact of suppliers	33.4	31.9	34.7	34.6	31.9	33.5	17.6	14.5	67.9
Strong competition	22.7	28.1	49.2	16.2	13.4	70.4	27.3	20.1	52.6
Cooperative relations with other companies	55.6	20.5	23.9	46.9	21.6	31.5	41.2	28.5	30.3
Demanding customers (recipients)	34.0	21.4	44.6	22.0	14.9	63.1	52.6	24.3	23.1

Data for 590 enterprises.

Conclusion

The development of small and medium-sized enterprises is influenced by many internal determinants related to the characteristics of the entrepreneur and the enterprise (these determinants were not examined here), as well as external determinants arising from the environment. The determinants can contribute to but also restrict the development of SMEs. The study on external determinants of the development of small and medium-sized enterprises presented in the paper suggests that:

- the analysis of determinants stemming from the macro-environment indicates their impact on the growth/development of the surveyed enterprises especially in the area of barriers which included: high costs of raising external capital, the legal system and the fiscal policy, strong domestic and international competition, the macroeconomic

situation of the country, bureaucracy and the grey market. In terms of stimulants, the respondents pointed to the public aid (the EU grants), the policy to support small and medium-sized enterprises and technological progress. The analysis of macroeconomic determinants broken down by the size of the company does not confirm the diversification of the variables studied, as evidenced by the conducted Kruskal-Wallis test ($p > 0.05$), which indicates a similar set of barriers and stimulants derived from the general environment for each category of the entities analysed.

- determinants resulting from the meso-environment varied for each category of entities due to the company size, which was confirmed by the Kruskal-Wallis test ($p < 0.05$) and were mainly considered as barriers. In the case of the micro-enterprises, the respondents indicated as barriers to their development insufficient access to capital and financial support, the policy of local authorities in terms of creating a climate favourable for the development of enterprises as well as the quality and availability of services offered by business support institutions. In the small enterprises, the group of highlighted barriers included: the policy of local authorities in terms of creating a climate favourable for the development of enterprises, a lack of cooperation among enterprises in the region, the low quality of human capital as well as inadequate access to capital and financial assistance. On the other hand, in the case of the medium-sized enterprises, the respondents mostly pointed to the existence of barriers which included: the condition of transport and telecommunication infrastructure, the socio-economic development of the region and the policy of local authorities in terms of creating a climate favourable for business development. Such a distribution of responses indicates the need for targeted policies to support small and medium-sized enterprises in order to improve the funding of the sector and access to specialised services offered by the widely understood business environment.
- the analysis of determinants resulting from the micro-environment showed a mostly negative influence of these factors on the growth/development of SMEs and their diversity for each category of entities due to the company size, which was confirmed by the Kruskal-Wallis test ($p < 0.05$). In the micro-enterprises, the respondents indicated the following elements resulting from the micro-environment as barriers to their development: the demand for products and services offered as well as high barriers to market entry. The small enterprises indicated strong competition and demanding customers, while the medium-sized enterprises pointed to the impact of suppliers and strong competition. These results indicate the need to improve the

competitiveness of these entities, which would reduce the impact of barriers resulting from the micro-environment.

- the entrepreneurs surveyed are aware of the benefits resulting from the cooperation with other companies, which may contribute to the development of such cooperation in various spheres, i.e. typically economic contacts, such as joint selling of products, as well as non-economic ones covering the exchange of knowledge and the outsourcing of expert opinions, analyses and studies, participation in fairs, exhibitions and conferences, technology purchasing, etc.

The presented results are consistent with the findings of other studies carried out in Poland (e.g.: Borowiecki & Siuta-Tokarska, 2008; Daszkiewicz 2009; Trendy rozwojowe… 2012 and 2013; Matejun & Motyka 2015; *Czarna lista barier*….2013 and 2014; *Informacja o kondycji*…2014 and 2015). Market barriers, i.e. low demand, strong competition and the grey market, as well as legal and political barriers, i.e. a lack of transparency and clarity of legislation along with the amount of taxes and fees required by the law, proved to be an important group of barriers for small and medium-sized enterprises. Capital constraints are also emphasized as a significant barrier to the development of SMEs in all the studies conducted. Availability of external capital and its cost are elements of particular importance for the development and expansion of small and medium-sized enterprises. Development opportunities, in turn, translate into increased innovation and competitiveness of these enterprises and the strengthening of their market position. Problems with access to capital may result in low propensity to invest, and thus low propensity for innovation, which is another barrier to the development of small and medium-sized enterprises. It is widely believed that these entities are characterised by a low degree of innovativeness and intensity of the use of advanced technologies. Introduced innovations usually rely on one type of product or service, hence the likelihood of the introduction of changes by these entities is smaller than in enterprises with a wide range of products or services and complex processes, such as most large enterprises (Lisowska 2013). Financial resources derived from the EU have provided an opportunity for the development of small and medium-sized enterprises, including innovative activities. However, as shown by the programming perspective 2007-2013, entities in this sector do not always have the opportunity to apply for these funds due to complex formal procedures associated with this process, as well as insufficient resources for their own contribution to the project. Business environment institutions, offering support in the form of specialised services responding to the needs of SMEs, should play an important role in improving this situation.

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Abstrakt (in Polish)

Celem artykułu jest identyfikacja zewnętrznych determinantów rozwoju małych i średnich przedsiębiorstw oraz ocena ich wpływu na funkcjonowanie tych podmiotów w Polsce. Osiągnięcie tego celu wymagało: określenia determinantów rozwoju MSP, dokonania oceny obecnego stanu rozwoju badanych przedsiębiorstw oraz zbadania wpływu zewnętrznych determinantów na rozwój MSP. Realizacja przedstawionych powyżej celów oparta była na następujących założeniach: (i) obecna sytuacja badanych przedsiębiorstw określona jest przy pomocy wskaźników ilościowych (wielkość obrotu, zatrudnienie, udział w rynku, dochody) (ii) analiza determinantów zewnętrznych obejmuje trzy elementy otoczenia: makrootoczenie, mezootoczenie i mikrootoczenie, (iii) w każdym analizowanym obszarze dokonuje się odrębnych analiz dla mikro, małych i średnich przedsiębiorstw, co umożliwia bardziej precyzyjne określenie zewnętrznych determinantów rozwoju dla każdej z tych kategorii przedsiębiorstw.

Keywords: *rozwój MSP, determinanty rozwoju MSP, mikrootoczenie, mezootoczenie, mikrootoczenie.*

Biographical note

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Regenerative Medicine as an Emergent Cluster in Tampere Region

Tuomo Heinonen[1], Francisco Javier Ortega-Colomer[2]

Abstract

Clusters are important for regional economies and emergent clusters are in a key position, as a means of adding more diversification to the current economic activity by involving new technologies and industries. Science-based industries may be the most promising in this regard since they are encouraged to develop and enhance the economic imaginaries of territories under the umbrella of radical innovations or in the name of broadening the current economic model based on mostly traditional industries. Regenerative medicine (RM) could be an example of these so-called emergent clusters. Regenerative medicine is highly dependent on academic research, which means that local territories must fund the research in this field and, hence, they expect some returns as well. As territories do not typically have existing industries specifically in RM, these industries must emerge or expand from existing ones. Regenerative medicine involves a wide spectrum of different technologies and industries that are likely to form a cluster and benefit from it if successfully developed. The first aim of this paper is to show how some obstacles eventually impede the proper development of these emergent clusters. The second aim is to shed light on how innovations emerge in the cluster and what are the main implications for the territory. In this study, existing literature is used in order to describe the technology market and commercial aspects of the RM sector. Empirically this study is based on the emergent RM cluster in the region of Tampere in Finland. Analysis of 24 conducted interviews helps to contextualize the emergence of the RM cluster in Tampere, where academia is both the booster and the driver of the emergent RM cluster. Commercialization of research in the RM field is one of the goals at the university, even though there are no commercial outcomes yet available. This study contributes to the understanding of emergent cluster development in science-based industries in their embryonic and early stages. Major challenges are pointed out in an emergent cluster that calls for tailor-made socio-economic policies at the meso-level. Tailored policies matter in science-based clusters, and specific sectors in specific stages of development need specific policies in order to become matured clusters.

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Keywords: *regenerative medicine, emergent cluster, commercialization, innovation, competence bloc, technology market.*

Introduction

Clusters are important for regional economy as they include different industries working together (Saxenian, 1994). Many traditional clusters e.g. textile, IT, automotive, food, energy, etc., include matured industries (Iammarino & McCann, 2006). As scientific development in universities goes forward, there may be possibilities to create new industries and even new clusters, as many different technologies are often needed in order to fully exploit scientific research (Stoerring, 2007; Stoerring & Dalum, 2007). In this study, the regenerative medicine (RM) sector is used as an example of a new emergent science-based cluster (Pavitt, 1984). Globally in the RM sector, commercial development is only in its early stage, and innovation is dependent on academia, research centres and hospitals (McMahon & Thorsteinsdottir, 2013). The future of the RM sector is highly dependent on university-based research, overcoming the financial gap, and the emergence of firms, and in the process of RM sector development, hospitals play a significant role as an endpoint of therapies.

Conceptually this study contributes to the cluster life cycle theory by discussing the commercial engine that enables growth and introducing some empirical evidence from the very early phase of a cluster life cycle. As clusters tend to speed up innovation, firm creation and growth (Baptista & Swann, 1998), new sectors like RM would presumably benefit clustering. However, due to the small number of commercial entities globally in the RM sector, it is not possible to study matured clusters and their early phases. Instead, an emergent science-based RM cluster in the Tampere region provides an opportunity to scrutinize the very early phases of a potential cluster *ex ante*. As a result of university-based innovations, it might be possible to see the emergence of new firms and the growth of existing firms who expand their product or service portfolio to the RM sector.

The first aim of this study is to show how some obstacles eventually impede the proper development of these emergent clusters in the RM sector. As the development of commercial RM products costs significantly and takes a long time, firms need to overcome these challenges. The second aim is to shed light on how innovations emerge in the cluster and what are the main implications for the territory. To answer these questions, a case study was conducted in Tampere, Finland. In Tampere, RM-related innovations are developed in academia with great hope for future economic growth, in terms of new firms, expansion of existing firms, and employment.

