

ENTREPRENEURIAL EXPERIENCE AND ENTREPRENEURIAL STRATEGY

Empirical Analysis of the Influence of Entrepreneurial Teams with Academic and Surrogate Entrepreneurs on Entrepreneurial Strategy of Research-based Spin-off Companies in Europe

(Research in Progress)

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Abstract

This study analyses the influence of entrepreneurial experience in research-based spin-off companies (RBSOs) on entrepreneurial strategy, venture development, and firm performance and uses different sources of information. Besides desktop-research a quantitative empirical analysis addressing RBSOs in Europe will be conducted. The first step was a survey asking technology transfer officers at universities and non-university research institutes about RBSOs at their organisations. In cooperation with the University of Antwerp 1.011 institutes in 24 European countries have been contacted leading to a database with 8,505 companies. In the next step an appropriate sample of RBSOs will be selected and asked for the characteristics of the entrepreneurial team and the strategy of the company. Finally, it will include different sources to measure RBSOs' performance. This research-in-progress paper gives an overview about the current status quo of the study. It includes a brief review of the existing literature, introduces the research questions, and discusses a subset of hypotheses as well as the theoretical background and proposed methodology.

Introduction

The commercialisation of research-based technology has become an intensively discussed topic in politics and business as well as in academic networks. Spin-off companies from universities and research institutes are claimed to be important opportunities for commercialising technologies. Beside the conventional route for scientific discoveries to reach the market, through licensing, research-based spin-offs (RBSOs) have become an increasingly popular aspect, especially in the technology transfer process (Di Gregorio & Shane, 2003; Wright, Birley, & Mosey, 2004). In this context an initial question is whether the RBSO has entrepreneurs with appropriate commercial skills to establish profitable ventures if they were engaged in academia before. On the one hand, scientists are typically

the founders of high technology companies, but on the other hand, they often lack managerial and entrepreneurial skills. The entrepreneurship literature discusses the impact of habitual and novice entrepreneurs on new venture performance. Within the field of RBSOs two different approaches can be outlined: (1.) the academic/inventor or (2.) an external/surrogate as entrepreneur of the spin-off (Radosevich, 1995). The academic entrepreneur was usually in the research team developing the technology the RBSO is based on, whereas the surrogate entrepreneur did not belong to the research institute before joining the spin-off (Franklin, Wright, & Lockett, 2001). Most research has paid attention to the academic entrepreneur, but there are only a few studies in the literature which focus on the external entrepreneur. This study contributes to previous research by examining more closely the role of the surrogate entrepreneur in enabling RBSOs to become sustainable, rent generating firms.

Literature review and research questions

In prior studies, RBSOs are defined as new ventures based on the transfer of technology or academic knowledge developed by public research organisations with focus on the commercialisation of research results. In this context RBSOs can be discussed from different perspectives. Despite the increasing attention on the spin-off process and activities (e.g. Smilor, Gibson, & Dietrich, 1990; Roberts & Malone, 1996; Carayannis, Rogers, Kurihara, & Allbritton, 1998) most authors do not give a strict and clear definition of a research-based spin-off.

Pirnay et al. (2003) propose a typology on the basis of two key discriminatory factors. These factors are (1.) the academic status of the individuals which are involved in the new venture and (2.) the kind of knowledge that is transferred. Concerning the academic status a differentiation is made between entrepreneurs with a scientific background like professors or researchers (Mustar, 1997; Clarysse, Wright, Lockett, Van de Velde, & Vohora, 2005) and founders without substantial research experience like students. Spin-offs with a scientific background typically try to commercialise research findings with promising prospects of success. Therefore, in this type of spin-off usually researchers and rarely students are engaged. With regard to the kinds of knowledge on the one hand codified knowledge and on the other hand tacit knowledge can be transferred to the spin-off company. Codified knowledge is usually distinct from the researcher who developed it. Because it relies on formal information like publications or research reports it is easily accessible and can be used or reproduced by other individuals. Tacit knowledge such as experiences or technical expertise, is generally related to the researcher who acquired this kind of knowledge within his academic career.

Mustar et al. (2006) conceptualise a multi-dimensional taxonomy of research-based spin-offs and identify several common characteristics they have with new technology based ventures (NTBFs). On the basis of a literature review of articles on NTBFs published since 1990 they identify three main theoretical research traditions. The first category examines the “institutional perspective” which focuses on the relationship between RBSOs and their parent organisations. Most of this research analyses the influence that the parent institute might have with their decisions, e.g. on the business model of the RBSO (Clarysse et al., 2005; Löfsten & Lindelöf, 2005). The second category of articles pays attention to sectoral differences, technological frameworks, and product market combinations. In this context the term “business model perspective” seems to be appropriate. These papers are mostly more theoretical and descriptive (Chiesa & Piccaluga, 2000), they describe the business activities

developed by NTBFs and in particular by RBSOs. The third group can be labelled as the “resource-based-perspective” (Brush, Greene, & Hart, 2001). This kind of studies focuses on organisational resources and capabilities of a firm as predictors of performance and competitive advantage.

Previous research mostly agrees about the relevance of entrepreneurs and owner-managers as the key resource asset and influence factor for the growth and performance of small companies and new ventures in particular (Bruno, Leidecker, & Harder, 1987; Shane, 2000; Watson, 1995). In this context studies have analysed the characteristics of founders or owner-managers with the entrepreneur as unit of analysis (Davidsson & Wiklund, 2001). According to the literature that examines the human resources of new ventures, primary competencies of RBSOs depend on competencies of the entrepreneurial team (Cooper & Bruno, 1977). For this reason growth and performance of spin-offs are linked very closely to the characteristics of their founders and owner-managers. Particularly, the effect of their previous entrepreneurial experience is attracting more and more interest among entrepreneurship scholars (Chandler & Jansen, 1992; Dyke, Fischer, & Reuber, 1992; Westhead, Ucbasaran, & Wright, 2005). In this discussion an essential differentiation is made between “habitual entrepreneurs” who have previous business-ownership experience and “novice entrepreneurs” who are running their business without any prior entrepreneurial experience (Ucbasaran, Alsos, Westhead, & Wright, 2008).

There is a lack of research addressing the extent of habitual entrepreneurship in companies which emerged from academia (Mosey & Wright, 2007). The university environment implies a couple of constraints for establishing sustainable companies (Vohora, Wright, & Lockett, 2004). On the one hand new technology-based ventures are often challenged by several liabilities such as newness (Stinchcombe, 1965), size (Aldrich & Auster, 1986), adolescence (Brüderl & Schüssler, 1990), uncertainty (Schröder, 2008), and owner dependence (Shane & Stuart, 2002). On the other hand the entrepreneurial team often lacks managerial and entrepreneurial skills to establish profitable ventures since the scientists themselves are typically the founders of high technology companies emerging from academia. Within the field of RBSOs Radosevich (1995) outlines two different approaches: (1.) the academic entrepreneur approach (inventor approach) and (2.) the surrogate entrepreneur approach.

1. An academic entrepreneur is an individual who developed the technology. Although his primary role was that of a lecturer or researcher he takes the role of the entrepreneur in the new venture (Franklin, Wright, & Lockett, 2001).
2. Surrogate entrepreneurship involves an independent and external entrepreneur. This could be either an individual or organisation from outside the research institute that initiated the company. The originator of the technology keeps his position in the research institute (Franklin, Wright, & Lockett, 2001).

There are a few studies examining surrogate entrepreneurship on a theoretical approach that refers to the resource endowments. Radosevich (1995) points out that surrogate entrepreneurs may play an important role in transferring technology. In a theoretical paper he argues that inadequate incentives and support mechanisms for scientists in research institutes may change the focus of the scientist’s activities. He argues that previous entrepreneurial experience and accumulated business knowledge including professional networks, easier access to risk capital, and strategic alliances are advantages of the surrogate-entrepreneur model. Corresponding to a survey of 57 universities in the UK Franklin et al. (2001) figure out that surrogate entrepreneurs could be an important source of commercial knowledge and

skills. Therefore they may increase the chances of success. Shane & Stuart (2002) analysed 134 spin-off companies from the MIT (US). Their main findings are that new ventures with founders who have direct and indirect relationships with venture investors are most likely to receive venture funding. Additionally, they are less likely to fail. They argue that receiving funding is one of the most influential determinants of the likelihood of an IPO. For this reason social capital assets which might be added by external entrepreneurs have a significant impact on fund-raising. Wright et al. (2004) used case-studies of 4 spin-offs in the UK to examine joint ventures with a company from the industry as a kind of external partner. The conclusion of this research is that creating a spin-off as a joint venture could be a helpful way for overcoming resource constraints.

Most attention in prior research concerning the entrepreneurial team in spin-off companies from research institutes has been paid to the inventor as an entrepreneur. The effects of surrogate or habitual entrepreneurs on research-based spin-offs' development and performance has mainly been analysed qualitatively so further quantitative empirical studies are needed. Furthermore, findings in previous research concerning the relationship between prior entrepreneurial and business-ownership experience on firm performance are not consistent (Stuart & Abetti, 1990; Westhead & Wright, 1998). Habitual entrepreneurs do not by default perform better than novice entrepreneurs (Ucbasaran, Westhead, & Wright, 2006), because they may be able to enlarge their knowledge and capabilities, but they can also adopt routines and mindsets which limit the identification of opportunities and the development of the emerging business in a new and changed environment (Starr & Bygrave, 1991). In view of this inconclusive or just weak support for a positive impact of previous entrepreneurial experience on firm performance the point of view of this debate has to be broadened. Hambrick & Mason (1984) discuss the relationship between top management characteristics and the strategic decisions of the company as well as its' organisational outcomes. Although this framework, called "Upper Echelons Theory", was introduced more in the context of large corporations, applying it in an entrepreneurial setting may add an interesting perspective, because it outlines a mediating effect of the characteristics of the management team on firm performance through their strategic choices.

The relationship between strategic planning and firm performance has been extensively discussed within the scope of large corporations, predominantly indicating a positive influence of strategic planning activities (Bracker, Keats, & Pearson, 1988; Schwenk & Shrader, 1993). However, there are not many empirically based quantitative studies which focus on small companies (Kraus, Harms, & Schwarz, 2006). The existing debate about strategic planning in small firms does not agree about the value of planning activities, especially in the context of new emerging ventures. The so called "Planning School" argues that companies generally benefit from formal, systematic planning activities in stable as well as in unstable environments (Ansoff, 1991), so they support the development process and increase survival rates of established and emerging ventures. On the contrary, the "Learning School" states that companies perform better if they remain flexible and keep on learning, especially in unstable environments (Mintzberg, 1991).

In summary, there are not many studies analysing how habitual or surrogate entrepreneurs influence the performance and development of research-based spin-off companies. Previous research indicates inconsistent findings or only weak support for a positive impact of entrepreneurial experience on new venture performance. Furthermore, there are diverging opinions whether formal planning is beneficial for established and emerging small ventures. In the first instance, this study focuses on the relationship between prior entrepreneurial

experience and the intensity of strategic planning activities in research-based spin-off companies. Beyond that it looks at the mediating effect of strategic planning on firm performance. In this context the following research questions are addressed:

1. How do entrepreneurial teams in research-based spin-off companies influence the entrepreneurial strategy?
2. How does the entrepreneurial strategy mediate the effect of entrepreneurial experience on venture performance?