Cluster view on RM

The study of clusters as research objects traces its roots back to the 1990s (Porter, 1990). The main motivation for cluster analysis is to understand how a country/region (or whatever the level is being talked about) gains the competitive advantage of related sectors embedded in a region compared with other global competitors or other lower-scale (local) territories. However, studies on these matters have confirmed the existence of more appropriate conceptual frameworks, mainly from the innovation studies community, where technological change is included as one of the cornerstones to explain the dynamics of the sector. Another dimension included in the innovation systems framework is the multi-level perspective (Geels, 2002), in order to understand the correlation of the forces between actors (distributed agency) at different territorial levels (international, national, regional and local). Among different models proposed by innovation scholars, in this article we used as a theoretical background (Figure 1) the model of innovation system proposed by Arnold and Kuhlmann (2001). These authors propose a model that not only shows but also emphasizes the important aspect of demand affecting both industry and university, and is divided into final demand and intermediate demand. Political sphere influences are also analysed under this framework by including both government and policies that affect brokers between universities and industry, supporting infrastructure, and universities. In summary, three elements are present within this framework: 1) a set of institutions, which promote and enable innovations to occur; 2) the interactions between those above-mentioned players; and 3) the environmental conditions within which the system works. This functional view on innovation systems is treated in the work of Hekkert et al. (2007).

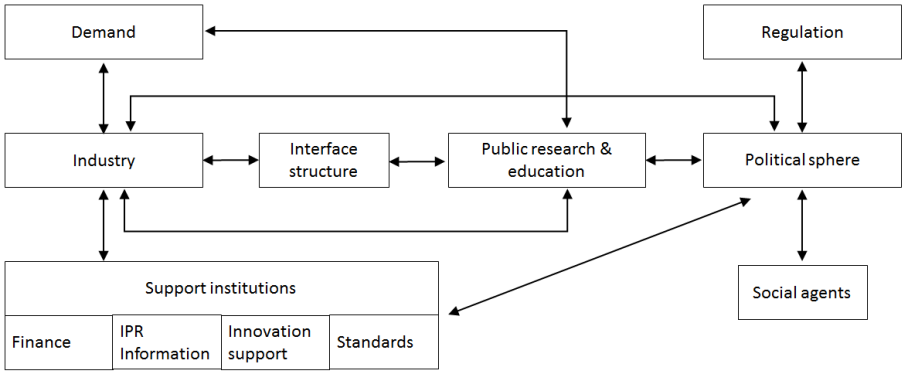

Figure 1. Theoretical framework modified from Kuhlmann and Arnold (2001)

Source: Original framework was presented in the order Arnold and Kuhlmann in the publication Kuhlmann and Arnold (2001).

Demand is an important aspect of the emergent cluster and in the RM sector it is quite complex. Is the customer a patient who gets treatment, the society who benefits from healthier people, or a hospital, which delivers the treatment? As in any sector, depending on the business strategy, firms produce different products at different points of the supply chain – for example, a firm producing compounds as a supplier, a hospital delivering generated bone to the patient, or a firm utilizing stem cells in a gene therapy. The other thing is that innovation requires different competencies in different phases. For this reason, Eliasson and Eliasson (1996) developed the competence bloc theory, which is a good starting point to evaluate the needed competencies for economic growth and successful innovations from both a business and innovation point of view, as the competence bloc is the infrastructure needed to create, select, recognize, diffuse and exploit new business ideas (Table 1). Eliasson and Eliasson (1996) argued that in the emerging biotechnology sector sustainable economic growth would be reached through entrepreneurs funded by venture capitalists, and winners later acquired by established companies acting as industrialists. It thus calls the human competencies that are needed to create new businesses and industrial success (Eliasson & Eliasson, 1996). This also describes the dynamics in the emergent science-based cluster. As universities are innovators, entrepreneurs are needed to carry emerging innovations forward. Competence bloc theory also implies that enough entrepreneurs are located in the territory so that venture capitalists are able to recognize those that are most viable ones. Those firms that are not viable will be terminated fast so that they have an opportunity to select another potential innovation to work on.

Table 1. Actors of competence bloc

Actors	Tasks	Function in infrastructure
Customer	Active, competent and resourceful. Products are never better than customers are capable of demanding.	Demand
Innovator	Connects technical specializations.	Creation
Entrepreneur	Selects commercially potential innovations.	Selection
Venture capitalist	Recognize and finance commercially viable opportunities.	Recognition
Industrialists, business leaders and financial experts	Bring new product to full-scale production.	Exploitation
Exit-market	Expectation for reasonable or better profit for those who are successful.	Incentive

Source: Eliasson and Eliasson, (1996).

The cluster life cycle follows four phases: formation, development, maturity and renewal/decline (Belussi & Sedita, 2009). First firms are established in the formation phase, followed by a significant growth in the firm population in the development phase. Maturity comes when firm population is stabilized. The competence bloc is especially important in the formation phase of the cluster and its subsequent development phase. In the biotechnology-related industries, start-ups tend to be those that develop innovations and established companies bring those new products to full-scale production. If needed competencies are not available, it is not likely that the development phase of the cluster will continue very far, if it begins at all. As the cluster grows (development phase), local firms are also able to innovate and that way expand their product offerings. At this point, the locus of activity in the emergent cluster shifts from academia to firms, even though academia and hospitals have important roles in creating new knowledge, innovations, being the places for clinical trials, and act as end-users.

Data and method

Empirical insights in this study are based on a single case study conducted in Tampere, Finland. Although it would have been more desirable to include more case studies in the research, the quest for a pluralist approach and a deep perspective allowed us to conduct only a single case study (Yin, 1989). This obviously does not support generalizability, but ensures a richer look at one emergent phenomenon on a global scale (Marshall & Rossman, 1999). The major share of interviews were conducted at the Institute of Biosciences and Medical Technology (BioMediTech), which is a joint institute of the University of Tampere and Tampere University of Technology. In BioMediTech, the Human Spare Parts research programme was the focus, as it is focusing on RM therapies and technologies. This article emphasizes the emergence of a cluster, which has its roots in the university level. The science-based cluster is in the formation phase, which means that no firms have emerged yet. Thus, inclusion of more firms in the interviews is not plausible and instead interviews focused to the university. Altogether 24 interviews were conducted (Table 2), and in all of the interviews the same semi-structured set of questions was used within the following main themes: research, entrepreneurship, venture finance, legitimization, market formation, hospital environment, and end-value. As a result these interviews gave a coherent view of how different actors at different levels understand the emergent RM cluster in Tampere. Other sources for information were relevant documents, articles and news that were used to describe the history of this emergent RM cluster as well as the industrial sphere.

Table 2. Conducted interviews, organizations and organization level

Organization	Number of interviews	Level
BioMediTech (University)	15	Local
University Hospital of Tampere	3	Local
Firm	1	Local
Regional development agencies	2	Regional
Ministry of Employment and the Economy	2	National
The Finnish Funding Agency for Technology and Innovation	1	National

Elements of the emerging RM sector with an impact on industrial development

In human healthcare, there have traditionally been two main disciplines: medicine and surgery (Polak et al., 2010) and RM could be a third one attempting to revolutionize healthcare. A short, simple definition of RM is provided by Mason and Dunnill (2008a: 4): 'Regenerative medicine replaces or regenerates human cells, tissue or organs, to restore or establish normal function'. Hence, RM uses medicine, surgery, and other disciplines as a multi-disciplinary field (Polak et al., 2010), and even though it is mostly based on cell therapy, i.e. the expected fourth pillar of the healthcare sector alongside pharmaceuticals, biopharmaceuticals and medical devices (Mason & Manzotti, 2009), it consists of a wide spectrum of different approaches and technologies. The set of potential industries is quite wide and is organised in different levels regarding the supply chain; for example, a firm that decides to concentrate on regenerative compounds is most probably a supplier to a firm concentrating on tissue engineering. Also hospitals are important for progress in RM because they provide the infrastructure for surgery and care of patients, but also ideas regarding current needs where RM therapies might help.

Major expectations for the RM sector are based on the use of stem cells. The biggest hurdle for the use of stem cells derived from human embryos is the ethical and political environment (Harvey, 2010) and in some EU countries it is not possible to have a patent relating to human cells derived from embryos (Mason & Dunnill, 2008b). In general, there are currently different laws among the nations in the EU and the US regarding the use of embryos (Mason & Dunnil, 2008b). With induced pluripotent stem cells (iPSC), found in 2006, it might be possible to overcome these hurdles and thus generation of iPSCs might have a major impact on RM (Amabile and Meissner, 2009). However, there are concerns if iPSCs are identical to embryonic stem cells and if not, what is the level of similarity for therapeutic and screening purposes?

Thus there are some challenges to be met before iPSCs can be used routinely in pharmacological screening and RM (Amabile & Meissner, 2009).

According to Martin et al. (2006), there were two waves of commercialisation and industry building in the RM sector – the first was between the 1980s and the 1990s, and a second wave from the mid-1990s onwards. In the first wave, the U.S. dominated, but in the second wave, Europe has established a stronger presence. According to Mason (2007), the problem is that funding in the RM sector (somewhere around 2005) has switched from venture capital and pharmaceutical firms to public finance, philanthropists and military products. Venture capitalists are not interested in investing in firms until later phases of the clinical trials (Parson, 2008). However, start-ups need funding for research, development, small-scale manufacturing, and early clinical trials (Mason & Dunnil, 2008b). Parson (2008) believes that for the majority of firms the future will depend on the possibility of moving forward from start-up-funds to later stage funds to sustain their products through clinical trials. For making this possible, one of the most relevant needs start-up companies in the RM sector is a competent management group (Johnson et al., 2011). However, Parson (2008) points out the limits of a start-up company in the RM sector, where a large amount of cells are needed for treatment in a large patient population and a small start-up company may not be large enough to conduct the required trials. Hence, another strategy for an entrepreneurial firm is to be acquired by a bigger company, which is a possibility for a venture capitalist to exit the company if involved, and the established company as an industrialist continues to bring the product to full-scale production.

Metcalfe et al. (2005) made an important point about the sustainability of the new technology and its requirements. According to them, commercial investments are sustainable only if there is a possibility of obtaining a necessary return from the market, and from this point of view, the development of demand and the role of regulation in establishing demand are both important. However, if the market is not fully established, technology development can be supported by non-commercial investment and instead of a technology 'pull', the only option that is left is to try technology 'push' with university based research.

For the companies in the RM sector it is important to have access to cutting edge research (Prescott, 2011). Academia and firms have several innovation co-operation activities, e.g. funding, licensing, consulting and advising between the scientific and technological networks in tissue engineering (Murray, 2002), and scientists with new ideas even have roles in RM firms bringing human and social capital with them (Murray, 2004). However, universities are expected to nurture innovation further in clinical

trials before establishing start-ups and obtaining venture capital for it; some countries are actually filling this gap by establishing government centres for funding cell therapy clinical trials (Mason et al., 2011). In Finland this is not the reality yet.

Hellman et al. (2011) argued about the need for collaborative interactions between scientists, physicians, investors, attorneys, regulators, political entities and patients in building a biomedical industry. The RM sector will need highly specialized hospitals and day-care centres where cells are implanted and therapies conducted, and thus, training for the clinical community must be conducted in order to be able to use products (Mason & Dunnil, 2008b). Regulatory bodies, though, are not always up to date about biomedical scientific understanding and possibilities of technology, and thus there are examples of evolutionary trajectories where regulation has co-evolved with innovation sequence and the market (Metcalfe et al., 2005).

Salter et al. (2014) make a distinction between different models in stem cell therapies (Table 3). Model I is the only solid scientific innovation model while the rest are so called medical innovation models. Medical innovation in cell therapy is defined the followed way: 'Medical innovation in cellular therapy may be viewed as ethical and legitimate use of non-approved cell therapy by qualified healthcare professionals in their practice of medicine' (Gunter et al., 2010, p. 966). The goal of medical innovation in cell therapy is always to be beneficial for the individual patient while the goal of scientific innovation is to obtain generalizable results (Lindvall & Hyun, 2009).

Table 3. Differences between stem cell innovation models

	Model I	**Model II**	**Model III**	**Model IV**
Scientific / medical innovation	Scientific innovation	Medical innovation (Western)	Medical innovation (non-Western)	Medical and scientific innovation
Regulation	Traditional with clinical trial, advanced therapy medicinal product (ATMP) in EU	ATMP Hospital exemption	Not regulated	Not regulated / traditional with clinical trial
Patient #	Unlimited	Single / small group	Large population	Large population
Product	Clinical application	Non-routine exercise	Clinical application	Clinical application
Ethics	Knowledge generation	Patient benefit	Patient benefit	Patient benefit
Acting professional	Scientist	Clinician	Clinician	Scientist / clinician

Source: Salter et al. (2014).

Gunter et al. (2010) claimed that those patients not eligible for controlled clinical trials should be able to choose unproven but scientifically validated cell therapy options. In addition, it is said that it is not optimal to develop stem cell therapies only via the medical innovation pathway alone (Lindvall & Hyun, 2009). Thus, there might be a place for scientific and medical innovation paradigms in the cell therapy sector, if researchers are competent and patients are truthfully and ethically informed (Gunter et al., 2010).

Currently in developed countries, it is almost impossible to bring new therapies to clinical use without any regulatory approval, as long as there is medical technology innovation involved. There are some exceptions, e.g. advanced therapy medicinal product (ATMP) Hospital Exemption in EU, which allows hospitals to do some clinical treatment without any clinical trials, but in these cases, treatment has to be non-routine treatment and regulatory authority has to approve it. Another problem is that there is no scientifically proven evidence that a product is efficient and safe. The other questions are whether these non-routine treatments can be understood as a new medical practice and what their role is in the development of the RM sector. With accumulated expertise, it is possible to serve patients, but it means that because of the ATMP Hospital Exemption regulation, treatments have to be conducted in the granted country and due to non-routine treatment not all who want to get it are eligible. Thus, regulation restricts medical innovation in very fundamental way, but also makes it safer.

Emergent RM cluster in Tampere

History

Biomaterial research has a long history in Tampere. Already in the 1980s there was advanced research in biomaterials, and researchers were able to develop a bio-absorbable screw to repair bone fractures (Sotarauta & Mustikkamäki, 2015). Two decades later researchers in Tampere were able to grow real bone tissue from patients' own stem cells. This progress and development did not happen in a vacuum, but included several organizations and programmes. One of the steps forward with regard to the RM sector in the Tampere region was the establishment of BioneXt Tampere (2003–2010). This organization was established in order to support tissue engineering, biomaterials, bio-ICT and immunology fields in acquiring needed expertise and investments.

Several organizations in Tampere established Regea in 2005 as a research institute with a focus not only on basic research but especially on clinical applications. One of the successes at that time was that the city of Tampere endowed a professorship for stem cell research to Regea. According to

interviewee: "the vision was from the beginning that this research generates commercial outputs". Indeed, only two years after the establishment of Regea they were able to conduct an operation with a real patient, in which a part of the patient's missing jawbone was reconstructed with stem cells taken from the patient's own fatty tissue. Over the ensuing years, this therapy has been used successfully in over 25 patients in cooperation with Finnish university hospitals, and lately in Tampere. Before the establishment of Regea, a good manufacturing practices (GMP) level laboratory in the University of Tampere was crucial in the development of the clinical tissue engineering application.

Some other initiatives also built a basis for the formation phase of the RM cluster in Tampere. The Biosensing Competence Centre (2007–2010) focused on regional strengths of tissue engineering and clinical diagnostics, and the national programme HealthBIO (2007–2013) focused and contributed to the biotechnology field in Tampere. HealthBIO was a biotechnology cluster focused on utilizing high competence in business and on developing supporting structures. In 2011, the University of Tampere and Tampere University of Technology established BioMediTech as a successor to Regea. BioMediTech continued the prospective stem cell research and the Finnish Funding Agency for Technology and Innovation (TEKES) granted BioMediTech the research programme, Human Spare Parts, which is still going on. Through this research programme, RM research in Tampere has continued to advance. As all initiatives have aimed to strengthen the biotechnology cluster in Finland and in Tampere, RM applications in particular were seen as a strength in which other competencies could be utilized.

Industrial sphere

The emergent RM cluster in Tampere includes many potential application areas in stem cell therapies, diagnostics and supporting technologies. Even though the financial need might be too high for stem cell therapies in relation to readily available funding resources, there are still possibilities for other supporting technologies and diagnostics, for example. In the Tampere region, only a few firms purely focus on stem cell-related services or products and the RM-focused industrial sphere is in a very embryonic formation phase. In life science fields, such as devices, ICT, biomaterials, pharma, and services, there are firms focusing on biomaterials and cell-related technologies, and, traditionally, health and biotechnology industries have been successful in Tampere. There have been few initial public offerings from Tampere in the biotechnology sector. One was in 1997 to the New York stock exchange and the other was in 2004 to the London stock exchange, even though experience from these did not really stimulate the growth of the local ecosystem on a large scale.

Regarding cluster development in the RM sector, there have been only a few small firms in Tampere dealing with stem cells. However, the Tampere region still has some potential firms in the biotechnology industry that could acquire potential RM-related applications and innovations from BioMediTech in later phases of cluster development. In this sphere, there have been over 10 spin-offs from the research groups in Tampere. The good thing for the local industrial sphere is that BioMediTech actively seeks opportunities to commercialize their research, and for this purpose they have established several internal projects. However, currently there are no active connections between small local firms and BioMediTech in order to exploit the potential applications BioMediTech has developed. Instead, BioMediTech seeks partners from established bigger companies abroad.

Therapy development is expensive in the RM sector and both BioMediTech and their stakeholders have acknowledged this. Around 2008, there was a plan to establish the Hospital of Advanced Therapies (HAT) to provide those therapies that Regea (predecessor of BioMediTech) was developing at that time, but eventually the implementation of HAT was suspended. BioMediTech has continued to deliver bone growth therapies through the hospital, though, and the university has planned to start a preclinical study to prepare official clinical trials in collaboration with other organizations. This therapy has in many ways been instrumental in this formation phase of the emergent RM cluster in Tampere, as it has shown the benefits that RM therapies can provide to patients, and has given proof to and hope for actors that there are possibilities in this sphere. It is very important for the potential development phase of this cluster that this therapy, as well as other potential therapies, will be transferred at some point to companies that have a link to the Tampere region. As suggested in the competence bloc theory, an entrepreneurial firm is most likely to carry potential innovation at the beginning and then later an established firm is likely to acquire it. Hence, it is important that BioMediTech also actively seeks connections to established companies and in that way make the Tampere region known to the potential industrialists. However, at the same time there is a need for local start-ups that can acquire innovations from BioMediTech, but also strengthen the competence bloc in the Tampere region in order to shape the way for the development phase of the cluster.

The Finnish market for all potential products is small, locally, and firms must look towards international markets to find customers. As one of the interviewees in the university said: “Whatever products we start to produce here, the market is global”. Thus, international conferences are important for practitioners, being places where it is possible to see in what direction the field is heading. It also means that patenting must be done wisely and rationally with regard to potential markets. This brings challenges for

BioMediTech (and all the universities) as they have to make choices as to what to patent and where. There is also a tension between scientific publications and patenting, which in some cases forces universities to patent too early so that researchers are able to publish their work. Potential market for products is the key thing for firms, and especially in the cases where university research is transferred to start-ups or existing firms. It is important for the emergent RM cluster in Tampere that potential firms are going to stay in the region and establish a manufacturing function. The development of a cluster might be the reason why firms choose to stay in Finland, even though the cost of manufacturing might be relatively high. It is important for local firms that they have the possibility to scale-up their production. However, currently the local competence bloc lacks industrialists but also related services like companies that can help to scale up the cell production. It is important for the process from the formation phase to the development phase of a cluster, such as the current science-based emergent RM cluster, that the emergence of local businesses and supporting services happens simultaneously. Locally there is also a need for a stronger interface structure between industry and academia in the RM fields.

Demand

Multi-level demand has been the most important aspect in this formation phase of the emergent RM cluster in Tampere. One of the other most important aspects is that real patients have been treated with bone growth therapy. This therapy is for patients' benefit, and in the end it is patients who create a demand for new RM therapies in general. In health care, however, hospitals and clinicians are the main actors who make decisions about the use of new therapies in patient care. Hence, clinicians contribute to this demand as well. This has also been the case in Tampere, as the clinical need has been the driving force for RM therapies and research and hospitals have been very active in creating the demand for this experimental therapy, which has not undergone any official clinical trials yet. As the development of RM therapies needs specialized tools, it also creates a demand. Solutions in the market are not always sufficient, and, hence, stem cell biology groups within academia have created a demand for better tools. As BioMediTech is a joint institute of two universities and there are research groups with technical disciplines in the Human Spare Parts programme, technology groups have been able to provide solutions to this internal demand from stem cell groups. In most industries, firms are the manufacturers of products and services. Here this is not yet the case. Instead, the universities and hospitals have been the main actors in the development of the new therapy and providing it to patients. In

order to proceed to the development phase of the RM cluster, the industrial sphere must take the lead.