Theoretical background and hypotheses

Within this study the impact of entrepreneurial teams in research-based spin-off companies on entrepreneurial strategy, venture development, and firm performance will be analysed through different theoretical lenses. Firstly, it draws on the resource-based view and human capital theory to explain how initial resources may influence organisational outcomes (Barney, 1991; Wernerfelt, 1984; Becker, 1964). Secondly, effectuation and causation theory is used to explain why ventures emphasize strategic planning activities differently (Sarasvathy, 2001; Read & Sarasvathy, 2005; Wiltbank, Dew, Read, & Sarasvathy, 2006). Finally, this study refers to life-cycle models to outline RBSOs development (Miller & Friesen, 1984; Vohora et al., 2004).

The analysis of predictors of new venture performance has become an important field of entrepreneurship research. A number of studies has pointed out that initial resource stocks may have subsequent influence on organisational performance (Baron & Ensley, 2006). The resource-based view (RBV) considers firms as a set of resources which influence performance and competitive advantage (Barney, 2001). The RBV refers to several different theories of the firm and goes back to Edith Penrose and her work on “The Theory of the Growth of the Firm” (Penrose, 1959). Retrospectively, influential literature in the field of strategic management, e.g. Barnard (1938), Selznick (1957), Chandler (1962), and Rumelt (1974), has discussed the contribution of internal competencies to the performance of a firm. Therefore, these studies already incorporate a resource-based perspective (Conner, 1991). As one of the first authors, Wernerfelt (1984) outlines the theory of the resource-based view of the firm with a coherent description and notes, “For the firm, resources and products are two sides of the same coin” (pp. 171). In this context, the ability of a venture to keep its competitive position in a market depends on important resources rather than on a specific product market combination.

A resource-based approach places emphasis on attributes of the venture which are costly-to-copy and reside within the organisation. Barney (1991) suggests that this set of resources is significantly responsible for economic rents and therefore affects performance and competitive advantage. In a resource-based view it is generally accepted that companies try to obtain above-normal returns. According to Peteraf (1993) durable competitive advantage with above-normal returns needs resources which are valuable, rare, imperfectly imitable, and not substitutable. Nowadays, the resource-based view is one of the most influential frameworks in strategic management research. Resource categories are: (1.) technological resources, (2.) social resources, (3.) financial resources and (4.) human resources (Barney, 1991; Brush et al., 2001). Borch et al. (1999) use the term “technological resources” to refer to the firm-specific products and technology. RBSOs differ in their degree of innovativeness or scope of technology, they may also vary in their R&D quality and their position in the

product-development cycle. “Social resources” of a company can be defined as its industry and financial contacts (Brush et al., 2001). These social resources may also take into account the network or the social capital of the company (Elfring & Hulsink, 2003; Lee, Lee, & Pennings, 2001). The category “financial resources” includes the amount and type of financing with a distinction made between capital, loans, subsidies, and profits. “Human resources” refer to attributes of the founding team and the personnel, as well as the management team of the venture. Human resources can be measured as: size of the founding team, background of the founders, professional management experience, and organisational size.

Corresponding to the resource-based view literature, idiosyncratic internal resources implicate a sustainable competitive advantage. In the context of RBSO companies the question is, which resources are mainly responsible for these relationships? In the entrepreneurship field a series of articles identify the founders and their characteristics having an essential impact on RBSO performance and competitive advantage (e.g. Brüderl, Preisendörfer, & Ziegler, 1992; Brüderl & Preisendörfer, 2000; Chandler & Jansen, 1992). Although the discussions about the contributions of individual attributes comprise different arguments and opinions, a number of prior studies (e.g. Wernerfelt, 1984; Barney, 1991; Dierickx & Cool, 1989; Peteraf, 1993; Collis, 1994; Teece, Pisano, & Shuen, 1997) emphasize the role of the management team in identifying and exploiting profitable opportunities. Already Penrose (1959) perceived the weight of “unique managerial talent that is inimitable” (Rugman & Verbeke, 2002, p. 770) and distinguishes between entrepreneurial and managerial competences.

This study will explore the effects of initial resource endowments on the performance of RBSOs. It will concentrate on the human capital argument – especially the contribution of entrepreneurial teams with surrogate and academic entrepreneurs. The emergence of human capital theory was driven by the intention to analyse how individual investments of employees in training, education, knowledge, and experience improve their personal incomes (Becker, 1964). Scholars from the entrepreneurship field have used human capital theory in order to explain varying performance levels of new emerging ventures, e.g. compared to more mature companies which are already established in the market. Meanwhile, a substantial number and variety of different measures have been established such as formal qualification, work experience, and other kinds of knowledge and capabilities. In the context of young enterprises task-related variables like entrepreneurial, industry or ownership-experience have been discussed as being key assets for new venture performance and development (e.g. Florin, Lubatkin, & Schulze, 2003; Sexton & Bowman, 1985). According to human capital theory individuals can develop their capabilities leading to higher efficiency and productiveness if they acquire a wide range of human capital resources (Becker, 1975).