The situation is currently positive in terms of new potential commercial offerings either for start-ups or established companies. Innovations created in BioMediTech (both tools and therapies) cannot be commercialized and brought to full-scale production without firms, and as scientific development advances, it will create more demand for different tools. Similarly, development of therapies requires full-scale production solutions. Hence, it seems that there are possibilities for the transition from the formation phase to the development phase of the cluster. However, for the future, an important question is whether the demand will grow big enough to attract investors and firms as well. Customers are in a key position in this as they create such a demand. Now academia is a customer for itself, but in the future, other customers will also be needed in order to develop the competence bloc.

Education and research

As in any university, education and research are two pillars in BioMediTech. There is also a third strong pillar, which is innovation promotion. Innovation is the key factor for possibilities for future economic activity in the RM sector in Tampere. As not all graduates are able to continue their studies as PhD students, the need for jobs is high and the supply of competent employees is secured. Regarding research, in recent years, one of the biggest research programmes in Tampere has been the Human Spare Parts research programme. In this programme, Tampere University of Technology and the University of Tampere combined their expertise in supporting technologies and stem cell biology. Together four groups from the field of technology and four groups from the field of stem cells joined the programme, in which the focus was on the advancement of health care with new therapies and solutions. In general, research groups in BioMediTech have a high rate of international collaboration.

The combination of stem cell research and technology expertise is important in advancing the RM sector. Because of this, it is possible to develop highly specialized solutions for stem cell research that are otherwise very difficult to find in the technology market. As these solutions have emerged from the research of BioMediTech, there are also other potential users for them, which creates opportunities for firms to grow and expand their product portfolio. The advantage is that researchers have already tested these new technological tools in practical work situations. These technologies are highly necessary in stem cell research and in subsequent applications. Hence, these form an important industry in the RM cluster, where other research groups in the RM sector are also potential customers internationally.

Hospitals are important in the RM sector, and research groups work in close collaboration with clinicians and hospitals, because this is the most efficient way to direct the research along the right path. The combination of university and hospital is also essential in order to provide bone growth therapy for patients. Currently, with regard to the utilized bone growth therapy, bone products are made in the university's clean room. From there the products are transferred to the hospital where hospital staff conduct clinical operations for patients. Without this close connection, it would be very difficult to see whether potential treatment really works. It is also beneficial for firms, as hospitals are experienced in working with stem cell-based products, which makes it easier for firms to approach them.

The interface structure between industry and academia is a part of the operations in BioMediTech as they approach industry directly. An important aspect in the emergence of the RM cluster in Tampere is the development of a proof of concepts (PoC) from the research of BioMediTech. With the PoC approach, BioMediTech is able to reduce the risk of failure in the technology transfer phase (Heinonen, 2015). According to an interviewee: "it is wise to stay in the university and conduct research, and progress until there is a clinical proof of concept". The development of PoCs is an efficient tool by which it is possible to combine technology and experience in the same package and transfer it to a firm. As the university is conducting the initial market studies and developing working prototypes, it is easier for firms to continue the development and be more prepared to exploit innovations commercially as well.

Legal and political sphere

BioMediTech and other organizations as well as firms, are part of the Finnish innovation system. This system consists of several organizations that are interlinked with each other. According to Kotiranta et al. (2009), even though there are several public organizations embedded in the national innovation system, only a few of them are relevant to the firms. Among those relevant organizations, the Technical Research Center of Finland (VTT) is relevant for large companies, and for all companies, universities and the Finnish Funding Agency for Technology and Innovation (TEKES) are relevant, according to the survey made by The Research Institute of the Finnish Economy (Kotiranta et al., 2009). Initiatives in Tampere are in line with the overall Finnish national innovation policy, which is rather technology-driven (Kotiranta et al., 2009). At ministry level, initiatives and actions are dependent on the political system, which also has implications at a governmental organization level. Hence, elections could radically change the chosen path. However, in Tampere the

exception was, as discussed in section 5.3 about demand, that clinical need triggered the scientific advances and the development of needed solutions. From the outset, regional actors have understood that to be in the front line, scientific and development efforts need to be focused, and one of the results of this was the establishment of BioMediTech and the Human Spare Parts research programme. Regional initiatives have had a strong influence and significance, and in a sense, the development of potential innovations was a bottom-up process that was first supported by regional development agencies and later by national-level innovation agencies.

In general, new therapies in the RM sector need to fulfil the regulatory requirements, including clinical trials, which has direct implications for both emerging firms and existing firms hoping to develop in the field of RM therapies. In the EU, it is possible to deliver RM therapies under a special ATMP hospital exemption, in which there is no need for clinical trials. National authorities are able to decide how many treatments it is possible to deliver with hospital exemption, and in Finland there is no strict limit in place. The ATMP hospital exemption is beneficial for the emergence of the RM sector in the EU, but for firms it is contradictory, as it makes it possible for governments to provide RM therapies with no clinical trials, and at the same time firms need to fulfil strict regulative requirements in order to exploit these commercially. In Tampere, ATMP hospital exemption is the way to provide treatments with bone growth innovation in RM. With regard to this therapy, there are plans to conduct official clinical trials in order to commercialize it. As regulatory approval is essential for new therapies, BioMediTech has a close connection with regulators in order to find a way to fulfil all requirements correctly. Even more, as one interviewee in BioMediTech said: “regulation has actually provided help to us”. Without regulation there would be always a little uncertainty how things should be done, and clear and efficient regulation might be a facilitator of medical innovation (Messenger & Tomlins, 2011). As the RM sector includes different technologies, not all of them are regulated as highly as stem cell therapies. Products that are solely for research purposes are not regulated at all. This enables technology transfer from BioMediTech to firms to take place more easily and faster.

Apart from developed technologies, use of the technologies also has consequences and challenges that are worth mentioning. For instance, it was essential for the first operations with regard to bone growth therapy, that the board of directors in the local hospital agreed and gave permission to conduct experimental treatment for patients (Mesimäki et al., 2009). However, the GMP level laboratory is crucial in the cases where cells for human treatment are prepared and, luckily, the GMP level laboratory and clean rooms were already in existence at the time of the first patients being

treated. In Finland, in those cases where clinicians did everything carefully, individual clinicians are not alone responsible if something goes wrong. This is an advantage for experimental therapies, as clinicians have more courage to perform operations. There are neither problems with public opinion nor high debate regarding their ethicality, which is very favorable for the use of stem cells in therapies.

Funding

Public funding is a key factor in the development of the RM sector in general, and specifically in the formation phase of the local cluster. In addition to the normal funding universities seek and receive for research, Regea and BioMediTech have received much public funding from TEKES, the Academy of Finland, the Council of Tampere Region, and the City of Tampere in order to develop the RM sphere in Tampere. For example, the Council of Tampere Region has provided funding for research facilities that have affected positively the progress in RM research. In 2011, BioMediTech received 10 million euros in funding from TEKES for the Human Spare Parts research programme for the years 2011–2014, which boosted the formation phase of the RM cluster in Tampere region significantly. Lately, TEKES granted another 4.5 million euros for the years 2015–2016. This basic funding for the Human Spare Parts research programme has made it possible to focus on long-term goals and strengthen collaborative structures between research groups.

The advantageous aspect for BioMediTech has been that TEKES funds PoC projects in order to facilitate technology transfer from university to industry. This allows BioMediTech to focus research commercialization on distinct projects that do not affect research projects too much. However, due to stable funding, it is possible in some cases to revert the PoC back to the research programme in order to develop it further. For future products that are based on university research, PoC development is essential. It is important to assess the market potential of these potential products, in order to transfer successfully innovation to industry. As PoC development is important, TEKES provides a financial instrument with which to achieve it. However, as stem cell products require long clinical trials, the financial aid that TEKES provides is not perfectly suitable, as TEKES requires faster outcomes, which are possible in the case of technological solutions. Even though RM cell therapy products are not suitable for PoC funding from TEKES, they are willing to support commercialization efforts in other ways. For example, with regard to bone growth therapy, there are plans to conduct studies toward clinical trials in collaboration with external partners and TEKES is willing to help financially in this process. However, for the development of RM therapies, it is particularly

important to have an endowment from which early clinical trials are funded in academia, as firms are unlikely to receive venture capital funding for early clinical trials, which are needed for a product to be approved. As one interviewee mentioned: “you can't establish a firm in too early stage. It is really expensive to operate a firm in this field, and it is the reason why venture capital is needed at some point". However, to conduct clinical trials in the university requires a lot of expertise and resources. Even though it is possible to develop products for scientific use at a much faster pace, for the future of the RM sector globally and related clusters, RM therapies are crucial.

Conclusions and implications

Prerequisite for the emergence of an RM cluster in Tampere is that academia is able to generate enough new knowledge and innovations for firms to use. A growing number of firms are able to exploit university-based innovations, which could lead to the emergence and growth of local firms. The RM sector requires multiple technology disciplines, which means that there might be several opportunities for firms to diversify. This eventually should lead the emergent cluster to a growth path due to the emergence of new firms and the growth (diversification) of existing firms, which subsequently leads to a situation where existing firms need new suppliers and service providers. The competence bloc in this process describes well how new firms emerge in the region and what it required. In the formation phase it seems to be especially important to get bigger companies involved as well, as those can act as industrialists for new companies later. The availability of industrialists is beneficial for both entrepreneurs and venture capitalists.

The main implications for policymakers concern requirements that are evidently important for the emergence of a science-based cluster and its further development from the formation phase to development phase. First, public funding is extremely important, as in the beginning there is no company structure investing in the future. A local cluster needs regionally specified funding schemes in order to conduct research in academia, but also to develop research-based innovations that can be transferred to companies. There should be appropriate funding to conduct early clinical trials in the universities as well, but it is also important to support the collaboration with industry from the very early phases of innovation. Second, collaboration among local agents (both public and private) is necessary in order to exploit fully the capacity in the region by, for instance, avoiding duplicity of efforts from related firms in undertaking a research/innovation project. International collaborations are also highly important in allowing learning, applying funding, and providing a wider demand, to mention just some examples.

Third, a growing number of firms is especially important for the local cluster. The science-based sector analysed here does not completely fit within the so-called linear model of innovation. On the contrary, it requires a complex interaction and prototyping between relevant actors. Therefore, the growth of firms might be supported by encouraging a practice-oriented environment and hence the use of emerging innovations would be more plausible.

In this study, some major challenges are pointed out regarding an emergent cluster, which call for tailor-made socio-economic policies at the meso-level. Science-based clusters obviously need tailored policies, as sectors are different, but related. Specific policies are also needed in different stages of the cluster life cycle, especially for an emergent cluster to proceed from the formation to the development phase and finally to become a matured cluster. With regard to the emergent RM cluster in Tampere, the development process is long and it might take still years to actually proceed from the formation phase to the development phase.

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Abstrakt (in Polish)

Klastry są istotnym elementem regionalnych gospodarek, a rozwijające się klastry mają szczególne znaczenie dla dywersyfikacji działalności gospodarczej poprzez nowe technologie i branże. Branże oparte na nauce są w tej dziedzinie szczególnie obiecujące dla tworzenia i wsparcia wizji rozwoju określonych terytoriów, dzięki innowacjom przełomowym lub wzbogaceniu obecnych modeli gospodarczych, działających w tradycyjnych sektorach. Branża medycyny regeneracyjnej (MR) stanowi przykład takich wyłaniających się klastrów. Branża ta jest silnie zależna od badań naukowych, co oznacza, że region musi inwestować w badania naukowe w tej dziedzinie, by spodziewać się określonego zwrotu z inwestycji. Regiony zazwyczaj nie posiadają rozwiniętych klastrów w dziedzinie MR, stąd branże te powinny wyłonić się z istniejących dziedzin działalności lub poszerzyć obecne sektory. Medycyna regeneracyjna angażuje szeroki zestaw technologii i sektorów, które mogą tworzyć klaster i korzystać z jego efektów, jeśli projekt odniesie sukces. W artykule zrealizowano dwa cele. Po pierwsze, przedstawiono bariery, które ograniczają rozwój młodych klastrów. Po drugie, określono w jaki sposób w klastrach tego rodzaju powstają innowacje i jakie jest ich znaczenie dla danego terytorium. Na podstawie przeglądu literatury przedstawiono rynek technologii i komercjalizacji w sektorze MR. Badanie empiryczne oparto na rozwijającym się klastrze MR w regionie Tampere, w Finlandii. Na podstawie 24 wywiadów przedstawiono kontekst tworzenia klastra w Tampere, gdzie sfera nauki inspiruje i stymuluje rozwój tej branży. Jednym z celów uniwersytetu jest komercjalizacja badań w dziedzinie MR, jakkolwiek na razie brak komercyjnych rezultatów. Badanie ma znaczenie dla zrozumienia rozwoju młodego klastra w branży opartej na nauce, w fazie zalążkowej i na wczesnych etapach rozwoju. Wskazano główne wyzwania dla powstającego klastra, które to wyzwania wymagają dostosowania polityki wsparcia na poziomie mezo-ekonomicznym. Dla klastrów opartych na wiedzy niezbędna jest ukierunkowana polityka, a określone sektory, na danym etapie rozwoju potrzebują specyficznych narzędzi polityki, aby osiągnąć fazę dojrzałości.

Słowa kluczowe: *medycyna regeneracyjna, wyłaniający się klaster, komercjalizacja, innowacja, blok kompetencji, rynek technologii.*

Biographical notes

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Entrepreneurial Growth Aspirations and Familiarity with Economic Development Organizations: Evidence from Canadian Firms

Angelo Dossou-Yovo[1]

Abstract

The purpose of this paper is to investigate the relationship between the entrepreneurship ecosystem and the entrepreneur's willingness to grow. This study is particularly interested in exploring the relationship between entrepreneur's familiarity with the key economic development organizations in the entrepreneurship ecosystem and the willingness to grow. Several studies have investigated the growth process in small and medium sized enterprises (SMEs) since the case has been made that high growth SMEs contribute to economic growth through job creation. To date, these studies have identified multiple internal and external determinants including their effects on small business growth. There is evidence in the literature that characteristics of the entrepreneurs such as the willingness to grow and the entrepreneur's network are important factors in growth process. However, the relationship between growth process and the entrepreneur's networking behavior is yet to be fully understood. Drawing from the entrepreneurship ecosystem literature, the growth process literature and the resource dependence theory, this study uses the business confidence survey from 2011 to 2013, which targeted all businesses across all of Halifax Regional Municipality (HRM) in Nova Scotia, Canada, to explore the relationship between the entrepreneur willingness to grow and the propensity to network with key economic development organizations of the entrepreneurial ecosystem. The findings support the assumption that the proportion of businesses that are willing to grow (i.e. hire additional staff and enter new markets within the next twelve months) is higher for the group of businesses that are familiar with the key economic development organizations than for the group of businesses that are not familiar with them. However, the results are not homogeneous across all populations. Our findings also indicate that the higher the expectation to enter new markets over the next twelve months, the higher the odds to be familiar with the key economic development organizations. Our findings contribute to the literature around the association between networking and small business growth.

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Keywords: *growth process, small business, entrepreneurial ecosystem, networking, Canada*

Introduction

For many decades, policy makers have been looking for effective economic policies to boost economic growth. Since it has been demonstrated that the entrepreneurial system is a key driver of economic growth (Spilling, 1996), policies have shifted to focus on entrepreneurs and small and medium-sized enterprises (SMEs), especially high growth SMEs which are known for their high share of job creation (Storey and al., 1988). These small businesses are also called 'gazelles' as they grow rapidly (i.e. annual growth rate of 20% or higher) but they represent between 3 to 5% of the population of small businesses (Birch, 1987). In order to increase the number of 'gazelles', public policy makers are now embracing the entrepreneurship ecosystem approach as an alternative to the transactional form of support (Mason & Brown, 2014). Mason and Brown argue that public policies that use a holistic approach (Isenberg, 2010) and which focus on the environment, represented as the entrepreneurship ecosystem, are more effective than transactional forms of support such as financial assistance. Although external factors, such as the entrepreneurship ecosystem, influence small business growth, there is also evidence in the literature that characteristic of the entrepreneur such as his/her willingness to grow (Davidsson 1989, Kolvereid, 1990, Gundry & Welsch, 1997; Cooper et al., 1994) is an important factor in growth process. One of the important factors for a thriving entrepreneurship ecosystem is the presence of entrepreneurs, but those that can identify and exploit unique and scalable opportunities which translate into high value creation such as wealth for the business and jobs.

The purpose of this paper is to investigate the relationship between the entrepreneurship ecosystem and the entrepreneur's willingness to grow. This paper presents the results of the preliminary stage of a broader research project about the process of small business growth. In this study, the main research question is: Does the entrepreneur's willingness to grow affect familiarity with key actors in the entrepreneurial ecosystem such as economic development organizations? We are assuming that the entrepreneur that is willing to grow would start networking (i.e. developing relationships) with key economic development organizations in order to get access to the external resources (for instance the business support services) for growth. Although other studies have investigated the small business growth process and have identified multiple internal (e.g. Barkham et al., 1996; Baum & Locke, 2004; Baum & al, 2001; Birley & Stockley, 2000;

Chandler & Janse, 1992; Davidson, 1991) and external determinants (e.g. Becchetti & Trovato, 2002; Chandler & Hanks, 1994); very few studies, to our knowledge, have investigated the determinants by combining internal and external factors.

This study uses the case of Halifax Regional Municipality (HRM) located in the province of Nova Scotia (Canada). The region of Halifax is the most densely populated region with a population of 414,398 whereas the total population of the province is 942,668 (Statistics Canada, 2014). The province of Nova Scotia currently faces several challenges such as a shrinking population and a declining economy. Halifax metropolitan area is the main economic driver of Nova Scotia which faces many economic challenges including the growth of small and medium enterprises. The majority of the businesses are small and medium sized and the lack of available jobs make it difficult to refrain the young people from moving out of the province. According to the definition of Statistics Canada, a small business has between 1 to 99 employees whereas a medium sized business has between 100 to 499 employees. The growth of small and medium enterprises (SME) is a priority for public authorities as they generate most of the jobs compared to large companies.

The rest of the paper is organized as follows. In section 2, the literature on entrepreneurship ecosystem, the process of small business growth and the resource dependency perspective are reviewed and then we hypothesized a relationship between the entrepreneur willingness to grow and familiarity with the key economic development organizations of the entrepreneurship ecosystem. In section 3, we describe the data and the methodology used in this paper, then, in the following section, we present the results of the analyses that have been undertaken to explore our hypotheses. The discussion of the results along with the conclusions and implications for managers of the key economic development organizations and policymakers are presented in the last section of this paper.

Entrepreneurship ecosystem, economic development organizations and their functions

Definition and components

The entrepreneurship ecosystem is a concept that has been brought forward in the literature recently. According to Vogel (2013, p.7) the term ecosystem was originally introduced by ecologists and subsequently by James Moore in his article published during the 1990s in Harvard Business review (Mason & Brown, 2014, p.5). There are a number of definitions available in the literature. For the purpose of our study, we use the definition of Mason

and Brown (2014) which have been suggested as a synthesis of the existing definitions in the literature.

Entrepreneurship ecosystem is "[…] a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sectors agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, number of high growth firms, level of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment" (Mason & Brown, 2014, p. 5).

Several models have been suggested to conceptualize the entrepreneurial ecosystem. Isenberg (2010) has suggested a model which consists of 13 essential elements that can be used as a framework to assess the entrepreneurship ecosystem. The essential elements are as follows: public leaders, governments, culture, visible success stories, knowledge people, capital sources, nonprofits and industry associations, educational institutions, public infrastructures, geographic location, formal and informal groups, venture-oriented professionals and potential customers. Vogel (2013) proposed a similar framework to assess the effectiveness of an entrepreneurship ecosystem. He organized this framework into components and subcomponents, namely: non-entrepreneurship-specific level (government and regulations, geographic location, markets), entrepreneurship-specific level (financing, culture, visibility, support, education, networks) and entrepreneurial actors (novice and social entrepreneurs). In their study of the components of the entrepreneurship ecosystem that influence the development of high-technology entrepreneurial activity at Boulder, Colorado, Neck and al. (2004) have found that the components, such as incubator organizations, spin-offs, informal and formal networks, the physical infrastructure, and the culture collectively play an important role. These different aforementioned models integrate a set of actors that play an important role in the development of an entrepreneurship ecosystem. The next section will take a closer look at the actors and their roles which we conceptualize further as functions, with the use of the system approach.

Actors and functions

The components of the entrepreneurship ecosystem suggested by several authors (Neck and al., 2004; Vogel, 2013; Cohen, 2006; Isenberg, 2010) include a group of actors that provide specific resources which contribute to

its growth. These actors are generally located in the same region and are the suppliers of key resources that influence the growth of the entrepreneurship ecosystem.

The resources accessible in the entrepreneurship ecosystem are as follows:

- information and financial support are available through informal connections with friends, families, colleagues and others (informal network),
- knowledge and other forms of support are available through connections and collaboration with universities, public agencies, economic development organizations and large corporations,
- professional and support services are available through collaboration with lawyers, accountants, consultants, suppliers, etc.,
- sources of capital are provided by venture capitalists and angel investors.