Based on a meta-analysis of 70 different studies Unger et al. (forthcoming) identify a significant positive correlation between human capital and entrepreneurial success. Although only a weak impact could be found the effect size is comparable to the relationship between formal planning and success in small companies (Brinckmann, Grichnik, & Kapsa, 2010). There might be several reasons why the link between human capital and entrepreneurial success is not as strong as the considerable amount of articles in the entrepreneurship literature may suggest. On the one hand contingency theory claims that the environmental situation of a company has to be taken into consideration and that so called “contingency factors” may also influence the relationship between human capital variables and performance measures (Lawrence & Lorsch, 1967). An external factor can be the situation of

the industry sector the company operates in. Human capital has been discussed to be more important in high-tech than in low-tech industries, because special knowledge and research expertise are crucial factors for developing new technologies (Khandwalla, 1976). As an internal factor the maturity of the company has to be mentioned, because emerging ventures have to cope with the liability of newness (Stinchcombe, 1965), thus superior human capital assets are supposed to be essentially beneficial for new companies (Davidsson & Honig, 2003). On the other hand human capital may have only in the long run a significant influence on venture performance, because this relationship is mediated by other factors such as company strategy (Baum, Locke, & Smith, 2001).

In principal, the literature differentiates between general and specific human capital (Becker, 1975). Whereas general human capital can be useful in a broader sense specific human capital refers to competences and skills which are connected to a specific context. Education and managerial work experience are important indicators of general human capital (Cooper, Gimeno-Gascon, & Woo, 1994; Castanias & Helfat, 2001), but not necessarily related to entrepreneurial knowledge and skills. Business ownership experience as a form of explicit entrepreneurial experience can certainly add to specific human capital in the entrepreneurship-context (Gimeno, Folta, Cooper, & Woo, 1997; Stuart & Abetti, 1990). Habitual entrepreneurs with previous business ownership experience are argued to have acquired specific entrepreneurial human capital which influences their behaviour and performance (Ucbasaran et al., 2008). In contrast to novice entrepreneurs they can link their strategic and operational decisions to prior experiences like experts in a certain field. Therefore, they are more likely to rely on intuitive reasoning, to apply heuristic-based logic, or to gather information in a more flexible and selective approach, especially in a dynamic and uncertain environment (Spence & Brucks, 1997; Mitchell et al., 2007). Furthermore, experienced entrepreneurs tend to make faster decisions (Forbes, 2005). On the contrary, novice entrepreneurs without any prior entrepreneurial experience do not have these kind of reference points, thus they act and search for information more systematically and analytically (Gustaffson, 2006).

These arguments are supported by effectuation and causation theory which helps to explain why entrepreneurial teams in RBSOs may apply different strategies in order to achieve competitive advantage. On the basis of recent literature in strategic management Wiltbank et al. (2006) frame strategy making in the categories of prediction and control and also differentiate between positioning and construction strategies. While positioning strategies focus on an exogenous environment where business opportunities are given construction strategies view companies within an endogenous environment where opportunities are partly created by the entrepreneur. Rational strategies focus on prediction as central issue in the decision process and try to achieve ex ante defined objectives by influencing and changing present circumstances. On the contrary, adaptive strategies follow a control-oriented logic which might be non-predictive and use available resources in a given setting in order to induce new goals and also new environments. This perspective emphasises events in the future which can be controlled instead of those which can be predicted.

Causation is based on the approach of prediction and effectuation on the approach of control. In this context (Sarasvathy, 2001, p. 245) provides the following definition: “Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means.” If the level of analysis is the firm these means are – according to the resource-based view – equivalent with the physical,

human and organisational resources of the company. These different strategy approaches do not exclude each other, in fact they can be applied simultaneously depending on the specific situation. Read & Sarasvathy (2005) state that an effectual approach concerning strategic decisions of a company may have a positive influence on the performance of new ventures. But further empirical analyses are needed in order to examine precisely in which situations whether the causation or the effectuation approach for strategic decision making is beneficial or unfavourable for companies. Both perspectives are extremely relevant for RBSOs. In contrast to typical start-up firms spin-off companies from universities and research institutes on the one hand rely on high sophisticated research results and cutting edge technology and on the other hand they often start in a very early stage without having placed successfully any products or services on the market or having any experience with customers or suppliers. Dew et al. (2009) conclude that habitual entrepreneurs use more likely effectual logic than novice entrepreneurs.

According to the previous discussion the following hypothesis is formulated:

Hypothesis 1: Entrepreneurial teams with previous entrepreneurial experience emphasize strategic planning activities less than teams without entrepreneurial experience.

The relationship between entrepreneurial experience and strategic planning might be moderated by several other variables. Presumably, the influence of previous entrepreneurial experience is different for established and emerging ventures. New companies are confronted with a higher degree of uncertainty and a lower level of predictability, because they have to build up their businesses so there is no information about the past development and the influence of the environmental situation available (McMullen & Shepherd, 2006). Establishing a new company requires estimations about market, competitors and demand which cannot be proved in advance. Therefore, new firms are more obliged to enforce learning than established companies (Shepherd, Zacharakis, & Baron, 2003). Previous research has figured out that especially in the early phases of venture development successful entrepreneurs emphasize less formal planning activities (Bhide, 2000).

These findings are underpinned by life-cycle or stage model theories which have been discussed extensively in previous research. Studies in this field analyse which changes are required for a company to evolve successfully over a period of time (e.g. Miller & Friesen, 1984; Van de Ven, Hudson, & Schroder, 1984). The success of a new venture depends in a crucial way on the ability of its entrepreneurs to cope with new and different challenges they meet when their business evolves, especially within the scope of research-based high-technology companies. In this context new ventures can grow from start-up with a specific marketable product to a complex organisational system in just a few years. In contrast to more predictable environments growth-related transitions and crises must be handled earlier and faster (Greiner, 1972).