The entrepreneurship ecosystem, although a new approach, incorporates many of the themes of the regional innovation system literature (Masson & Brown, 2014, p.7). Using the system approach, the entrepreneurial ecosystem can be considered as a system with a group of actors (components) that play specific roles (functions) which collectively maintain and improve the health of the overall system.

In the region of Halifax, which is our focus of study, the economic development organizations are among the key actors. These actors are: The Greater Halifax Partnership, Nova Scotia Business Incorporated, Department of Economic and Rural Development and Tourism, The Atlantic Canada Opportunities Agency.

- Greater Halifax Partnership (GHP) is a public-private partnership including over 135 private investors, which was created in 1996 in order to face the economic challenges of the province. Its mandate is to keep and grow existing businesses. GHP's main activities include business retention and expansion, immigration, trade development, business recruitment, business research and building confidence. GHP, through its Smart Business program, offers a range of services to businesses that include connections to partners such as recruiting and training experts, to research and development institutions, and to other partners that can contribute to business expansion and growth. GHP has also a team that provide advisory services or incentives to stay, especially for businesses that may leave Halifax.
- Nova Scotia Business Incorporated (NSBI) is a crown corporation created in 2001 by the Nova Scotia Incorporated Act. Its mandate is to support economic growth through (a) business development, retention and expansion, (b) the establishment of new businesses in the province, (c) trade operation to connect businesses in the province

with new markets or new trade opportunities (Crown Corporations business plan 2015-2016, p.45). NSBI fulfills its mandate through collaborations with regional enterprise networks, municipalities, Greater Halifax Partnership, chambers of commerce, businesses, universities and other public agencies. NSBI provides business advisory services to local businesses that are looking to expand their operations either through the development of a new product/service or market expansion. NSBI also offers financial support to cover part of the travel expenses and other costs to participate in international trade shows and conferences.

- The Department of Economic and Rural Development and Tourism (ERDT) is a provincial government body with the mission 'to provide strategic leadership and advice, to enhance collaboration with partners and stakeholders in economic and community development, and tourism, and to create the right conditions for entrepreneurship and businesses to grow and prosper across Nova Scotia' (ERDT Statement of mandate 2014-2015, p.5). ERDT provides funding support to businesses through its Job fund. The government of Nova Scotia has announced on April 9th, 2015 the replacement of ERDT with a new department of business.
- The Atlantic Canada Opportunities Agency (ACOA) is a federal government body that was created in 1987 to provide economic development services in all four provinces in the Canadian Atlantic region. ACOA provides services to businesses through a variety of programs that support business innovation and growth. The Atlantic Innovation Fund provides funding support to businesses in order facilitate joint product development and commercialization of new products with universities, colleges and other research universities. The business development program provides funding support for starting and expanding a business.

Table 1 summarized the main functions of business development organizations that contribute to small business growth.

Table 1. The main functions of business development organizations that contribute to small business growth

Organizations	Functions contributing to business growth
Greater Halifax Partnership	Recruitment services and connections with partners (local and international)
NSBI	Business advisory services, and financial support for market expansion
ERDT	Funding support
ACOA	Funding support for innovation and business expansion

The entrepreneur's growth aspirations, networking behavior, and resource mobilization

Small businesses generally grow organically (Davidson et al. 2005) and need to mobilize key resources in the process. An empirical study conducted by Jarillo (1989) found that fast growing firms use more external resources than their competitors. In addition, they gain access to the external resources for growth through networking. Lewis and Churchill (1987) proposed a model of small business growth which consists of five stages: existence, survival, success, take-off and resources maturity. During growth process, eight factors will influence the outcomes. The first four are as follows: financial resources, personal resources, system resources and business resources. The remaining four are related to the owner and are as follows: goals for himself/herself and for the business, his/her operational abilities, his/her managerial ability and willingness to delegate, and his/her strategic abilities. Storey (1994) also found that internal factors such as the characteristics of the entrepreneur, the characteristics of the small business and the development strategies, have an impact on growth outcomes. Other studies have also showed the importance of external (e.g. Becchetti & Trovato, 2002; Chandler & Hanks, 1994) and internal factors (e.g. Barkham et al., 1996; Baum & Locke, 2004; Baum & al., 2001; Birley & Stockley, 2000; Chandler & Janse, 1992; Davidsson, 1991) during the process of growth. The characteristic of the entrepreneurs such as his/her willingness to grow (Davidsson 1989, Kolvereid, 1992, Gundry & Welsch, 1997; Cooper et al., 1994) is an important factor in the growth process.

Since fast growing small businesses rely on external resources, the external environment is therefore an important factor. Drawing from the resource dependence theory, the business environment can be considered as a reservoir of resources for small business growth. In their seminal paper, "The external control of organizations: a resource dependence perspective", Pfeffer and Salancik (1978) introduced the resource dependency theory as an alternative to the rational model of organization and organizational design. The resource dependency perspective views the organization as an entity that is dependent upon its environment for critical resources. The survival of organizations depends on their ability to not only attract the scarce resources in their environment but also develop strategies to gain control over the resources. Such goal can be achieved through coalitions and collaborations with other organizations, which involve giving up independence to acquire the key resources (raw materials, labor, capital, equipment, knowledge and markets). Firms such as small businesses are vulnerable to resources shortage in their early growth stage. They can enhance their prospects for survival

when they get support from their environment and if the founders are able to build partnerships and alliances (Garnsey, 1998).

The growth process starts with the willingness of the entrepreneur to grow and to network with actors in the entrepreneurial ecosystem. In our study, the willingness to grow refers to the expectations to introduce a new product/service, or to increase sales, or to hire additional staff, or to invest in new facilities/equipment, or to enter new markets within the next twelve months. In addition, we consider the entrepreneurship ecosystem as the reservoir of resources available through the functions realized by different actors. Therefore, it is reasonable to expect that the proportion of businesses that are willing to grow would be higher for the group that is familiar with the key economic organizations than for the group that is not familiar with them, under the assumption that familiarity with the economic development actors facilitates access to the key external resources for growth. In our study, we are focusing on four key economic development organizations (GHP, NSBI, ERDT, ACOA). Thus, we state the following hypotheses to test the relationship between familiarity with the key economic organizations and the willingness to grow:

H1: *There is a relationship between familiarity with GHP (or NSBI or ERDT or ACOA) and the expectations to introduce a new product or service, or to increase sales, or to hire additional staff, or to invest in new facilities/equipment, or to enter new markets within the next twelve months.*

H2: *The proportion of businesses that expect to introduce a new product or service, or to increase sales, or to hire additional staff, or to invest in new facilities/equipment, or to enter new markets within the next twelve months is higher for the group of businesses that are familiar with GHP (or NSBI, or ERDT, or ACOA).*

Research methods

Sample

The data used in this study come from the business confidence surveys, which were administered by a private consultant on behalf of the Greater Halifax Partnership. The survey is administered by telephone twice a year (two waves) during the periods of Spring and Autumn. The trained interviewers take 15 minutes to complete each interview. A total number of 350 interviews were completed for each wave out of 3357 telephone numbers attempted. The current study focuses on four waves that cover the periods from 2011 to 2013. The data to be used in this article represent 1400 companies (see

Table 2 for the number of respondents per wave). All companies surveyed are located in the region of Halifax and belong to a very broad range of industries.

Table 2. The number and sex of respondents per survey wave

		Wave			
		2011 Autumn	**2012 Spring**	**2012 Autumn**	**2013 Spring**
Gender	Male	214	222	205	202
	Female	136	128	145	148
	Subtotal	350	350	350	350

The data have been collected by categories and the dataset reports the number of counts for each category; therefore, multivariate technique was not appropriate. We conducted a series of contingency table analyses, then we used a binary logistic regression model to explore the association between the variables of interest. We were then able to test the null hypothesis that there is no association between familiarity with GHP (NSBI, ERDT, ACOA) and the expectations to introduce a new product or service, to increase sales, to hire additional staff, to invest in new facilities or equipment and to enter new markets within the next twelve months. The contingency table analysis method is appropriate to test the association between two categorical variables (Agrestic & Kateri, 2011; Conniver, 1980).

Variables and analyses

In order to analyze the association between familiarity with the key economic development organizations and the willingness to grow, we considered the expectations to introduce a new product or service, to increase sales, to hire additional staff, to invest in new facilities or equipment and to enter new markets within the next twelve months. All these variables are related to growth indicators such as sales, assets, physical output, employment, market share and profits that are among the most frequently used in the literature dealing with the measure of growth (Davidson et al. 2005). The variable *Familiarity with a key economic development organization* indicates the level of awareness of its existence, its mandate and the business support services available for small businesses.

In the first step, we conducted a series of contingency table analyses for each organization with the columns representing respectively familiarity with the key economic development organization (i.e. GHP, NSBI, ERDT, ACOA) and the rows representing respectively the expectations to introduce a new product or service, to increase sales, to hire additional staff, to invest in new facilities or equipment and to enter new markets within twelve months.

In the second step, we used a binary logistic regression model considering familiarity with key economic development organizations as dependent variable and the willingness to grow as independent variable.

Potential limitations

Like any other research, this study has its limitations due to the constraints associated with the dataset. The data were collected per wave and there was no systematic follow up with previous respondents. This implies that a longitudinal study is not appropriate. In addition, we are dealing with categorical data, therefore we are limited in the number of options available to do further analysis of the data. Other limitations are related to the sample size and to the fact that the primary data are self- reported. Finally, the measure used for the willingness to grow does not necessary capture the overall picture. Although this research provides some good insights on the subject of study, further research such as a qualitative study would contribute to validate our findings.

Results

Test of associations

Firstly, we conducted a series of contingency table analyses using the sample from all waves. Secondly, we conducted the same analyses separately for each wave to find out if the results vary over time.

The findings from the first series of contingency table analyses (see Tables 3 and 4) indicate that there is no association between familiarity with all key economic development organizations (GHP, NSBI, ACOA, ERDT) and the expectation to introduce a new product or service, to increase sales and to make a major investment in facilities or equipment. The results were not significant; therefore, the null hypothesis cannot be rejected. We came to the same conclusions concerning the association between familiarity with GHP, ACOA and ERDT and the expectation to hire more staff except for NSBI (See Table 4). An association between familiarity with NSBI and the expectation to hire additional staff was found (Chi-square=4.269; $P<0.05$). The findings from Table 3 indicate that the proportion of the firms that expect to hire additional staff is higher in the case of the firms that are familiar with NSBI (61.4%) than in the case of those that are not familiar with NSBI (55.8%).

Table 3. Familiarity with economic development organizations and growth aspirations - number of responses

		Familiarity with GHP		Familiarity with NSBI		Familiarity with ACOA	
		Not familiar	Familiar	Not familiar	Familiar	Not familiar	Familiar
Over the next 12 months in your HRM business operations, do you expect that your company will: Introduce a new product or service?	Yes	337	350	392	294	324	361
	No	332	322	381	271	282	369
Over the next 12 months in your HRM business operations, do you expect that your company will: Enter a new market?	Yes	159	231	186	204	141	249
	No	505	424	580	350	454	474
Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Yes	244	228	280	194	222	252
	No	423	436	490	367	384	471
Over the next 12 months in your HRM business operations, do you expect that your company will: Increase sales?	Yes	527	542	620	448	477	587
	No	122	127	129	119	111	139
Over the next 12 months in your HRM business operations, do you expect that your company will: Hire additional staff?	Yes	377	380	416	340	337	418
	No	276	267	330	213	250	293

In Table 4, the chi-square tests for GHP (Chi-square=20.294; P<0.001), for NSBI (Chi-square=24.291; P<0.001), for ACOA (Chi-square=18.078; P<0.001) and for ERDT (Chi-square=16.199; P<0.001) reject the null hypothesis that there is no association between familiarity with key economic development organizations and the expectation to enter a new market over the next twelve months. The findings from Table 3 indicate that the proportion of the firms that expect to enter new markets is higher in the case of the firms that are familiar respectively with GHP (35.3%), NSBI (36.8%), ACOA (34.4%), ERDT (35.8%) than in the case of those that are not familiar respectively with GHP (23.9%), NSBI (24.3%), ACOA (23.7%), ERDT (25.5%).

Table 4. Familiarity with economic development organizations and growth aspirations – Pearson Chi-Square Tests

Pearson Chi-Square Tests					
		Familiarity with GHP	**Familiarity with NSBI**	**Familiarity with ACOA**	**Familiarity with ERDT**
Over the next 12 months in your HRM business operations, do you expect that your company will: Introduce a new product or service?	Chi-square	0.392	0.229	2.135	0.101
	Df	1	1	1	1
	Sig.	0.531	0.632	0.144	0.751
Over the next 12 months in your HRM business operations, do you expect that your company will: Enter a new market?	Chi-square	20.294	24.291	18.078	16.199
	Df	1	1	1	1
	Sig.	.000*	.000*	.000*	.000*
Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Chi-square	0.732	0.45	0.455	1.693
	Df	1	1	1	1
	Sig.	0.392	0.502	0.5	0.193
Over the next 12 months in your HRM business operations, do you expect that your company will: Increase sales?	Chi-square	0.007	2.991	0.015	0.829
	Df	1	1	1	1
	Sig.	0.931	0.084	0.902	0.363
Over the next 12 months in your HRM business operations, do you expect that your company will: Hire additional staff?	Chi-square	0.133	4.269	0.252	0.426
	Df	1	1	1	1
	Sig.	0.715	.039*	0.616	0.514

*. The Chi-square statistic is significant at the .05 level.

The findings from the second series of contingency tables, which focus on separate samples (sample per wave), indicate that there is no association between familiarity with key economic development organizations and the expectations to introduce a new product or service, to make a major investment in facilities or equipment and to increase sales. The results of the chi-square tests are consistent over the four waves and indicate that the null hypothesis cannot be rejected (see Tables 5, 7, 9). These results confirm the findings of the first series of contingency tables analyses.

The results displayed in Table 8 also indicate that the same conclusion is applicable to the association between familiarity and the expectation to hire additional staff except for NSBI, but only for 2013 spring wave. The results (chi-square=6.139; $P<0.05$) reject the null hypothesis that there is no association between familiarity with NSBI and the expectation to hire more additional staff. In the 2013 spring sample, the proportion of firms that

expect to hire additional staff is higher for the firms that are familiar with NSBI (66.1%) than that of the firms which are not familiar with NSBI (52.4%). The results displayed in Table 6 indicate a variation of the results for the tests of the association between familiarity with GHP, NSBI, ACOA, ERDT and the expectation to enter a new market, depending on the organization and the wave. The results from the 2013 spring wave reject the null hypothesis. On the contrary, the results from the 2011 autumn wave indicate that the null hypothesis cannot be rejected. In addition, the results from the 2012 spring wave reject the null hypothesis only for NSBI and ACOA. Finally, the results from the 2012 spring wave reject the null hypothesis only for NSBI and ERDT. We can conclude that the association between familiarity with the key economic organizations and the expectation to enter a new market is not validated over the four waves.

Table 5. Pearson Chi Square Test for the association between familiarity with business development organizations and the expectation to introduce a new product or service

		2011 Autumn	2012 Spring	2012 Autumn	2013 Spring
		Over the next 12 months in your HRM business operations, do you expect that your company will: Introduce a new product or service?			
Familiarity with GHP	Chi-square	1.463	0.337	0.363	1.449
	df	1	1	1	1
	Sig.	0.226	0.562	0.547	0.229
Familiarity with NSBI	Chi-square	2.274	0.747	1.792	0.002
	df	1	1	1	1
	Sig.	0.132	0.387	0.181	0.968
Familiarity with ACOA	Chi-square	1.064	0.289	0.506	0.188
	df	1	1	1	1
	Sig.	0.302	0.591	0.477	0.665
Familiarity with ERDT	Chi-square	0.013	0.783	0.508	0.621
	df	1	1	1	1
	Sig.	0.911	0.376	0.476	0.431

Table 6. Pearson Chi Square Test for the association between familiarity with business development organizations and the expectation to enter a new market

		Wave			
		2011 Autumn	2012 Spring	2012 Autumn	2013 Spring
		Over the next 12 months in your HRM business operations, do you expect that your company will: Enter a new market?			
Familiarity with GHP	Chi-square	2.405	3.587	3.765	13.032
	Df	1	1	1	1
	Sig.	0.121	0.058	0.052	.000*
Familiarity with NSBI	Chi-square	1.527	8.836	4.797	13.093
	Df	1	1	1	1
	Sig.	0.217	.003*	.029*	.000*
Familiarity with ACOA	Chi-square	1.215	1.854	7.612	10.685
	Df	1	1	1	1
	Sig.	0.27	0.173	.006*	.001*
Familiarity with ERDT	Chi-square	0.789	6.781	1.187	11.592
	Df	1	1	1	1
	Sig.	0.375	.009*	0.276	.001*

*. The Chi-square statistic is significant at the .05 level.

Table 7. Pearson Chi Square Test for the association between familiarity with business development organizations and the expectation to increase sales

		Wave		
		2011 Autumn	2012 Spring	2013 Spring
		Over the next 12 months in your HRM business operations, do you expect that your company will: Increase sales?		
Familiarity with GHP	Chi-square	0.059	0.244	0.361
	df	1	1	1
	Sig.	0.809	0.622	0.548
Familiarity with NSBI	Chi-square	0.757	0.882	3.918
	df	1	1	1
	Sig.	0.384	0.348	.048*
Familiarity with ACOA	Chi-square	0.913	2.163	0.014
	df	1	1	1
	Sig.	0.339	0.141	0.906
Familiarity with ERDT	Chi-square	1.422	0.01	1.015
	df	1	1	1
	Sig.	0.233	0.922	0.314

*. The Chi-square statistic is significant at the .05 level.

Table 8. Pearson Chi Square Test for the association between familiarity with business development organizations and the expectation to hire additional staff

		Wave		
		2011 Autumn	2012 Spring	2013 Spring
		Over the next 12 months in your HRM business operations, do you expect that your company will: Hire Hire additional staff?		
Familiarity with GHP	Chi-square	0	0.001	0.686
	df	1	1	1
	Sig.	1	0.979	0.407
Familiarity with NSBI	Chi-square	0.159	0.839	6.139
	df	1	1	1
	Sig.	0.69	0.36	.013*
Familiarity with ACOA	Chi-square	0.117	0.027	0.002
	df	1	1	1
	Sig.	0.732	0.87	0.966
Familiarity with ERDT	Chi-square	0.002	0.13	0.173
	df	1	1	1
	Sig.	0.967	0.718	0.677

*. The Chi-square statistic is significant at the .05 level.

Table 9. Pearson Chi Square Test for the association between familiarity with business development organizations and the expectation to make a major investment in facilities and equipment

Wave			Familiarity with GHP	Familiarity with NSBI	Familiarity with ACOA	Familiarity with ERDT
2011 Autumn	Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Chi-square	.251	2.561	.164	.816
		df	1	1	1	1
		Sig.	.616	.110	.686	.366
2012 Spring	Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Chi-square	.089	.035	.181	.038
		df	1	1	1	1
		Sig.	.766	.852	.671	.846
2012 Autumn	Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Chi-square	.001	.231	.096	2.215
		df	1	1	1	1
		Sig.	.971	.631	.756	.137
2013 Spring	Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment?	Chi-square	1.016	.044	.037	.154
		df	1	1	1	1
		Sig.	.314	.833	.848	.694

Logistic regression

A binary logistic regression model was used considering the dependent variables that represent familiarity with economic development organizations (familiarity with GHP, NSBI, ACOA and ERDT) and the independent variables that represent the willingness to grow (the expectations to introduce a new product or service, to increase sales, to hire additional staff, to make a major investment in facilities or equipment and to enter a new market). The description of the variables is provided in Table 10. In Table 11, the dependent variable is 'familiarity with GHP' which comprises two categories: *familiar=1* and *Not familiar=0.* The five independent variables representing the willingness to grow are as follows: the expectations to introduce a new product or service (*Yes=1*; *No=0*), to make a major investment in facilities or equipment (*Yes=1*; *No=0*), to increase sales (*Yes=1*; *No=0*), to hire additional staff (*Yes=1*; *No=0*), to enter a new market (*Yes=1*; *No=0*).