The life-cycle theory suggests that ventures need significant changes in the managerial capabilities of their leaderships as the organisations grow and evolve through different life-cycle stages (Hanks, Watson, Jansen, & Chandler, 1993; Covin & Slevin, 1990). Entrepreneurs who have successfully set up an innovative venture may be not perfectly qualified to lead a company through further phases (Galbraith & Vesper, 1982). Because these stages of evolution differ basically from the founding process entrepreneurs may lack the necessary skills and experiences. The main challenge managing the venture becomes less

entrepreneurial with focus on viability and survival but more administrative with regard to larger organisational systems and even more complex business processes. Scholars have used life-cycle, respectively stage-based models to describe the development of new firms. The literature in this field of research states that organisations face a couple of very similar problems when they grow and become more mature. Concerning this matter entrepreneurs have to change considerably the management as well as structural configurations of their organisations. According to most life-cycle models new ventures develop in a coherent and predictable way through different phases of growth. Within each stage of development there are differing organisational characteristics which imply a number of new challenges and the necessity for different managerial and entrepreneurial qualities (Chandler, 1962; Greiner, 1972; Kazanjian, 1988; Miller & Friesen, 1984).

The life cycle models introduced in prior studies correspond to each other in reference to their basic idea that the growth of new ventures takes place in predictable patterns and distinguishable time periods. These models vary in the number of stages they point out, e. g. three- and four-stage models, up to models with five or even more stages. Greiner (1972) proposed one of the first stage-based models and states that ventures move through five discrete phases. Therefore, firms have to put through significant changes within their organisations before they can successfully manage the following stage. Vohora et al. (2004) point out five phases of development especially spin-off companies are faced with: (1.) research phase, (2.) opportunity framing phase, (3.) preorganisation phase, (4.) reorientation phase, and (5.) sustainable returns phase. Additionally, they identify four critical junctures between these different stages spin-off companies must accomplish to reach the next phase: opportunity recognition, entrepreneurial commitment, credibility, and sustainability.

Life-cycle theorists bring forward the argument that the continuing involvement of the original entrepreneurs in general management activities may be disadvantageous to the success of a venture as it grows. Because the skills of the founding team may not be well suited to manage larger and more established companies, new ventures may need to get professional managers involved in the team to match the required transitions. Hambrick & Crozier (1985) empirically observe that successful ventures are more likely to include experienced managers in the growth phase. On the contrary less successful start-ups are more likely to keep the original founding and managing team.

Concerning the moderating effects on the relationship between entrepreneurial experience and the intensity of strategic planning activities the following hypotheses are stated.

Hypothesis 2a: The relationship between previous entrepreneurial experience and strategic planning activities is positively moderated by the maturity of the company.

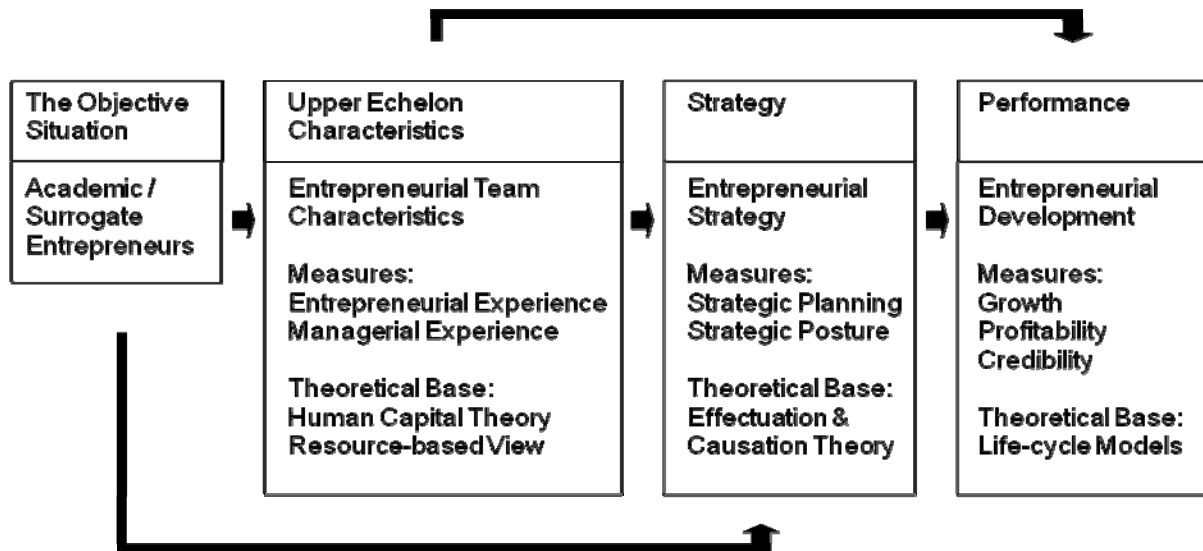
Hypothesis 2b: The relationship between previous entrepreneurial experience and strategic planning activities is positively moderated by the degree of environmental uncertainty.

Proposed Methodology

The upper echelons theory (Hambrick & Mason, 1984) states that the characteristics of top managers have an essential influence on the strategic decisions of a company and furthermore partly affect the organisational outcomes. This study will use this approach as conceptual framework, but apply it on the analysis of the attributes of entrepreneurial teams with

academic and surrogate entrepreneurs. It examines spin-off companies from universities and research institutes in different life-cycle stages and therefore also includes new and small ventures as well as established companies.

Figure 1 Conceptual framework (Hambrick & Mason, 1984)



The target group of this study are research-based spin-off companies from academic organisations across Europe. In order to enable comparability with other studies the main concepts of an academic organisation and a research-based spin-off company need to be clearly specified. On the basis of Pirnay et al. (2003), Clarysse et al. (2005), and Klofsten & Jones-Evans (1996) the following definition is used: “RBSO are new ventures created to exploit commercial knowledge, technology, or research results developed within a research institution.” According to this specification, (1.) the RBSO has the legal structure of a new firm in contrast to an extension or a subsidiary of the research institute, (2.) commercialises scientific knowledge including technological innovations or patents, as well as individual know-how, generated within an academic career, and (3.) has the objective of generating profits with the business idea. This definition includes universities as well as non-university research institutes. Secondly, within this study an academic organisation has been specified as a research institute which is mainly financed by public money. This definition includes predominantly universities, but covers also universities for applied science as well as colleges as long as they are engaged in research activities. Furthermore, the study considers non-university research organisations such as the Max-Planck Gesellschaft in Germany or the Inter-university Micro-Electronics Centre (IMEC) in Belgium.

Because there is no existing public database about spin-offs in Europe available this study needs to look at the overall spin-off population at first. Therefore, a survey has been conducted in cooperation with the University of Antwerp (Prof. Dr. Johan Braet and PhD-Candidate Sven De Cleyn) and has addressed the question how many spin-off ventures originated from universities and non-university research organisations from 1985 till 2008. Intensive desktop-research on websites and databases has gathered information about 1,011 academic organisations and collected contact details of potential respondents – either directors or technology transfer officers. In sum, 809 academic organisations in 24 European countries have been contacted via an email survey and have been asked for the names of their

spin-offs as well as the corresponding date of foundation, activity status, academic field, industry sector, and the involvement of their parent organisations in the ventures such as equity stake, patent licenses or infrastructure. With an effective response rate of 41.1 % in total 8,505 spin-off companies in 24 European countries have been identified. 86 % of the sample are still active or established whereas 10 % are inactive, deceased or failed. Around 4 % of the ventures are already merged, acquired or sold. A very high percentage of spin-offs were founded in technology based industries (72 %).

After the validation process that proves whether the spin-offs fulfil the necessary requirements according to the used definition in the next step an appropriate sample of RBSOs will be selected and asked for the characteristics of the entrepreneurial team and the strategy of the company. Finally, it will include different sources to measure RBSOs' performance. The empirical analysis of the study will use different sources of information and apply multivariate analyses to test the prepositions underlying the research model. The conceptual framework has been presented on several doctoral workshops and summer schools. Based on the received feedback multiple revisions have been made until now. In the next step a questionnaire has been designed addressing variables and constructs about surrogate and academic entrepreneurship respectively, entrepreneurial experience as well as company strategy, venture development and firm performance. Discussions with experts in the entrepreneurship field and a pre-test with 20 German and Belgium spin-off companies using the key informant approach by addressing a member of the management team has lead to several modifications of the questions and the intended procedure. The main survey will be conducted and preliminary results available in the first half of the year 2010. The study will contribute to existing literature in several ways. First, it will contribute to the entrepreneurship literature by focussing on the entrepreneurial teams and their impact on new venture strategy, development, and performance. Second, it will apply human capital theory with regard to different life-cycle stages. Third, it will broaden the upper echelons perspective by analysing especially small and new ventures. Finally, it will empirically test effectuation and causation theory by comparing venture strategies in early and later stages.

References

- Aldrich, H., & Auster, E. R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in Organizational Behavior*, 8, 165-198.
- Ansoff, H. I. (1991). Critique of Henry Mintzberg's 'the design school: Reconsidering the basic premises of strategic management'. *Strategic Management Journal*, 12(6), 449-461.
- Barnard, C. (1938). *The functions of the executives* Harvard University Press.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Barney, J. B. (2001). Is the resource-based 'view' a useful perspective for strategic management research? yes. *Academy of Management Review*, 26(1), 41.
- Baron, R. A., & Ensley, M. D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. *Management Science*, 52(9), 1331-1344.
- Baum, J. R., Locke, E. A., & Smith, K. G. (2001). A multidimensional model of venture growth. *The Academy of Management Journal*, 44(2), 292-303.
- Becker, G. S. (1964). *Human capital*. New York: Columbia University Press.
- Becker, G. S. (1975). *Human capital*. New York: National Bureau of Economic Research.

- Bhide, A. V. (2000). *The origin and evolution of new businesses*. New York, NY: Oxford University Press.
- Borch, O. J., Huse, M., & Senneseth, K. (1999). Resource configuration, competitive strategies, and corporate entrepreneurship: An empirical.. *Entrepreneurship: Theory & Practice*, 24(1), 51-72.
- Boyd, B. K., & Reuning-Elliott, E. (1998). A measurement model of strategic planning. *Strategic Management Journal*, 19(2), 181.
- Bracker, J. S., Keats, B. W., & Pearson, J. N. (1988). Planning and financial performance among small firms in a growth industry. *Strategic Management Journal*, 9(6), 591-603.
- Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms. *Journal of Business Venturing*, 25(1), 24-40.
- Brüderl, J., & Preisendörfer, P. (2000). Fast-growing businesses. *International Journal of Sociology*, 30, 45-70.
- Brüderl, J., Preisendörfer, P., & Ziegler, R. (1992). Survival chances of newly funded business organizations. *American Sociological Review*, (57), 227-242.
- Brüderl, J., & Schüssler, R. (1990). Organizational mortality: The liabilities of newness and adolescence. *Administrative Science Quarterly*, 35(3), 530-547.
- Bruno, A. V., Leidecker, J. K., & Harder, J. W. (1987). Why firms fail. *Business Horizons*, 30(2), 50.
- Brush, C. G., Greene, P. G., & Hart, M. M. (2001). From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base. *Academy of Management Executive*, 15(1), 64-78.
- Carayannis, E. G., Rogers, E. M., Kurihara, K., & Allbritton, M. M. (1998). High-technology spin-offs from government R&D laboratories and research universities. *Technovation*, 18(1), 1-11.
- Castanias, R. P., & Helfat, C. E. (2001). The managerial rents model: Theory and empirical analysis. *Journal of Management*, 27(6), 661-678.
- Chandler, A. D. (1962). *Strategy and structure*. Cambridge: The MIT Press.
- Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. Causation and effectuation processes: A validation study. *Journal of Business Venturing*,
- Chandler, G. N., & Hanks, S. H. (1993). Measuring the performance of emerging businesses: A validation study. *Journal of Business Venturing*, 8(5), 391-408.
- Chandler, G. N., & Jansen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business Venturing*, 7(3), 223-236.
- Chiesa, V., & Piccaluga, A. (2000). Exploitation and diffusion of public research: The case of academic spin-off companies in Italy. *R&D Management*, 30(4), 329.
- Clarysse, B., Wright, M., Lockett, A., Van de Velde, E., & Vohora, A. (2005). Spinning out new ventures: A typology of incubation strategies from European research institutions. *Journal of Business Venturing*, 20(2), 183-216.
- Collis, D. J. (1994). Research note: How valuable are organizational capabilities? *Strategic Management Journal*, 15(8), 143-152.
- Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm? *Journal of Management*, 17(1), 121-154.
- Cooper, A. C., & Bruno, A. V. (1977). Success among high-technology firms. *Business Horizons*, 20(2), 16.
- Cooper, A. C., Gimeno-Gascon, F. J., & Woo, C. Y. (1994). Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing*, 9(5), 371-395.