Table 10. The description of variables

Variables	Label
	Dependent variables
q16a	Familiarity with GHP (1='Familiar'; 0='Not Familiar')
q16b	Familiarity with NSBI (1='Familiar'; 0='Not Familiar')
q16c	Familiarity with ACOA (1='Familiar'; 0='Not Familiar')
q16d	Familiarity with ERDT (1='Familiar'; 0='Not Familiar')
	Independent variables
q11a	Over the next 12 months in your HRM business operations, do you expect that your company will: Introduce a new product or service? (1='Yes'; 0='No')
q11b	Over the next 12 months in your HRM business operations, do you expect that your company will: Enter a new market? (1='Yes'; 0='No')
q11c	Over the next 12 months in your HRM business operations, do you expect that your company will: Make a major investment in facilities or equipment? (1='Yes'; 0='No')
q11e	Over the next 12 months in your HRM business operations, do you expect that your company will: Increase sales? (1='Yes'; 0='No')
q11f	Over the next 12 months in your HRM business operations, do you expect that your company will: Hire additional staff? (1='Yes'; 0='No')

The same independent variables were used in the other models involving the dependent variables: 'familiarity with NSBI', 'familiarity with ACOA', 'familiarity with ERDT'. The results in Table 11 show statistical significance ($p<0.001$) on all models for the expectation to enter a new market over the next twelve months. The B coefficients indicate that the higher the expectation to enter a new market over the next twelve months, the higher the odds to be

familiar with GHP, NSBI, ACOA and ERDT. The odd ratios tell us that businesses that do expect to enter a new market over the next twelve months are more likely to be familiar with GHP (1.69 times), NSBI (1.79 times), ACOA (1.68 times) and ERDT (1.62 times) than those that do not. The results from the logistic regression confirm the results from the tests of association that there is an association between familiarity with all key economic development organizations (GHP, NSBI, ACOA, ERDT) and the expectation to enter a new market. In addition, the findings in Table 13 indicate that businesses that do expect to introduce a new product or service over the next twelve months are significantly less likely to be familiar with ACOA than those that do not. However, these results should be taken with caution as the R^2 values indicate that the models explain only between 1.3 to 2.2% of the variations.

Table 11. The binary logistic regression models for the dependence between growth aspirations and familiarity with economic development organizations

Model 1: Dependent variable: Familiarity with GHP						
Independent variables	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
q11a(1)	-.084	.131	.406	1	.524	.920
q11b(1)	.523	.142	13.620	1	.000	1.687
q11e(1)	.050	.166	.093	1	.761	1.052
q11c(1)	-.154	.135	1.313	1	.252	.857
q11f(1)	-.013	.140	.009	1	.926	.987
Constant	-.026	.141	.033	1	.856	.975
Omnibus test of Model Coefficients	(Chi-square=14.639; 5df; P<0.05)					
- 2 Log likelihood	1529.923					
Cox and Snell R square	.013					
Model 2: Dependent variable: Familiarity with NSBI						
Independent variables	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
q11a(1)	-.090	.133	.452	1	.501	.914
q11b(1)	.580	.142	16.721	1	.000	1.786
q11e(1)	-.395	.167	5.565	1	.018	.674
q11c(1)	-.213	.137	2.437	1	.118	.808
q11f(1)	.276	.142	3.752	1	.053	1.317
Constant	-.132	.142	.865	1	.352	.876
Omnibus test of Model Coefficients	(Chi-square=25.070; 5df; P<0.001)					
- 2 Log likelihood	1501.973					
Cox and Snell R square	.022					

Model 3: Dependent variable: Familiarity with ACOA						
Independent variables	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
q11a(1)	-.296	.133	4.983	1	.026	.744
q11b(1)	.516	.143	12.926	1	.000	1.675
q11e(1)	.012	.167	.005	1	.942	1.012
q11c(1)	-.150	.136	1.228	1	.268	.860
q11f(1)	.050	.141	.128	1	.720	1.052
Constant	.241	.142	2.884	1	.089	1.272
Omnibus test of Model Coefficients	(Chi-square=15.620; 5df; P<0.01)					
- 2 Log likelihood	1510.890					
Cox and Snell R square	.014					
Model 4: Dependent variable: Familiarity with ERDT						
Independent variables	**B**	**S.E.**	**Wald**	**Df**	**Sig.**	**Exp(B)**
q11a(1)	-.160	.134	1.426	1	.232	.852
q11b(1)	.476	.142	11.247	1	.001	1.610
q11e(1)	.207	.171	1.461	1	.227	1.230
q11c(1)	.121	.137	.781	1	.377	1.128
q11f(1)	-.115	.143	.646	1	.422	.892
Constant	-.627	.147	18.282	1	.000	.534
Omnibus test of Model Coefficients	(Chi-square=14.970; 5df; P<0.05)					
- 2 Log likelihood	1484.264					
Cox and Snell R square	.013					

Discussion and conclusions

In this preliminary stage of a broader research project about the process of small business growth, the main research question is: Does entrepreneur's willingness to grow affect familiarity with key actors in the entrepreneurial ecosystem such as the key economic development organizations? To investigate this research question, we focused on the case study of Halifax Regional Municipality in Nova Scotia (Canada), where the four key economic development organizations are GHP, NSBI, ERDT and ACOA. Firstly, we started with investigating the association between the variables of interest. Secondly, we investigated the effect of the willingness to grow on familiarity with the key economic development organizations. Our analyses show, in general, that there is a relationship between familiarity with the key economic development organizations such as GHP, NSBI, ACOA, and ERDT and the willingness to grow. However, these results are not valid for all the variables

that we considered as measures of the willingness to grow. In addition, the results are not homogeneous across the waves.

The findings provide support for the relationship between familiarity with a key economic organization and the expectation to hire additional staff or enter new markets within the next twelve months. The findings also support the assumption that the proportion of businesses that expect to hire additional staff within the next twelve months is higher for the group of businesses that are familiar with NSBI. The functions identified for Nova Scotia Business Incorporated (NSBI) consist of business advisory services and financial support for market expansion. The business advisory services include support for hiring by connecting businesses with partners or consultants and providing funding support through NSBI payroll rebate program. Although the results are not homogeneous across all waves, the findings indicate that the proportion of businesses that expect to enter new markets within the next twelve months is higher for the group of businesses that are familiar with GHP or NSBI or ACOA or ERDT. In addition, the higher the expectation to enter a new market over the next twelve months, the higher the odds to be familiar with GHP, NSBI, ACOA and ERDT. All four organizations provide business support services for market expansion through their functions in the entrepreneurial ecosystem.

The findings suggest that the entrepreneur' networking behavior may be affected by the business growth strategies. Therefore, the research questions that emerge from the findings are: What business support services are the most effective to stimulate small business growth? How does the entrepreneur's network evolve throughout the growth process? These are questions that we intend to investigate further. The results also indicate that a substantial proportion of businesses are still unaware of the resources that are available through the key economic development organizations. The findings have implications for the key economic development organizations. The managers of the economic development organizations need to find more efficient ways to raise awareness about their functions in the entrepreneurial ecosystem. In addition, our findings inform public policy makers about the type of business supports services that are related to small business growth.

As already stated in the research method section, this study has its limitations. However, our findings are consistent with the results from previous empirical studies as they confirm the relationship between networking and small business growth (Hansen & Hamilton, 2011; Larson, 1992; Watson, 2007). Hansen and Hamilton (2011) investigated the factors that differentiate growers from non-growers. They found that the use of private business networks is one of the factors that differentiate the two groups. The owner managers of the growth businesses see more value in networking than the

owner managers of the non-growth businesses. Watson (2007) examined the impact of personal networks on firm performance, especially for established businesses, and found a significant association between formal networks and small business growth. However, the informal relationships have been found to be more effective in network dyads (Larson, 1992). Small business owners are able to gain access to the external resources for growth as long as they are able to develop the adequate relationships with the relevant actors. In our study, we found a significant association between "familiarity with NSBI" and the small business owner's expectations to hire additional staff. Similarly, our findings indicate that the higher the expectation to enter a new market over the next twelve months, the higher the odds for the small business owner to be familiar with GHP, NSBI, ACOA and ERDT. Considering that NSBI provides advisory services for hiring and that all four economic development organizations provide business support services for market expansion then, it is reasonable to expect that small businesses owners will more likely develop relationships with the actors in the entrepreneurial ecosystem that meet their needs for growth.

Future research using a comparative analysis of different geographic locations may contribute to investigate the relationship between the entrepreneur's familiarity with the economic development organizations of the entrepreneurship ecosystem and the willingness to grow.

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Abstrakt (in Polish)

Celem artykułu jest zbadanie relacji między tworzeniem powiązań sieciowych i aspiracjami wzrostowymi. Przedstawione badanie koncentruje się szczególnie na określeniu związku między znajomością kluczowych organizacji wspierających rozwój gospodarczy w ramach ekosystemu przedsiębiorczości i dążeniem do wzrostu. Istnieje znaczny dorobek badań na temat ekspansji małych i średnich przedsiębiorstw (MSP), ze względu na znaczenie szybko rosnących MSP dla wzrostu gospodarczego poprzez tworzenie miejsc pracy. W ramach tych badań określono wiele wewnętrznych i zewnętrznych determinantów wpływających na wzrost małych firm. Stwierdzono, że takie cechy przedsiębiorców jak dążenie do wzrostu i działanie w ramach sieci stanowią istotne czynniki w procesie ekspansji. Jednak relacja między procesem wzrostu i działaniem przedsiębiorcy w ramach sieci wymaga pełniejszego zrozumienia. Odwołując się do literatury z zakresu ekosystemu przedsiębiorczości, procesu wzrostu i teorii zależności zasobów, w badaniu zanalizowano wyniki sondażu skierowanego do przedsiębiorstw w regionie Halifax w Nowej Szkocji na terenie Kanady, w latach 2011-2013. Celem badania było określenie relacji między dążeniem przedsiębiorcy do wzrostu i skłonnością do powiązań sieciowych z kluczowymi organizacjami wspierającymi rozwój gospodarczy w ekosystemie przedsiębiorczości. Wyniki potwierdzają założenie, że frakcja przedsiębiorstw, które dążą do wzrostu (tj. do zatrudnienia dodatkowego personelu i wejścia na nowe rynki w ciągu kolejnych 12 miesięcy) jest większa w przypadku przedsiębiorstw wykazujących się znajomością organizacji wspierających rozwój gospodarczy, niż w przypadku przedsiębiorstw, które nie wykazują się tą znajomością. Rezultaty nie są jednak jednolite w całej populacji. Wyniki wskazują ponadto, że im wyższe oczekiwania co do wejścia na nowe rynki w ciągu kolejnych 12 miesięcy, tym większe szanse, że przedsiębiorca wykaże się znajomością kluczowych organizacji rozwoju gospodarczego. Rezultaty badań stanowią wkład do literatury na temat związków między powiązaniami sieciowymi i wzrostem małych przedsiębiorstw.

Słowa kluczowe: *proces wzrostu, mała firma, ekosystem przedsiębiorczości, powiązania sieciowe, Kanada.*

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