- Covin, J. G., & Slevin, D. P. (1990). New venture strategic posture, structure, and performance: An industry life cycle analysis. *Journal of Business Venturing*, 5(2), 123-135.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301-331.
- Davidsson, P., & Wiklund, J. (2001). Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future. *Entrepreneurship: Theory & Practice*, 25(4), 81.
- Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of Business Venturing*, 24(4), 287-309.
- Di Gregorio, D., & Shane, S. (2003). Why do some universities generate more start-ups than others? *Research Policy*, 32(2), 209-227.
- Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35(12), 1504-1511.
- Dyke, L. S., Fischer, E. M., & Reuber, R. (1992). An inter-industry examination of the impact of owner experience on firm performance. *Journal of Small Business Management*, 30(4), 72-87.
- Elfring, T., & Hulsink, W. (2003). Networks in entrepreneurship: The case of high-technology firms. *Small Business Economics*, 21(4), 409-422.
- Florin, J., Lubatkin, M., & Schulze, W. (2003). A social capital model of high-growth ventures. *Academy of Management Journal*, 46(3), 374-384.
- Forbes, D. P. (2005). Are some entrepreneurs more overconfident than others? *Journal of Business Venturing*, 20(5), 623-640.
- Franklin, S. J., Wright, M., & Lockett, A. (2001). Academic and surrogate entrepreneurs in university spin-out companies. *Journal of Technology Transfer*, 26(1-2), 127-141.
- Galbraith, J., & Vesper, K. (1982). The stages of growth. *Journal of Business Strategy*, 3(1), 70.
- Gimeno, J., Folta, T. B., Cooper, A. C., & Woo, C. Y. (1997). Survival of the fittest? entrepreneurial human capital and the persistence of underperforming firms. *Administrative Science Quarterly*, 42(4), 750-783.
- Greiner, L. E. (1972). Evolution and revolution as organizations grow. *Harvard Business Review*, 50(4), 37-46.
- Gustaffson, V. (2006). *Entrepreneurial decision-making: Individuals, tasks and cognitions*. Northampton, MA and Cheltenham: Edward Elgar.
- Hambrick, D. C., & Crozier, L. M. (1985). Stumblers and stars in the management of rapid growth. *Journal of Business Venturing*, 1(1), 31-45.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193-206.
- Hanks, S. H., Watson, C. J., Jansen, E., & Chandler, G. N. (1993). Tightening the life-cycle construct: A taxonomic study of growth stage configurations in high-technology organizations. *Entrepreneurship: Theory & Practice*, 18(2), 5-30.
- Kazanjian, R. K. (1988). Relation of dominant problems to stages growth in technology-based new ventures. *Academy of Management Journal*, 31(2), 257-279.
- Khandwalla, P. N. (1976). Some top management styles, their context and performance. *Organization and Administrative Sciences*, 7(4), 21-51.
- Klofsten, M., & Jones-Evans, D. (1996). Stimulation of technology-based small firms—A case study of university-industry cooperation. *Technovation*, 16(4), 187-193.

- Knight, D., Pearce, C. L., Smith, K. G., Olian, J. D., Sims, H. P., Smith, K. A., et al. (1999). Top management team diversity, group process, and strategic consensus. *Strategic Management Journal*, 20(5), 445.
- Kraus, S., Harms, R., & Schwarz, E. J. (2006). Strategic planning in smaller enterprises - new empirical findings. *Management Research News*, 29(6), 334-344.
- Lawrence, P., & Lorsch, J. (1967). *Organization and environment*. Cambridge, MA: Harvard University Press.
- Lee, C., Lee, K., & Pennings, J. M. (2001). Internal capabilities, external networks, and performance: A study on technology-based ventures. *Strategic Management Journal*, 22(6), 615.
- Löfsten, H., & Lindelöf, P. (2005). R&D networks and product innovation patterns—academic and non-academic new technology-based firms on science parks. *Technovation*, 25(9), 1025-1037.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1), 132-152.
- Miller, D., & Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management Science*, 30(10), 1161-1183.
- Mintzberg, H. (1991). Learning 1, planning 0 reply to igor ansoff. *Strategic Management Journal*, 12(6), 463-466.
- Mitchell, R. K., Busenitz, L. W., Bird, B., Marie Gaglio, C., McMullen, J. S., Morse, E. A., et al. (2007). The central question in entrepreneurial cognition research 2007. *Entrepreneurship: Theory & Practice*, 31(1), 1-27.
- Mosey, S., & Wright, M. (2007). From human capital to social capital: A longitudinal study of technology-based academic entrepreneurs. *Entrepreneurship: Theory & Practice*, 31(6), 909-935.
- Mustar, P. (1997). How french academics create hi-tech companies: The conditions for success or failure. *Science and Public Policy*, 24(1), 37-43.
- Mustar, P., Renault, M., Colombo, M. G., Piva, E., Fontes, M., Lockett, A., et al. (2006). Conceptualising the heterogeneity of research-based spin-offs: A multi-dimensional taxonomy. *Research Policy*, 35(2), 289-308.
- Patzelt, H., zu Knyphausen-Aufseß, D., & Fischer, H. T. (2009). Upper echelons and portfolio strategies of venture capital firms. *Journal of Business Venturing*, 24(6), 558-572.
- Penrose, E. G. (1959). *The theory of the growth of the firm*. New York: Wiley.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3), 179-191.
- Pirnay, F., Surlémont, B., & Nlemvo, F. (2003). Toward a typology of university spin-offs. *Small Business Economics*, 21(4), 355-369.
- Radosevich, R. (1995). A model for entrepreneurial spin-offs from public technology sources. *International Journal of Technology Management*, 10(7/8), 879-893.
- Read, S., & Sarasvathy, S. D. (2005). Knowing what to do and doing what you know: Effectuation as a form of entrepreneurial expertise. *Journal of Private Equity*, 9(1), 45-62.
- Roberts, E. B., & Malone, D. E. (1996). Policies and structures for spinning off new companies from research and development organizations. *R and D Management*, 26(1), 17-48.
- Rugman, A. M., & Verbeke, A. (2002). Edith penrose's contribution to the resource-based view of strategic management. *Strategic Management Journal*, 23(8), 769.
- Rumelt, R. P. (1974). *Strategy, structure and economic performance*. Cambridge: Harvard University Press.

- Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243-263.
- Schwenk, C. B., & Shrader, C. B. (1993). Effects of formal strategic planning on financial performance in small firms: A meta-analysis. *Entrepreneurship: Theory & Practice*, 17(3), 53-64.
- Selznick, P. (1957). *Leadership in administration*. New York: Harper & Row.
- Sexton, D. L., & Bowman, N. (1985). The entrepreneur: A capable executive and more. *Journal of Business Venturing*, 1(1), 129-140.
- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11(4), 448.
- Shane, S., & Stuart, T. (2002). Organizational endowments and the performance of university start-ups. *Management Science*, 48(1), 154-170.
- Shepherd, D. A., Zacharakis, A., & Baron, R. A. (2003). VCs' decision processes: Evidence suggesting more experience may not always be better. *Journal of Business Venturing*, 18(3), 381-401.
- Shrader, R., & Siegel, D. S. (2007). Assessing the relationship between human capital and firm performance: Evidence from technology-based new ventures. *Entrepreneurship: Theory & Practice*, 31(6), 893-908.
- Smilor, R. W., Gibson, D. V., & Dietrich, G. B. (1990). University spin-out companies: Technology start-ups from UT-austin. *Journal of Business Venturing*, 5(1), 63-76.
- Spence, M. T., & Brucks, M. (1997). The moderating effects of problem characteristics on experts' and novices' judgments. *Journal of Marketing Research (JMR)*, 34(2), 233-247.
- Starr, J., & Bygrave, W. D. (1991). The assets and liabilities of prior start-up experience: An exploratory study of multiple venture entrepreneurs. In N. C. Churchill, et al. (Eds.), *Frontiers of entrepreneurship research 1991* (pp. 213-227). Wellesley, MA: Babson College.
- Stinchcombe, A. L. (1965). Social structures and organizations. In James G. March (Ed.), *Handbook of organizations* (pp. 142-193). Chicago: Rand-McNally.
- Stuart, R. W., & Abetti, P. A. (1990). Impact of entrepreneurial and management experience on early performance. *Journal of Business Venturing*, 5(3), 151-162.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Ucbasaran, D., Westhead, P., & Wright, M. (2006). *Habitual entrepreneurs*. Aldershot, UK: Edward Elgar.
- Ucbasaran, D., Alsos, G. A., Westhead, P., & Wright, M. (2008). *Habitual entrepreneurs*. Boston - Delft:
- Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing, In Press, Corrected Proof*
- Van de Ven, A. H., Hudson, R., & Schroder, D. M. (1984). Designing new business start-Up's entrepreneurial, organizational, and ecological considerations. *Journal of Management*, 10, 87-107.
- Vohora, A., Wright, M., & Lockett, A. (2004). Critical junctures in the development of university high-tech spinout companies. *Research Policy*, 33(1), 147-175.
- Watson, T. J. (1995). Entrepreneurship and professional management: A fatal distinction. *International Small Business Journal*, 13(2), 34-46.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180.

- Westhead, P., Ucbasaran, D., & Wright, M. (2005). Decisions, actions, and performance: Do novice, serial, and portfolio entrepreneurs differ? *Journal of Small Business Management*, 43(4), 393-417.
- Westhead, P., & Wright, M. (1998). Novice, portfolio, and serial founders: Are they different? *Journal of Business Venturing*, 13(3), 173-204.
- Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? the case for non-predictive strategy. *Strategic Management Journal*, 27(10), 981-998.
- Wright, M., Birley, S., & Mosey, S. (2004). Entrepreneurship and university technology transfer. *Journal of Technology Transfer*, 29(3-4), 235-246.
- Wright, M., Vohora, A., & Lockett, A. (2004). The formation of high-tech university spinouts: The role of joint ventures and venture capital investors. *Journal of Technology Transfer*, 29(3-4), 287-310.